

Identificación precoz y seguimiento de pacientes tratados con CAR-T

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Conflitos de Interés

Speaker's Bureau: Janssen, Roche, Takeda, Abbvie, BMS, Lilly, BeiGene, Astra Zeneca, Abbvie

Educational Support: Janssen, Takeda, Roche, Abbvie

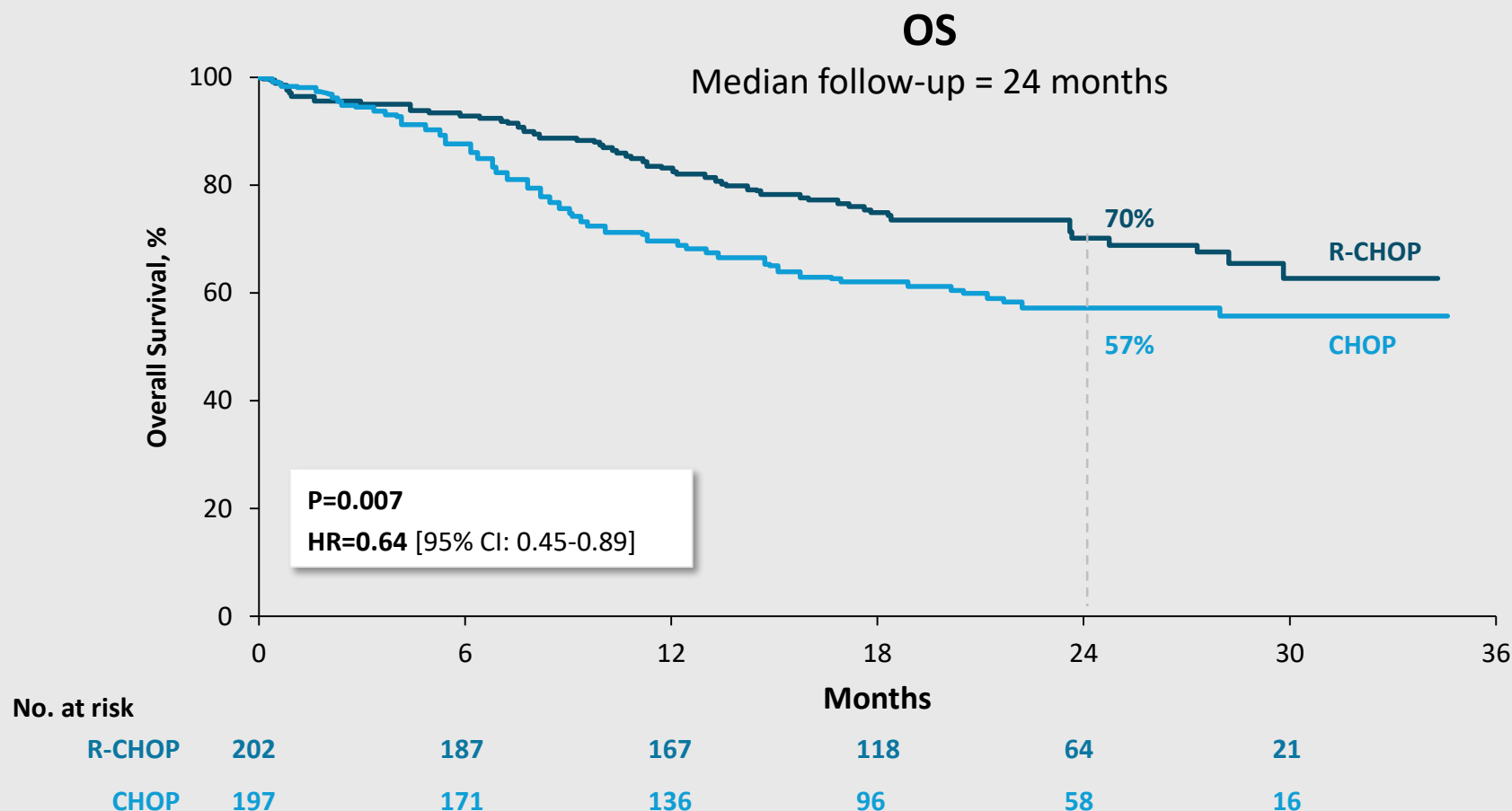
Advisory Board: Janssen, Roche, Abbvie, Astra Zeneca, Takeda

Research: Janssen, Millenium, Merck, BMS, BeiGene, MSD, Abbvie, Lilly, AstraZeneca

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R-CHOP was established as the SoC in 2002 in previously untreated patients age 60-80 years with DLBCL



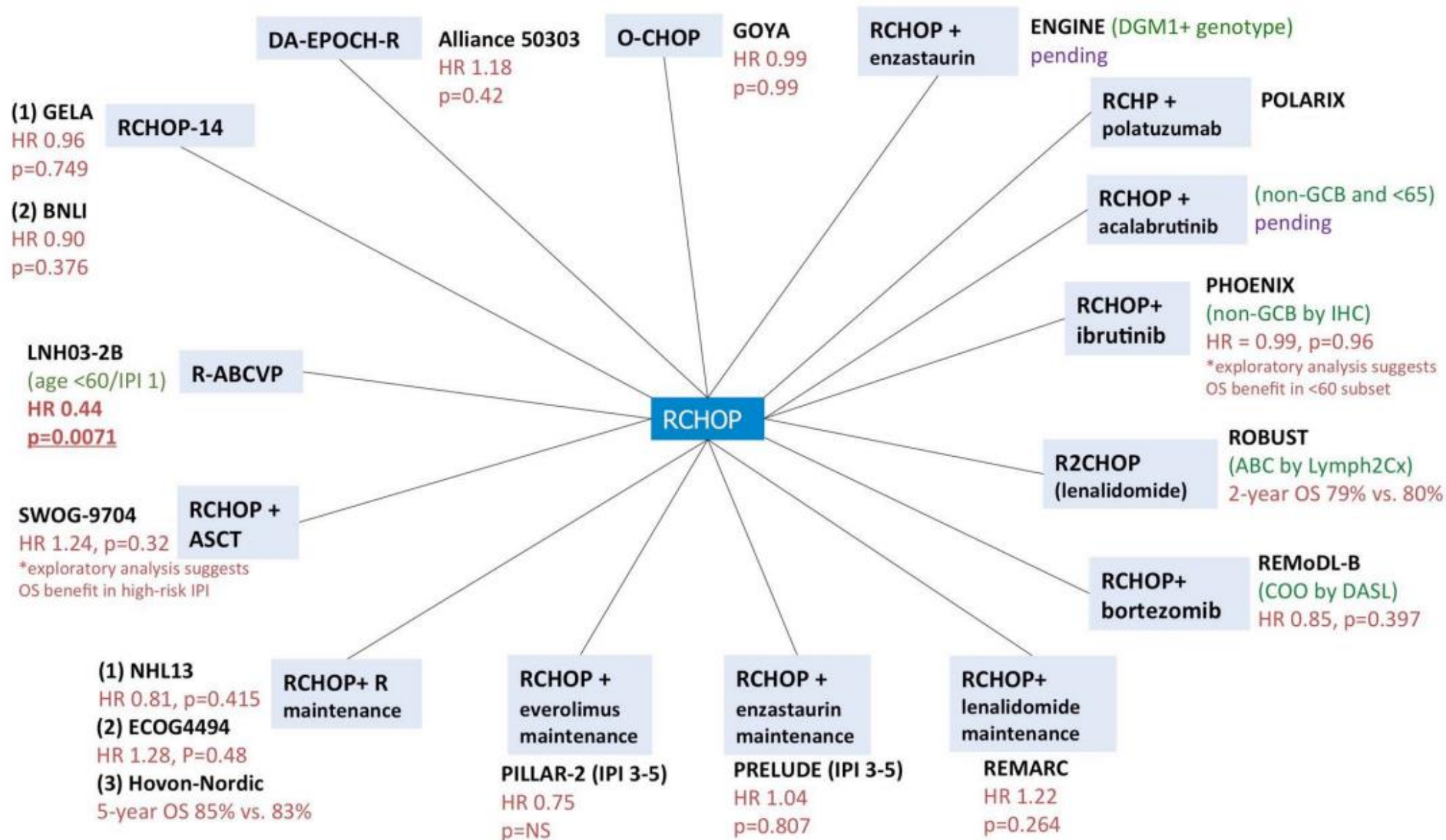
Response	R-CHOP	CHOP
ORR	82%	69%
CR	52%	37%
uCR	23%	26%
PR	7%	6%



Safety	R-CHOP	CHOP
Grade 3/4 AEs		
Infection	12%	20%
Lung toxicity	8%	11%
Neurologic toxicity	5%	9%
No difference in SAEs		

AE, Adverse Event; CHOP, Cyclophosphamide, Doxorubicin Hydrochloride, Vincristine Sulfate, Prednisone; CI, Confidence Interval; CR, Complete Response; DLBCL, Diffuse Large B-cell Lymphoma; HR, Hazard Ratio; Mo, Months; No, Number; ORR, Overall Response Rate; OS, Overall Survival; R-CHOP, Rituximab-CHOP; SAE, Serious AE; SoC, Standard Of Care; uCR, Unconfirmed CR.

Adapted from Coiffier B, et al. N Engl J Med. 2002;346(4):235-42.

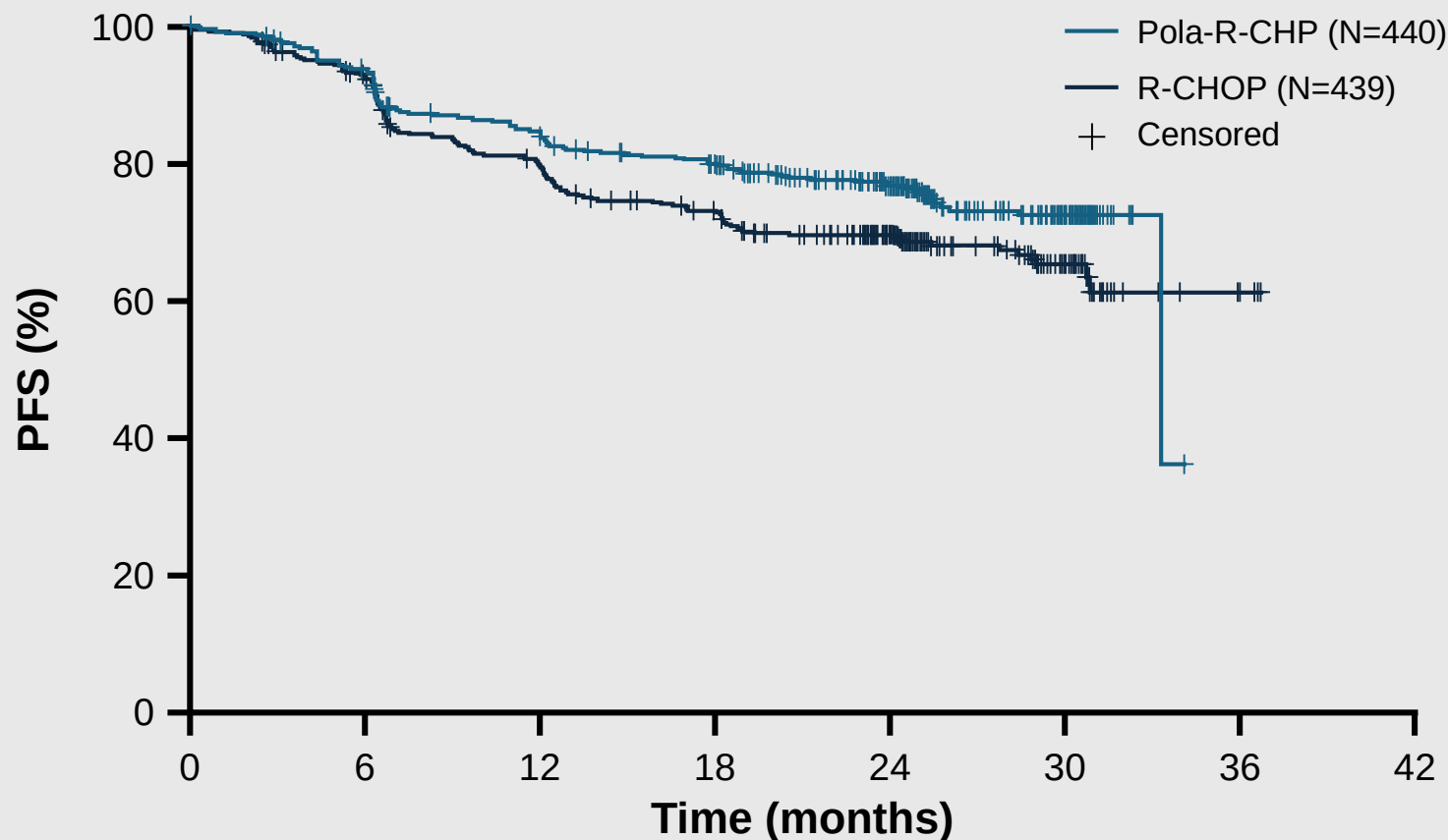


POLARIX Primary Endpoint: Progression-Free Survival

INITIAL ANALYSIS



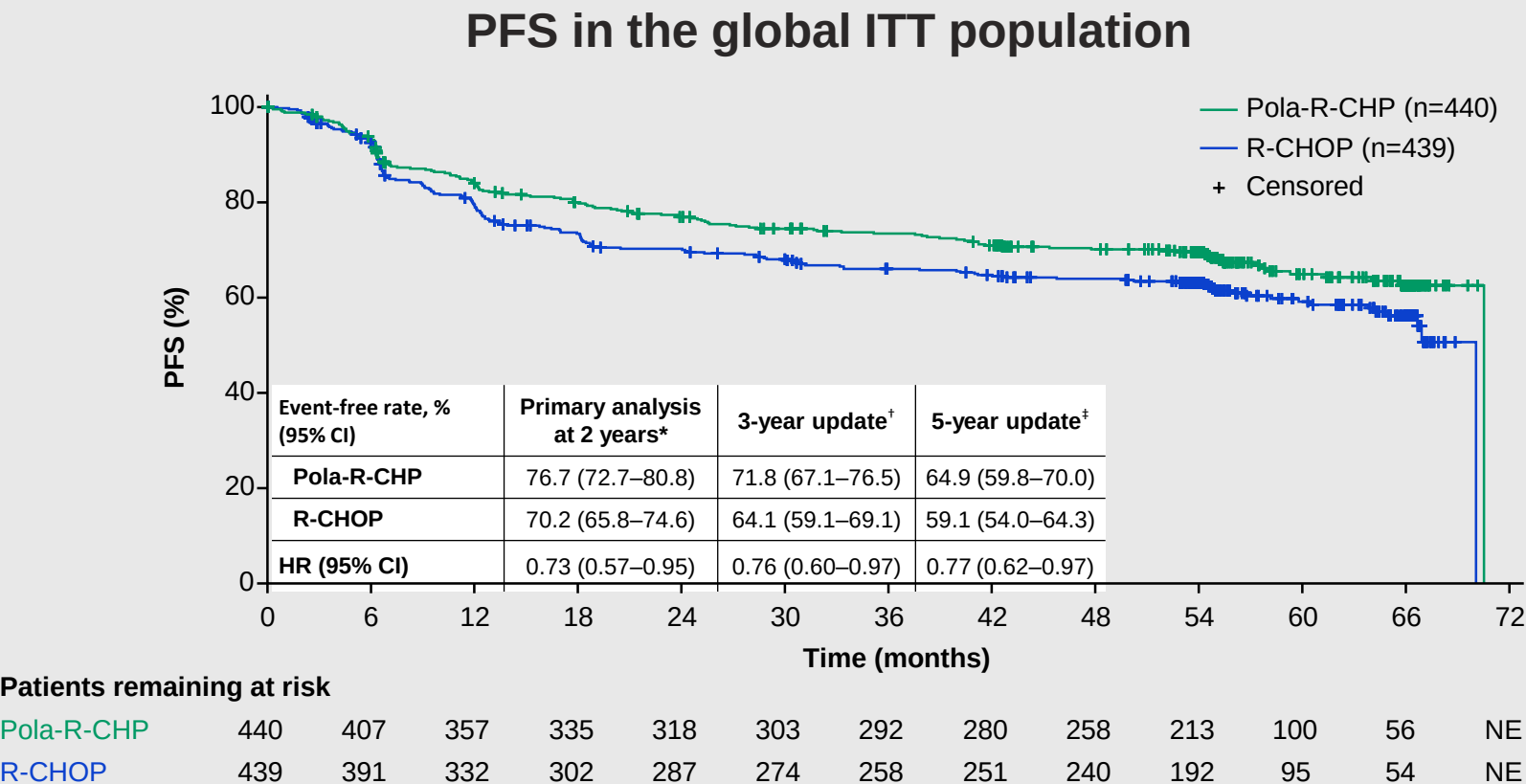
Pola-R-CHP Significantly Improved PFS Versus R-CHOP



ITT population. Data cut-off: June 28, 2021; median 28.2 months' follow-up.
NE, not evaluable.

Tilly H et al. *N Engl J Med*. 2022;386(4):351-363.

Initial PFS benefit of Pola-R-CHP over R-CHOP is maintained at 5 years



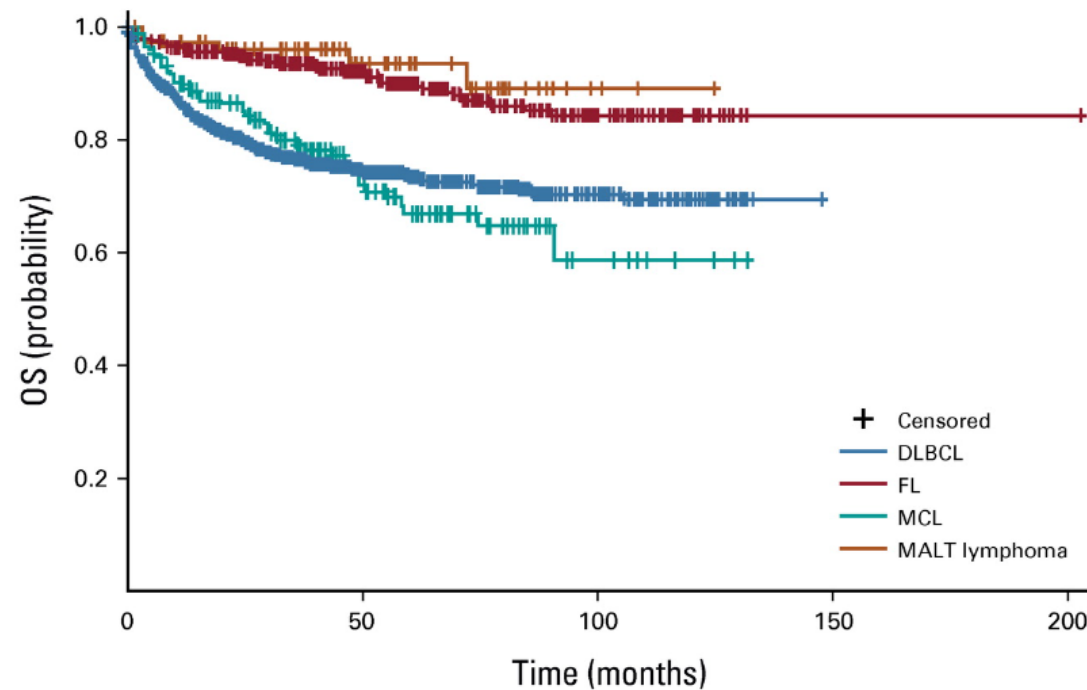
At the 5-year follow up, Pola-R-CHP had a **sustained and significant PFS benefit**, confirming results from the primary analysis of PFS at 2 years of follow up (HR 0.73).¹

*Data cut-off: June 28, 2021; [†]Data cut-off: June 15, 2022; [‡]Data cut-off: July 5, 2024.
CI, confidence interval; HR, hazard ratio; NE, not evaluable.

Pero no todos se curan...



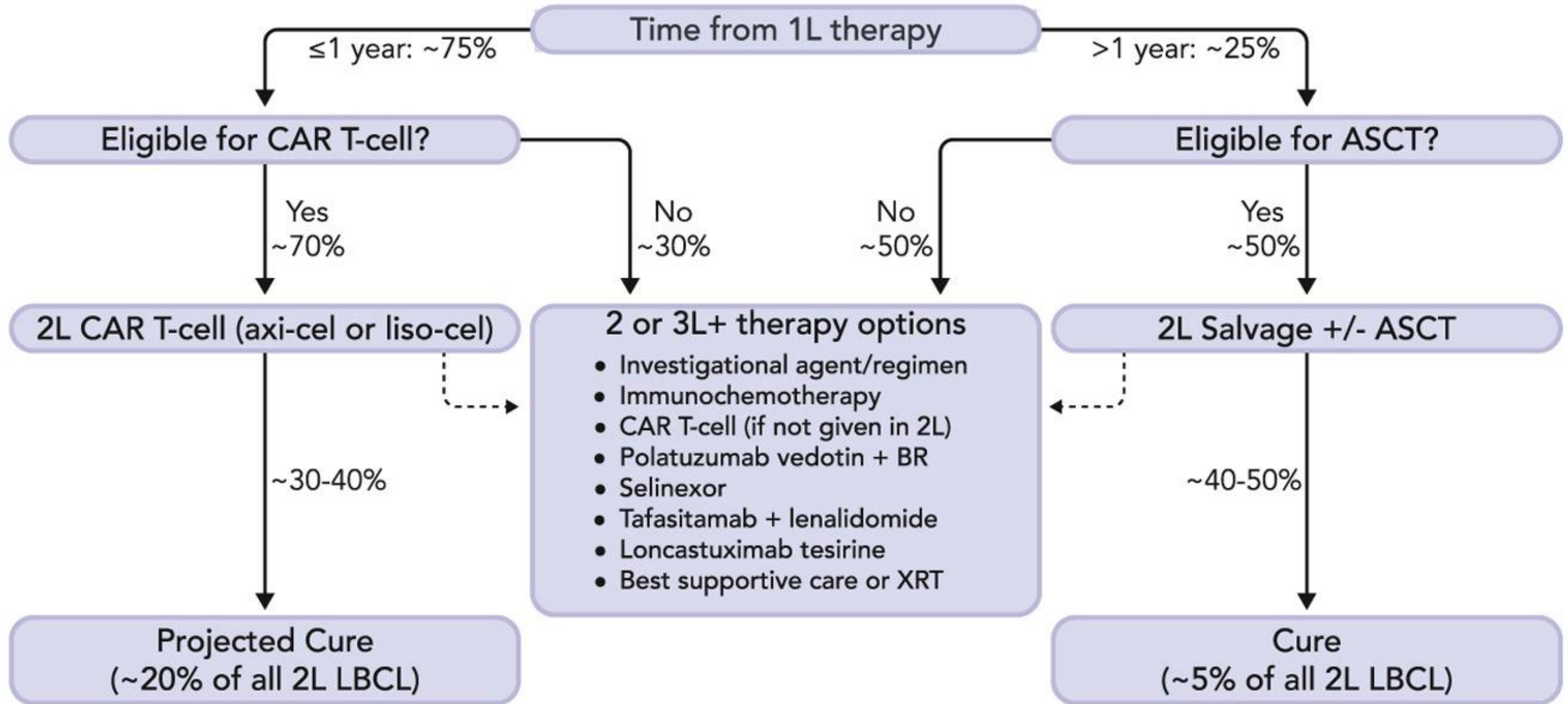
Miguel Pavlovsky, JGO 2022



No. at risk:					
DLBCL	1,387	497	100	0	
FL	544	284	65	1	1
MCL	172	70	8	0	
MALT lymphoma	77	34	3	0	

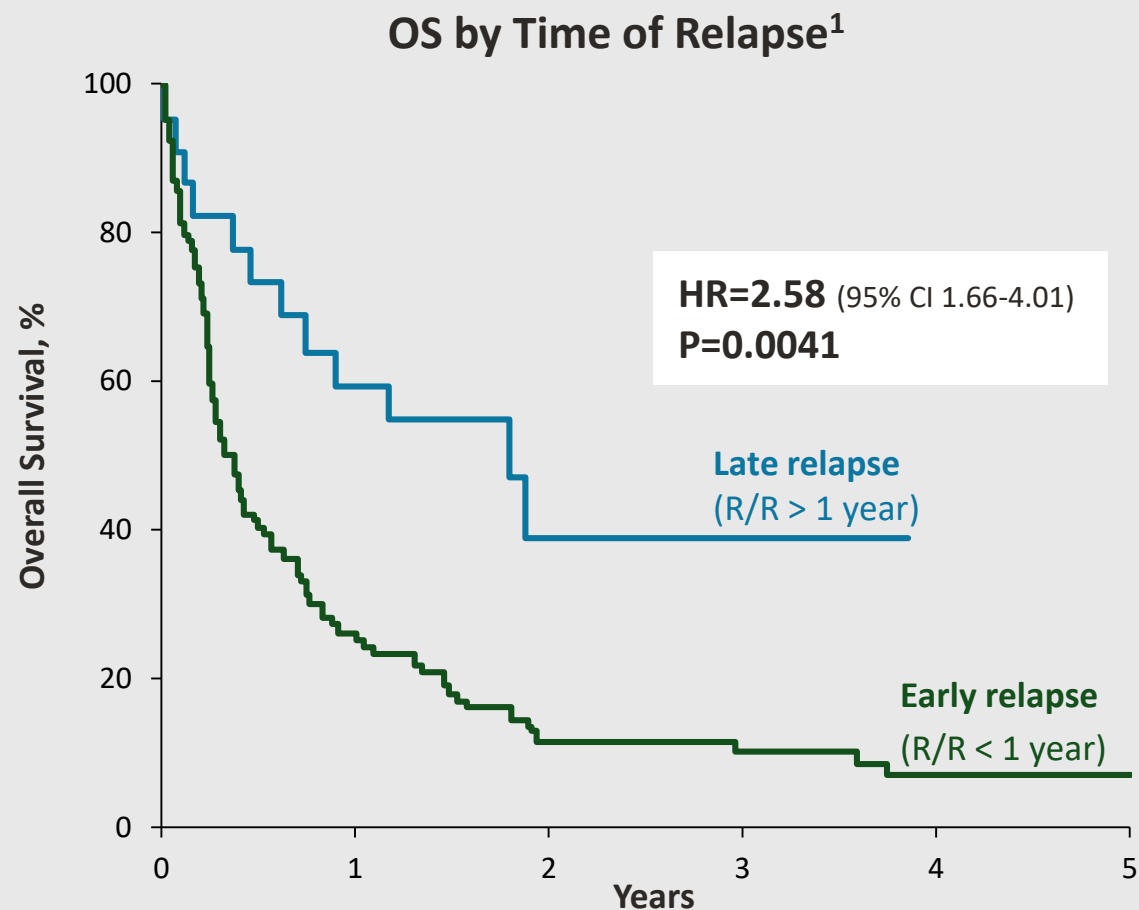
5-Year Survival Rate (%)	DLBCL	FL	MCL	MALT	Burkitt
Overall	69	87.6	57.1	90.8	55.7
Argentina	72.6	86.6	66.5	100	69.3
Brazil	50.8	71.3	35.4	92.3	57.1
Chile	81.7	87.3	38.1	75	NA
Colombia	62.1	96.1	75.1	91.7	47.6
Mexico	71.7	95.3	75.7	92.9	0
Panama and Guatemala	93.8	93.3	85.7	NA	NA

Algorithm for Second-line Therapy of LBCL





Time to relapse after first-line treatment is an important prognostic factor



~25% of patients experience late relapse, relapsing greater than 1 year from initial therapy, and should be considered for **ASCT if transplant-eligible**.^{2,3}

~75% of patients experience early relapse, relapsing within 1 year of completion of initial therapy, and should be considered for **CAR T-cell therapy if eligible**.³

Patients who relapse more than 1 year after first-line treatment have better outcomes than those who relapse within 1 year, however, 3-year overall survival is less than 50% in either group.¹

ASCT, Autologous Stem-Cell Therapy; CAR T, Chimeric Antigen Receptor T-Cell; CI, Confidence Interval; HR, Hazard Ratio; LBCL, Large B-Cell Lymphoma; OS, Overall Survival; R/R, Relapse/Refractory.

Adapted from 1. Puckrin R, et al. *Transplantation and Cellular Therapy*, 28(4), 218-e1. 2. Nastoupil L, Bartlett N. *J Clin Oncol*. 2022;41:903-91. 3. Westin J, Sehn LH. *Blood*. 2022;139(18):2737-2746.

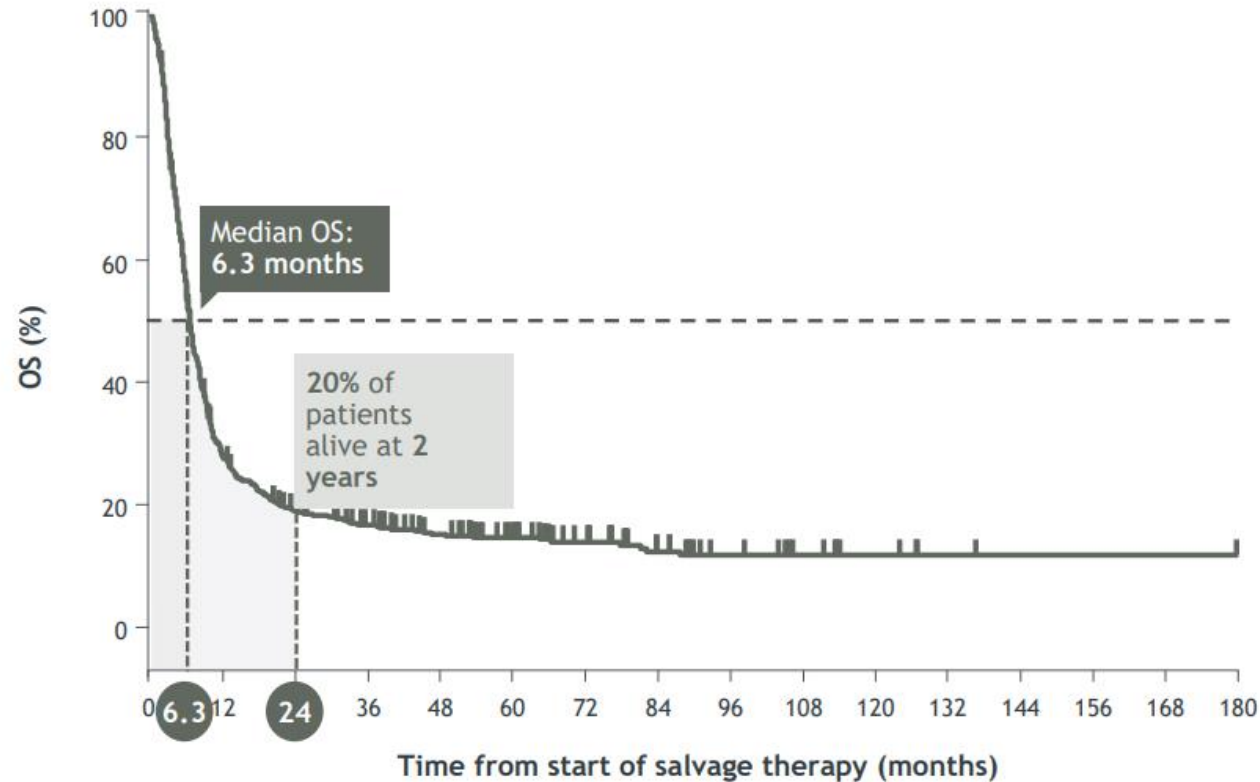
No response or early relapse in 1L DLBCL correlates with poorer survival outcomes



SCHOLAR-1

Retrospective analysis of outcomes in patients with R/R DLBCL (N=636)

Patients were primary refractory, refractory to ≥ 2 lines of therapy or relapsed ≤ 12 months post ASCT



OS: overall survival

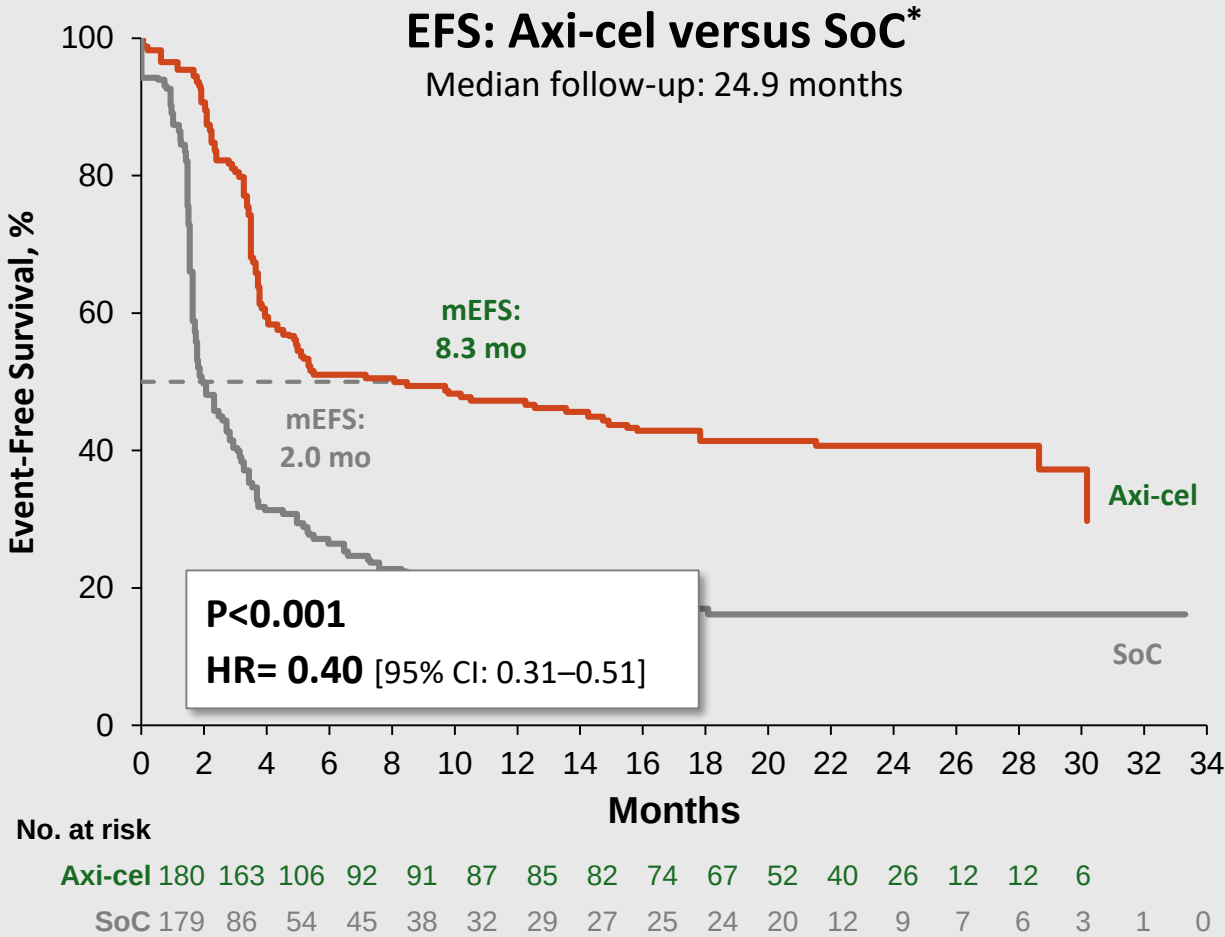
Crump M, et al. *Blood* 2017; 130:1800-1808.

Prior to new therapies,
median OS for patients with
R/R DLBCL was 6.3 months



Axicabtagene ciloleucel

ZUMA-7: Axi-cel versus SoC in R/R DLBCL within 12 mo of R-CHOP



AE, Adverse Event; ASCT, Autologous Stem Cell Transplant; Axi-cel, Axicabtagene Ciloleucel; CAR T, Chimeric Antigen Receptor T-cell; CI, Confidence Interval; CRS, Cytokine Release Syndrome; DLBCL, Diffuse Large B-cell Lymphoma; EFS, Event-Free Survival; GCB, Germinal Center B-cell-like; HR, Hazard Ratio; Gr, Grade; m, Median; SAE, Serious AE; SoC, Standard Of Care.
Adapted from Locke FL, et al. N Engl J Med. 2022;386(7):640-654.

Characteristics	Axi-cel	SoC
GCB subgroup	61%	55%
HGBCL	17%	14%
Primary refractory	74%	73%

Safety	Axi-cel	SoC
Gr3+ AEs >25%		
Neutropenia	69%	41%
Anemia	30%	39%
Leukopenia	29%	22%
SAEs	50%	46%
CRS, any Gr (Gr3+)	92% (6%)	--
Neuro event, any Gr (Gr3+)	60% (21%)	20% (1%)

Bridging therapy: received by **36% of patients** in axi-cel cohort

- dexamethasone ≤40 mg for ≤4 days (no chemotherapy)

Crossover therapy: none, but **56% of patients** from the SoC cohort **received cellular therapies off-protocol**

Received intended CAR T: 94% **Received ASCT (SoC): 36%**

*SoC was two or three cycles of investigator-selected, protocol-defined chemoimmunotherapy, followed by high-dose chemotherapy with autologous stem-cell transplantation in patients with a response to the chemoimmunotherapy.

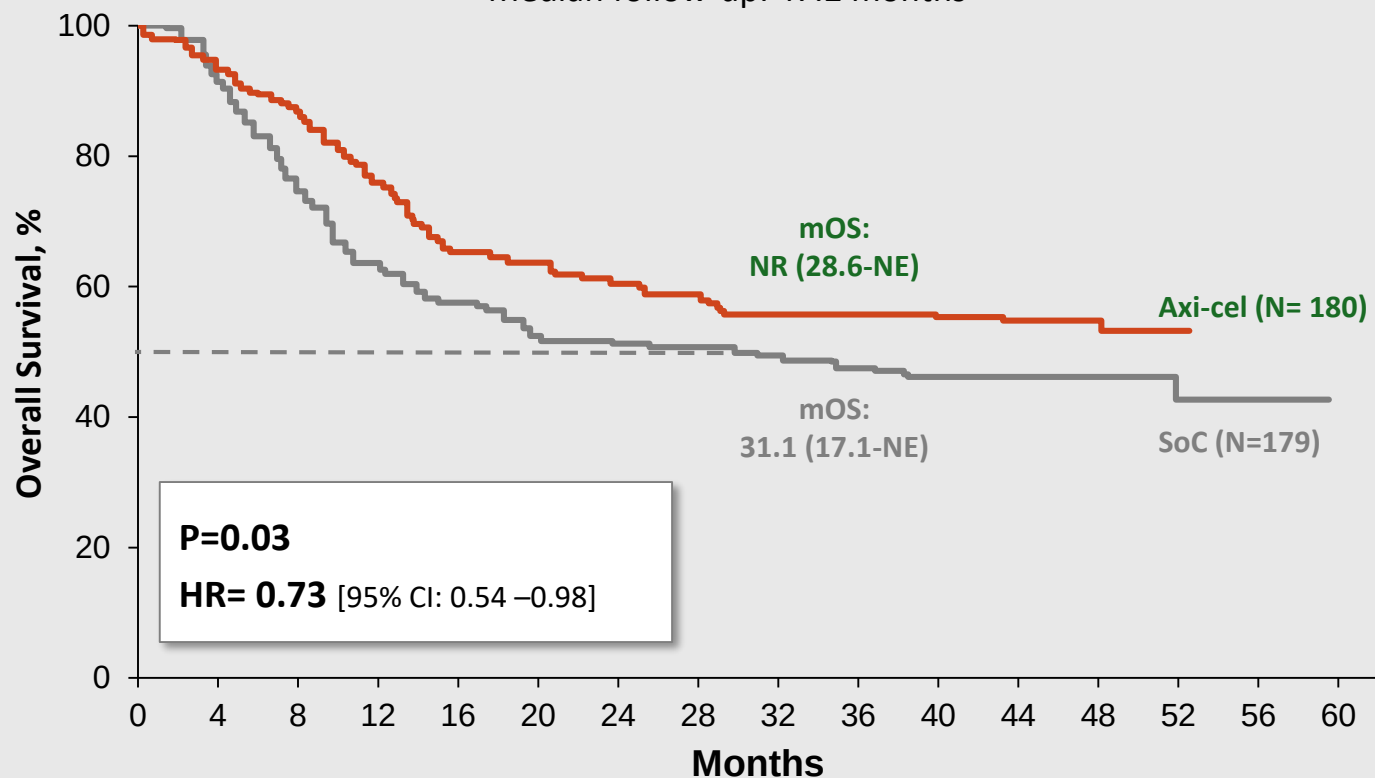


Axicabtagene ciloleucel

ZUMA-7: 5 Year Follow-Up

OS: Axi-cel versus SoC

Median follow-up: 47.2 months



Characteristics	Axi-cel	SoC
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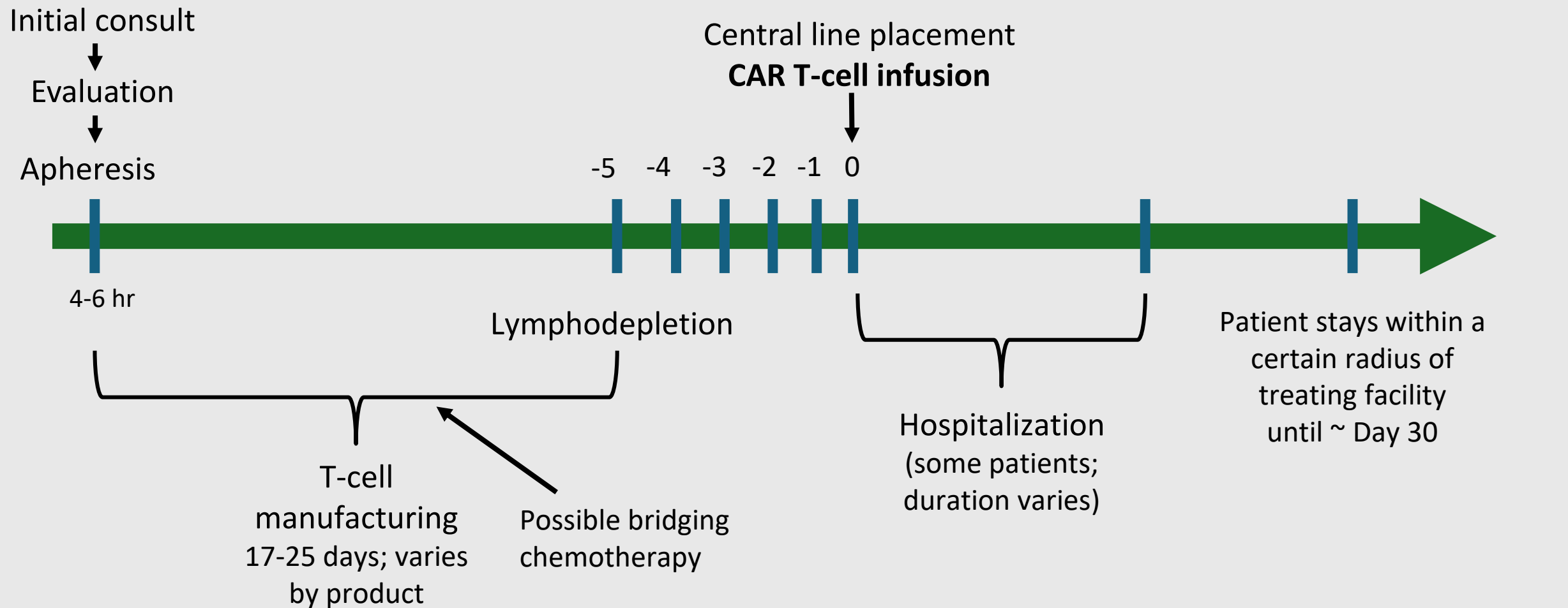


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Neuro event, any Gr (Gr3+)	60% (21%)	20% (1%)

Axi-cel demonstrated significantly longer OS compared to standard of care at a median follow-up of 47.2 months.



La terapia CAR-T requiera planeamiento



Tempo Mediano de Manufactura: 24 – 47 dias



Por que no tardar a encaminar?

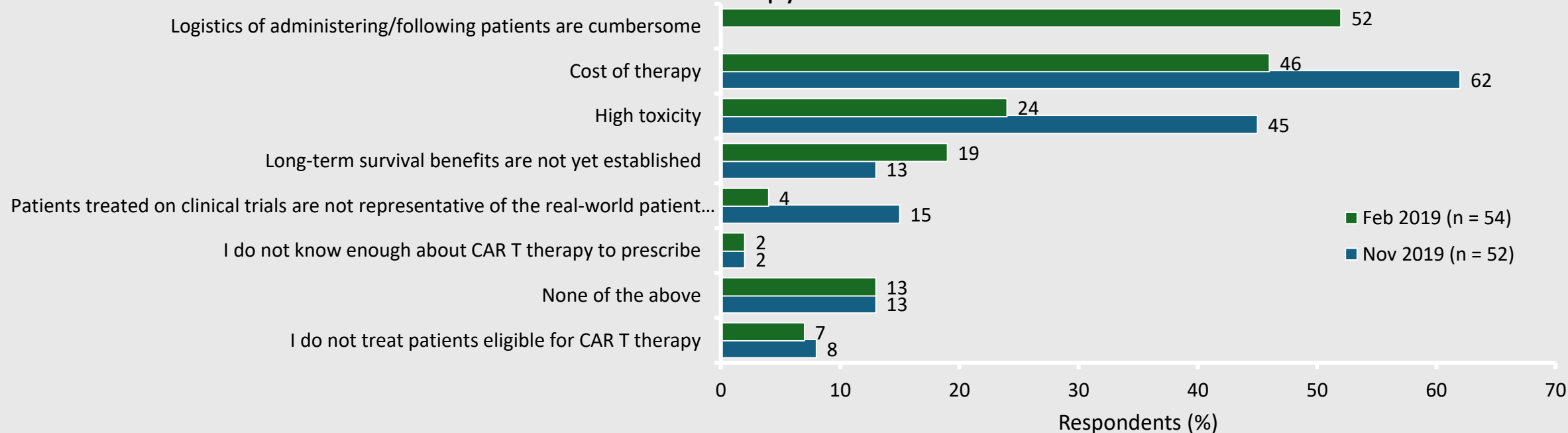
- La derivación temprana y eficiente es fundamental para el éxito de las terapias CAR-T
- Aspectos logísticos:
 - Disponibilidad del centro de CART
 - Autorización de las aseguradoras
 - Logística para pacientes de otras ciudades/países
- Aspectos clínicos:
 - Criterios para la terapia CAR-T
 - Rápido deterioro del paciente
 - Necesidad de terapia puente/holding
 - Biología de la enfermedad.



Perceptions of Community Hematologists/Oncologists on Barriers to CAR T-Cell Therapy for DLBCL

- 2019 survey of US community hematologists and oncologists

In your opinion, which of the following are top barriers to prescribing/recommending CAR T-cell therapy?



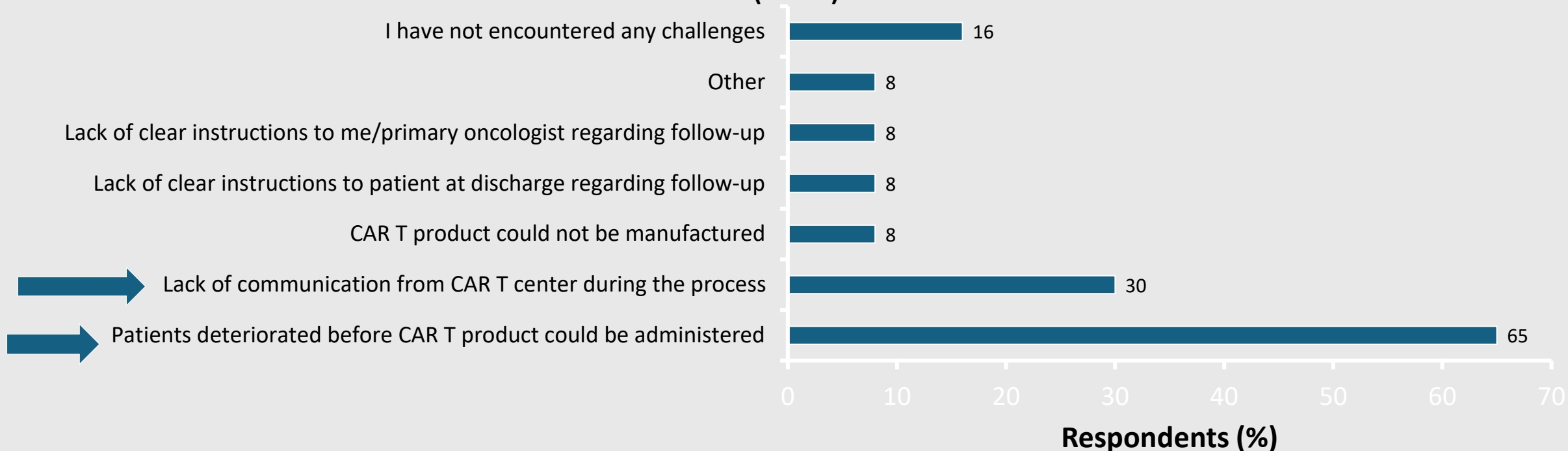


Perceptions of Community Hematologists/Oncologists on Barriers to CAR T-Cell Therapy for DLBCL

2019 survey of US community hematologists and oncologists

What additional challenges have you encountered in your patient's CAR T-cell journey?

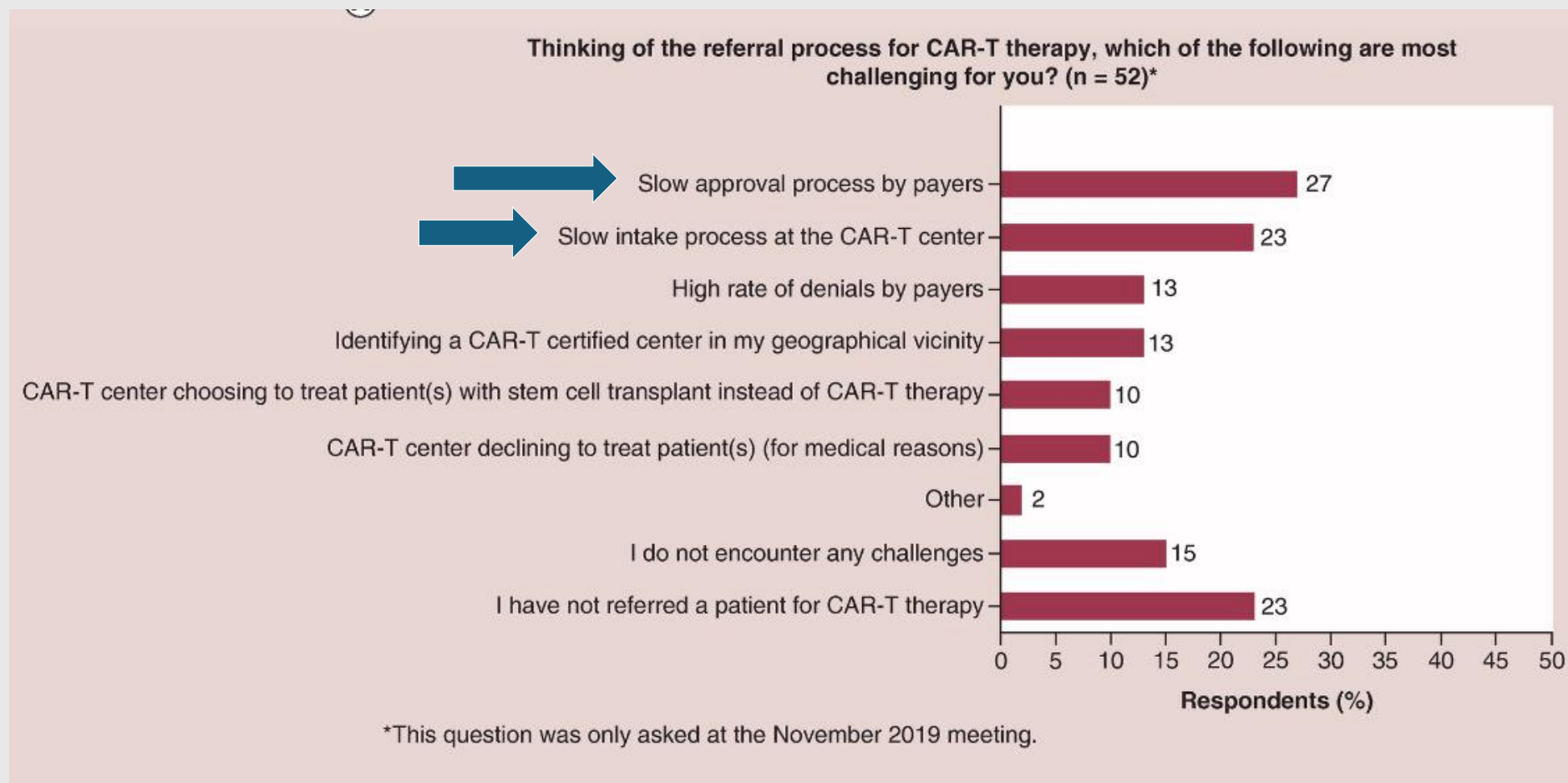
(n = 37)





Perceptions of Community Hematologists/Oncologists on Barriers to CAR T-Cell Therapy for DLBCL

2019 survey of US community hematologists and oncologists





¿Cómo acelerar el acceso al CART?

- Referral Centers:
 - Evaluación de recaída (confirmación por biopsia)
 - Contacto temprano con el centro de terapia con células T (CarT)
 - Planificación del momento de la aféresis con el equipo del centro de terapia con células T (CarT)
 - Planificación de la terapia de rescate/puente en conjunto con el centro



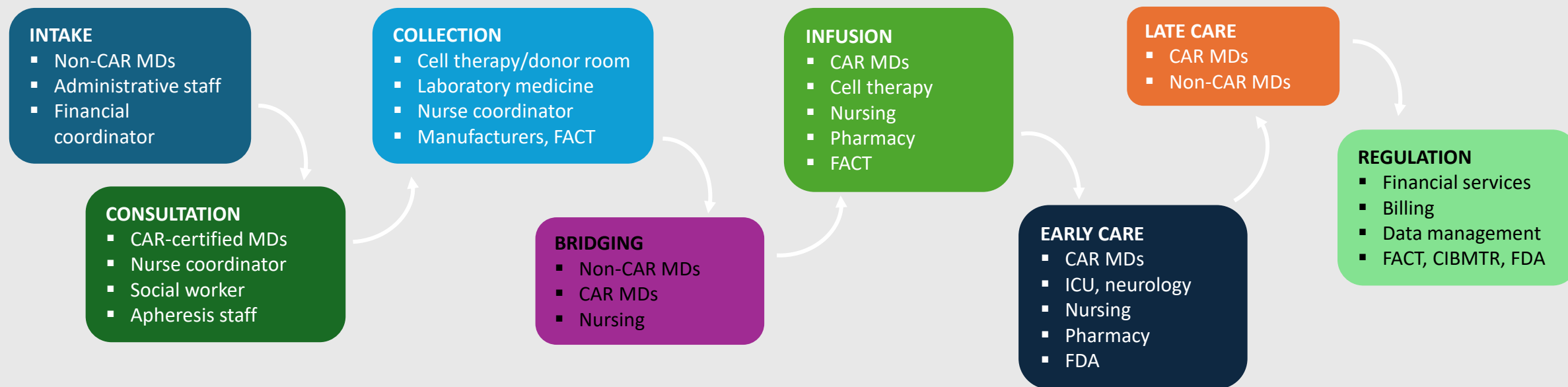
¿Cómo acelerar el acceso al CART?

- Centro CarT
 - Servicio de Comunicación Institucional > Médico tratante
 - Comités de tumores (Tumorboards) para la priorización
 - Enfermera de enlace
 - Modelos estructurados para aseguradoras
 - Equipo de negociación especializado



Diferentes players en el proceso dos CarT

Essential Steps and Required Personnel





Nuestro Problema en Brasil

Patients

- Limited number of treatment centers
- Travel, lodging, and meal expenses
- Utilization management policies
- Out-of-pocket costs
- Toxicities and side effects

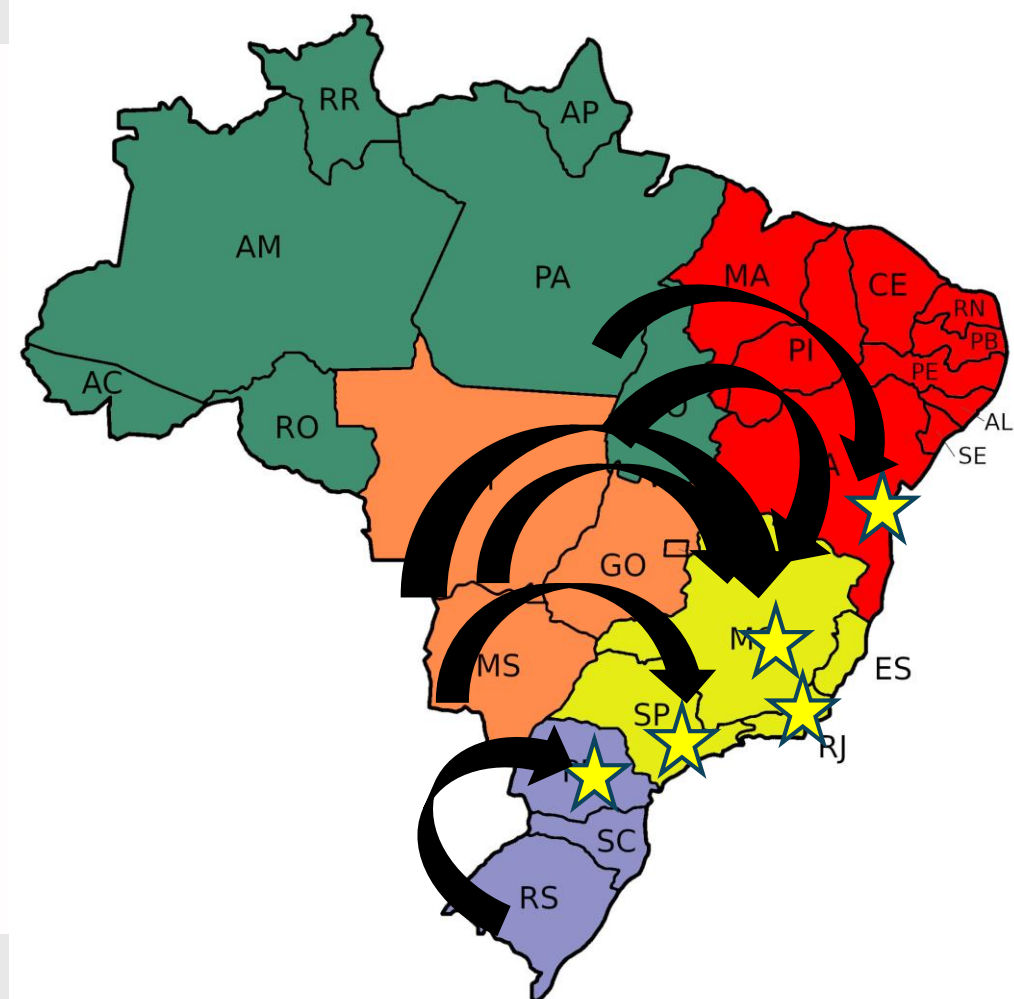
Provider

- Geography
- Logistics of follow up
- Reimbursement uncertainty
- Staff time and resources

Potential barriers to CAR-T treatment access

Provider

- Lingering manufacturing issues
- Difficulties with scaling up CAR-T manufacturing
- Payment issues
- Threats to future innovation





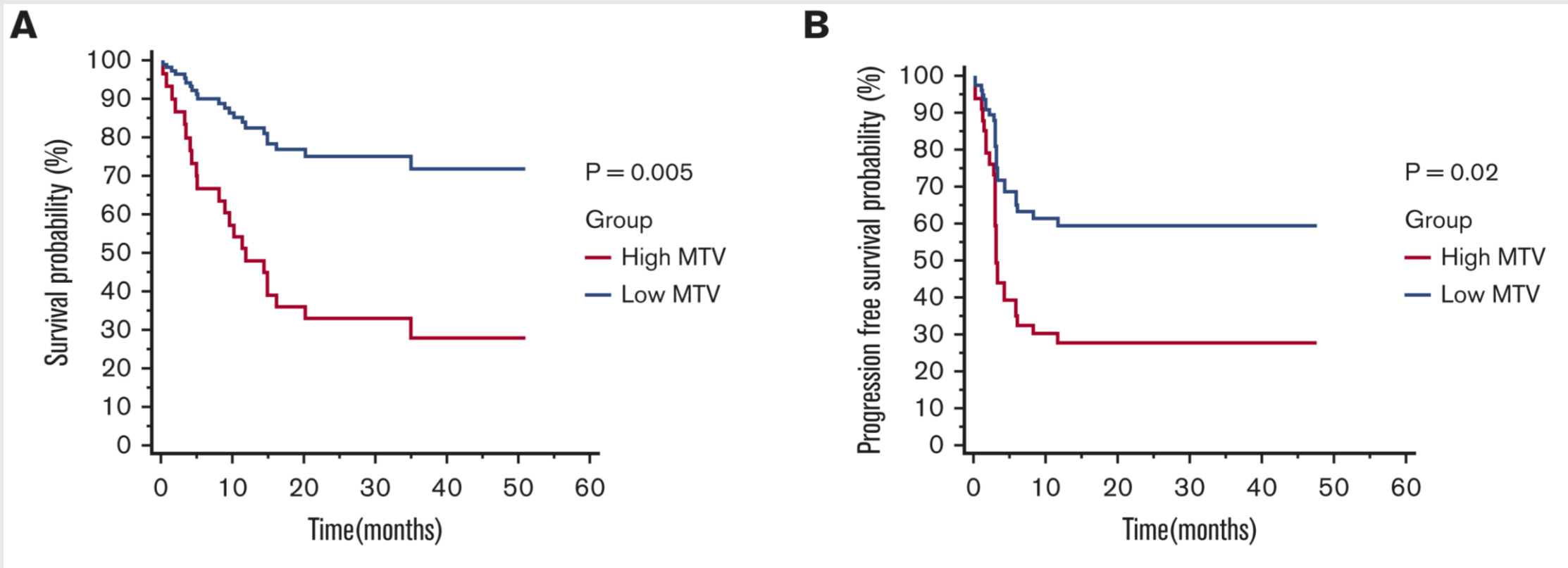
Questões Clínicas na Tomada de Decisão

Factor		Comments
Indications	- Does the patient meet a current indication for an FDA-approved CAR T-cell therapy? - Does the patient meet the criteria for a clinical trial?	
Kinetics of disease progression	- Would the patient be able to go through leukapheresis (without immediate use of steroids/chemotherapy) and remain stable until the T-cell infusion (3-4 wk)? - Does the patient need alternative therapy prior to CAR T-cell therapy consideration?	
Immediate prior therapy	How would this affect the ability to successfully manufacture CAR T-cells (ie, obtain sufficient numbers of T-cells and expand)?	
Concomitant immunosuppressive therapy	Can this be safely stopped prior to collection?	
Active infection	Higher risk of complications if patient experiences CRS	
Nondisease-related comorbidities	eg, severe cardiac dysfunction, active symptomatic neurologic symptoms (difficult to accurately assess neurotoxicity)	



¿Pq encaminar precozmente?

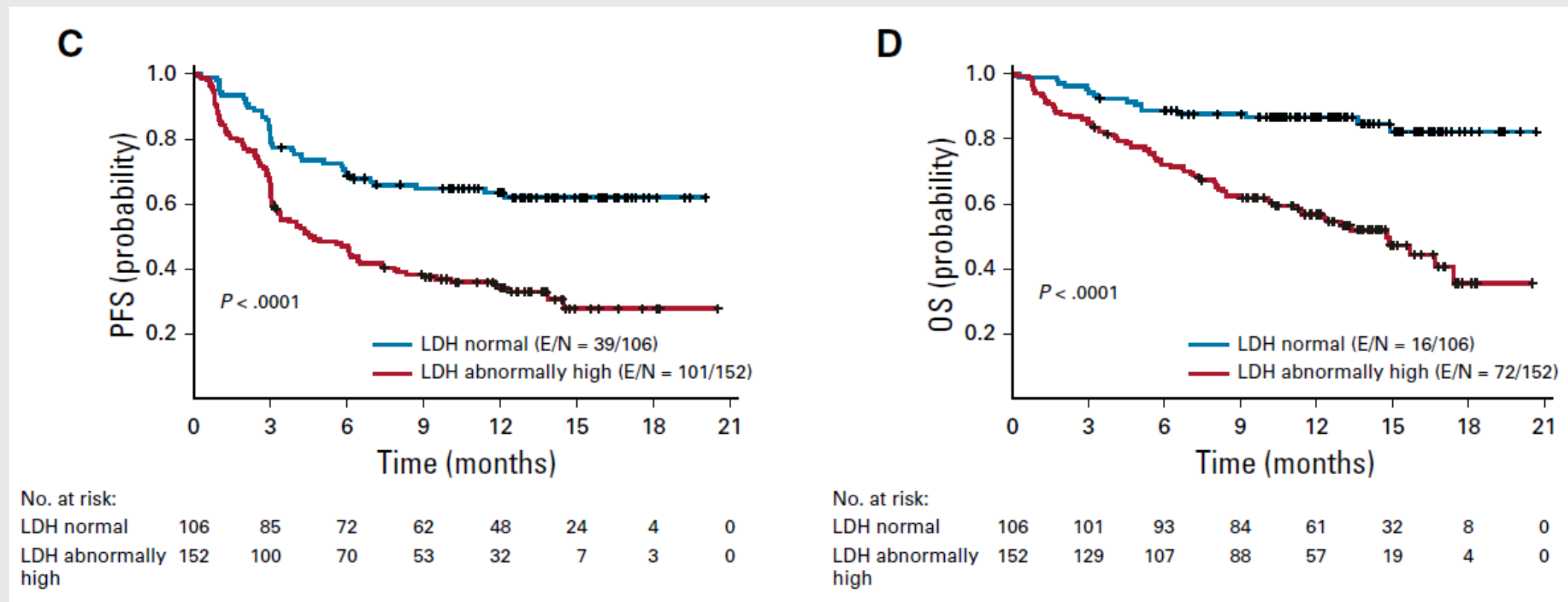
Carga Tumoral





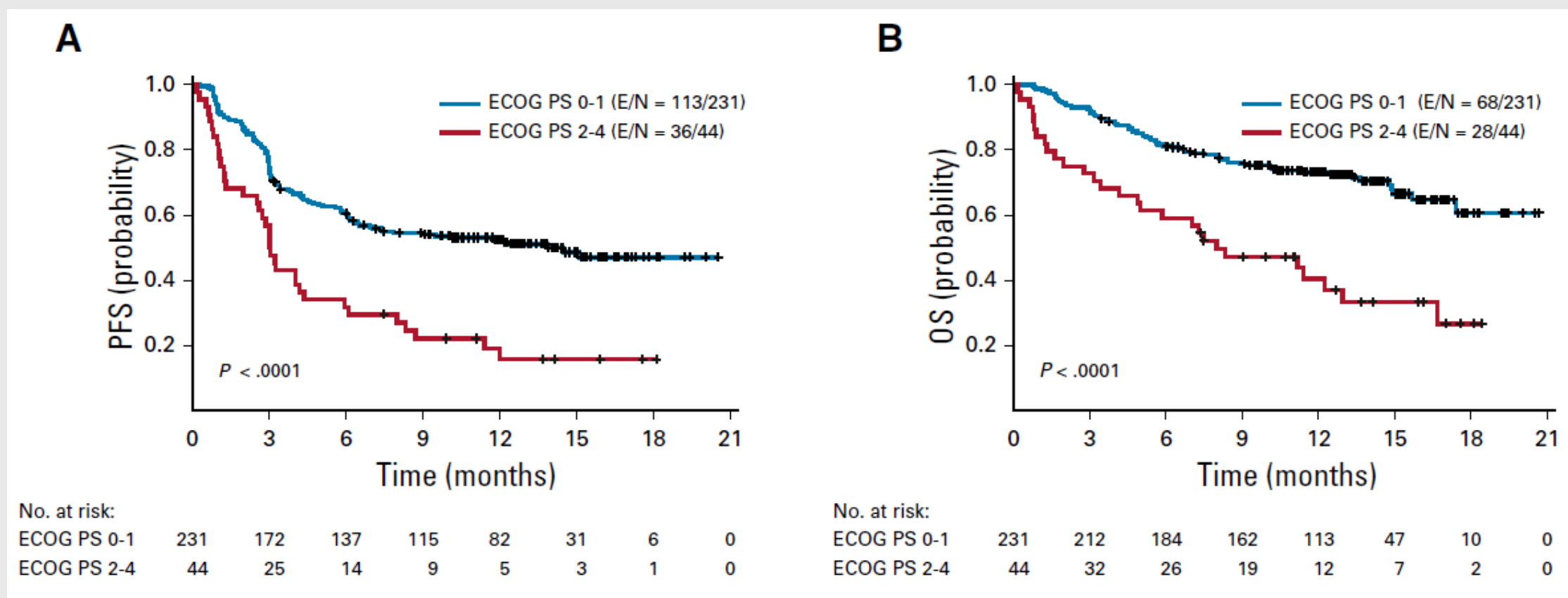
¿Pq encaminar precozmente?

Carga Tumoral (DHL)



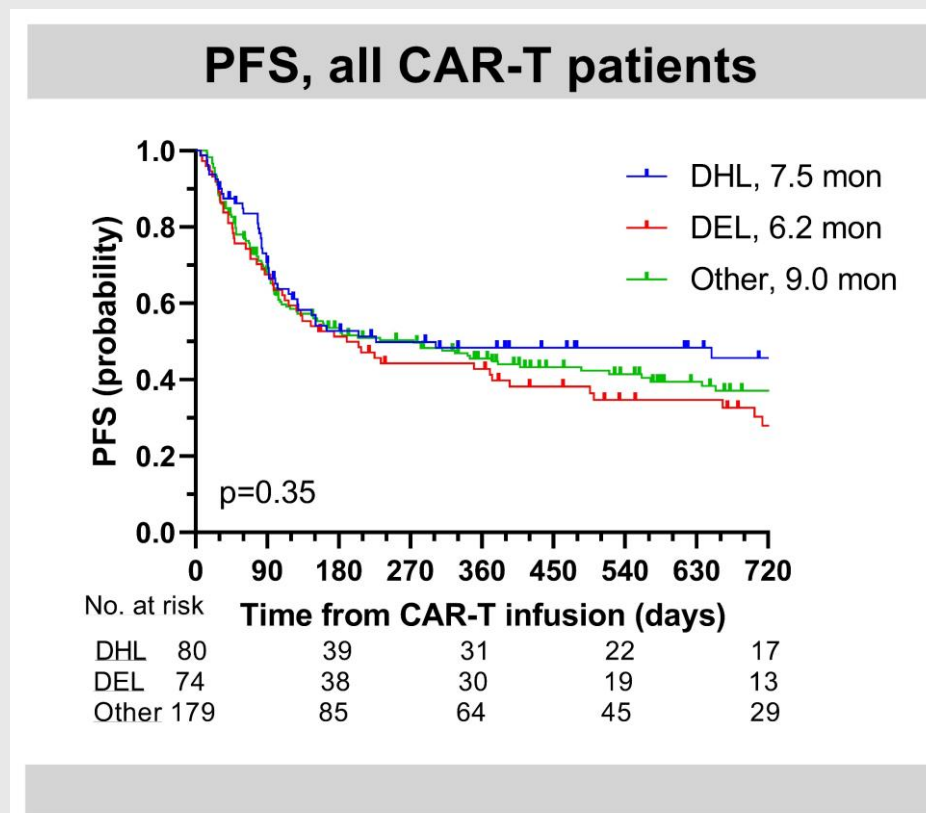
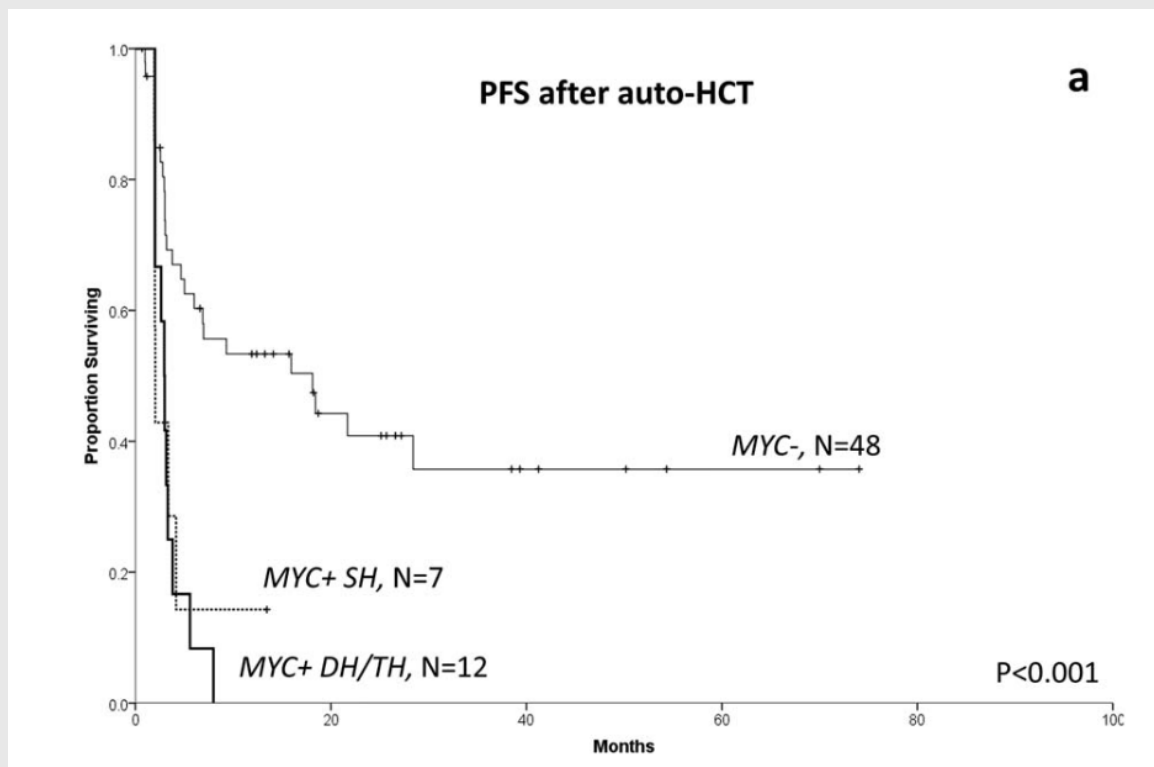
¿Pq encaminar precozmente?

- Peora del PS

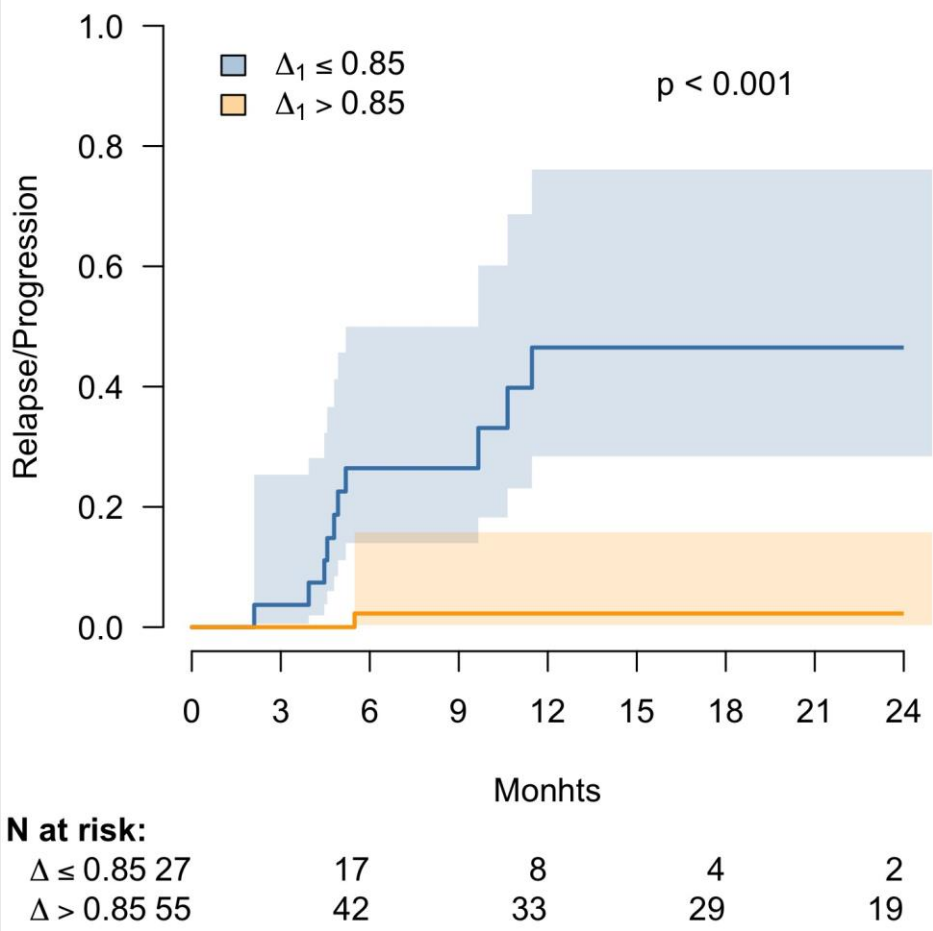
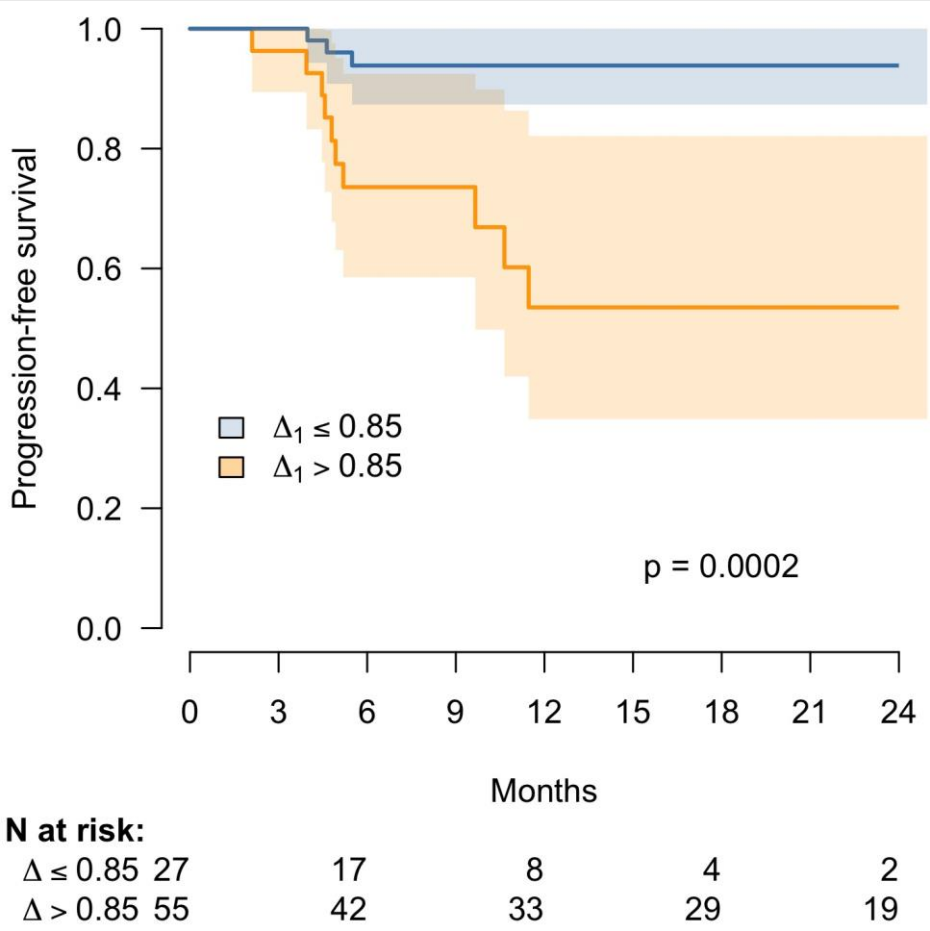


¿Pq encaminar precozmente?

- Por que en algunos subtipos, NADA va a tener control de la enfermedad



Como indentificas pacientes de alto Riesgo para Cart?



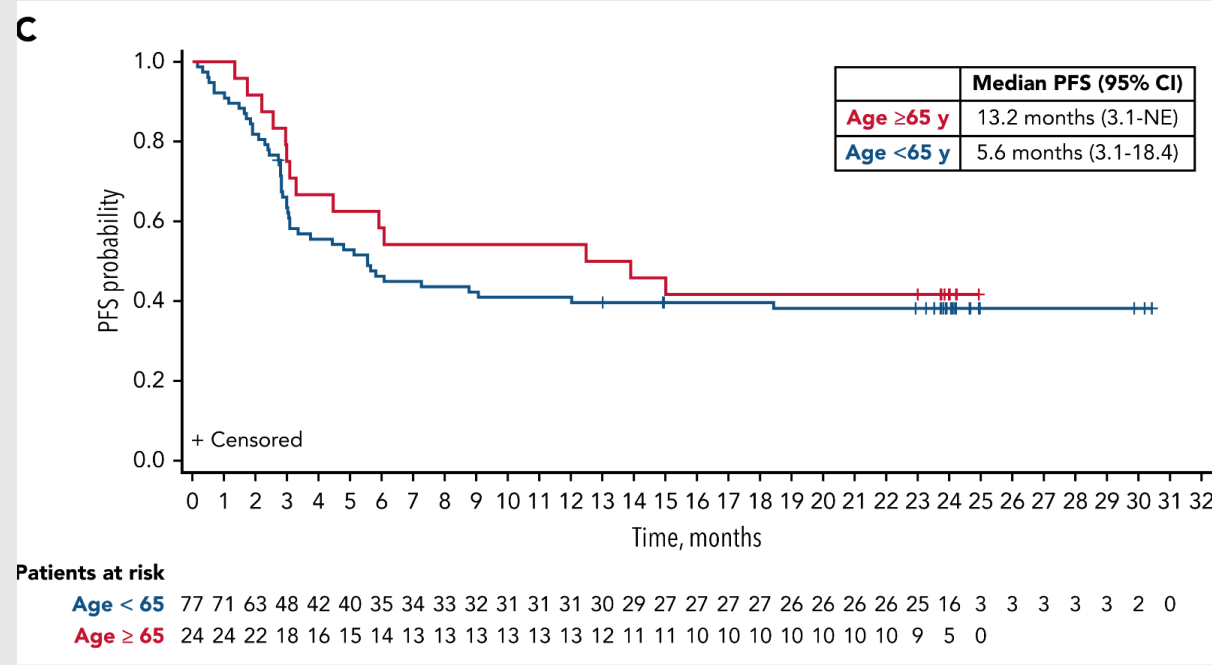
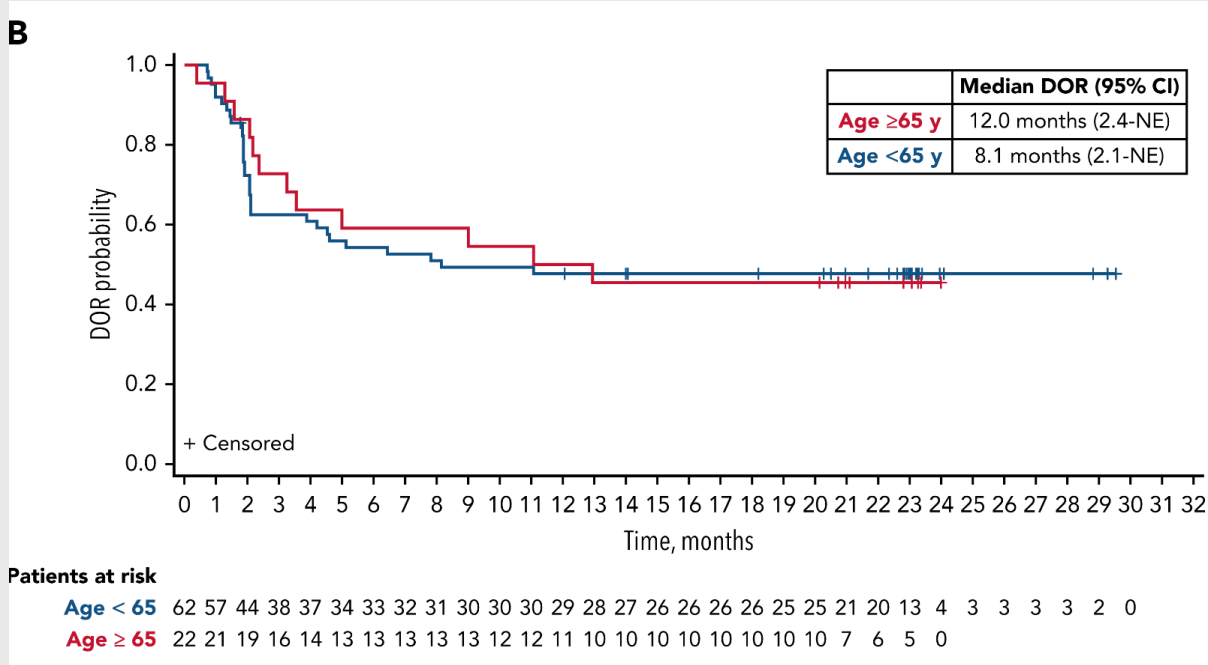


Transplant-Ineligible, CarT-Eligible (TICE)

- Algunos pacientes no serán candidatos a trasplante autólogo de células madre hematopoyéticas (ASCT), pero sí a terapia con células T de rescate (CART)
 - Edad
 - Comorbilidades
 - Control insatisfactorio de la enfermedad con terapias de rescate
 - Fallo en la recolección de células
- Estos pacientes deben ser considerados candidatos a CART y derivados precozmente
 - CGA
 - Enfoque multidisciplinario

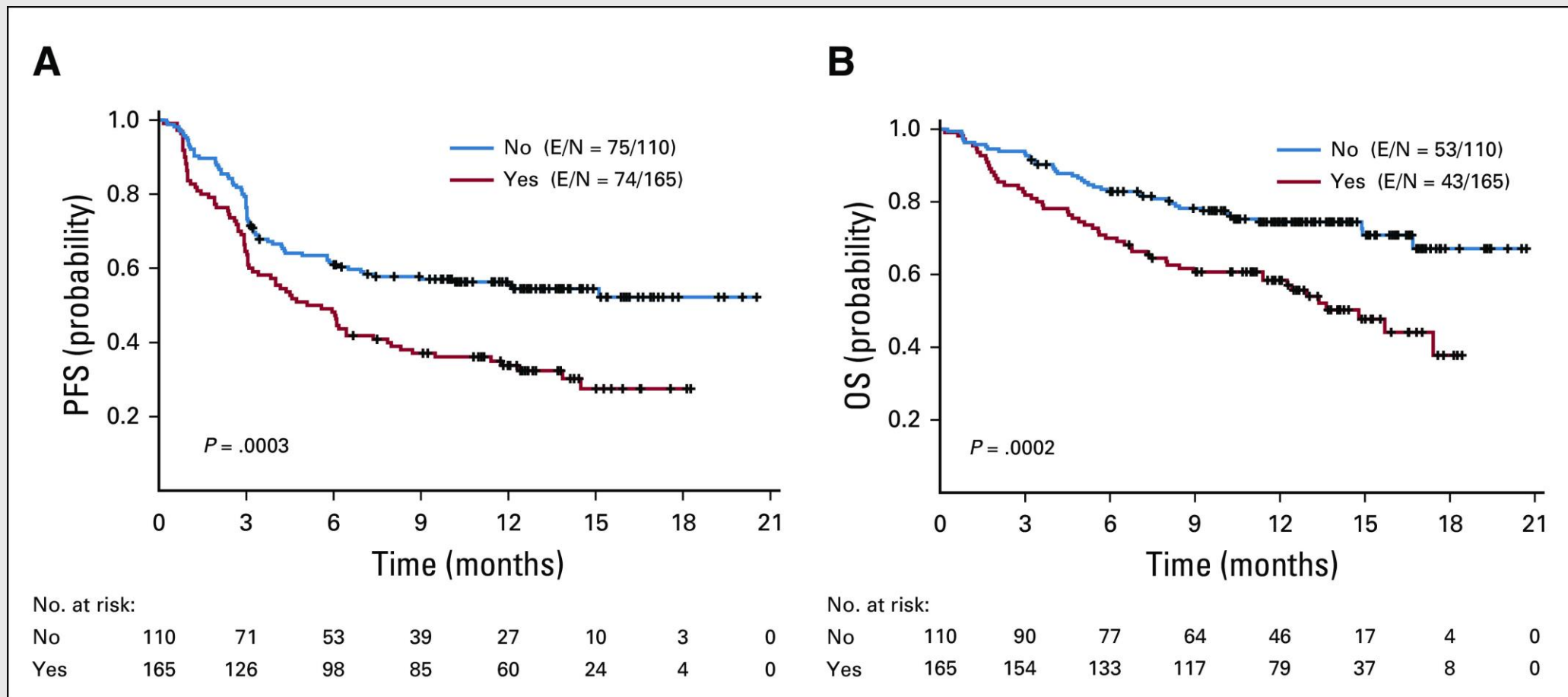


TICE – La edad no es un factor limitante!

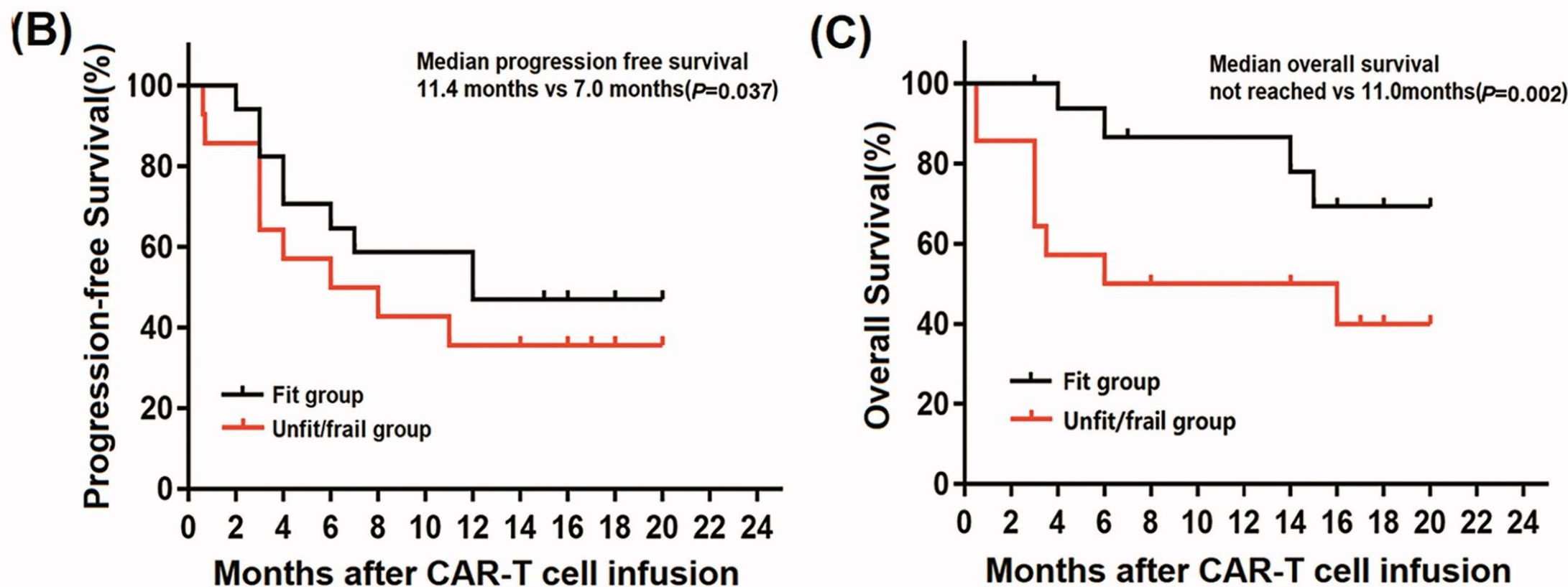




TICE – pero comorbilidades...

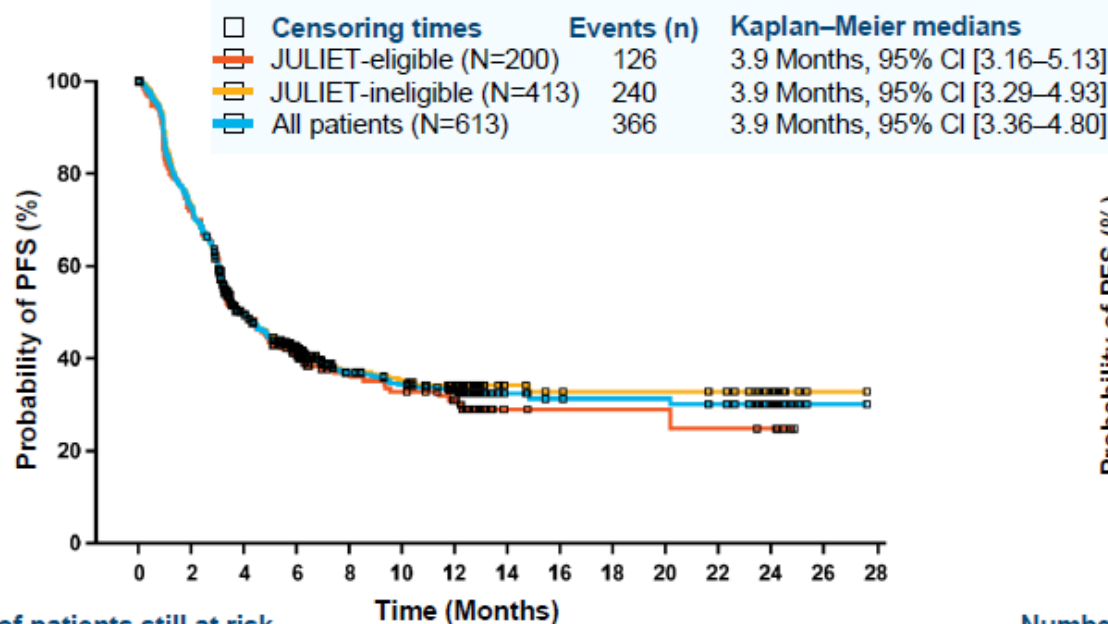


TICE – Impacto de Evaluación Geriátrica



Progression-free survival

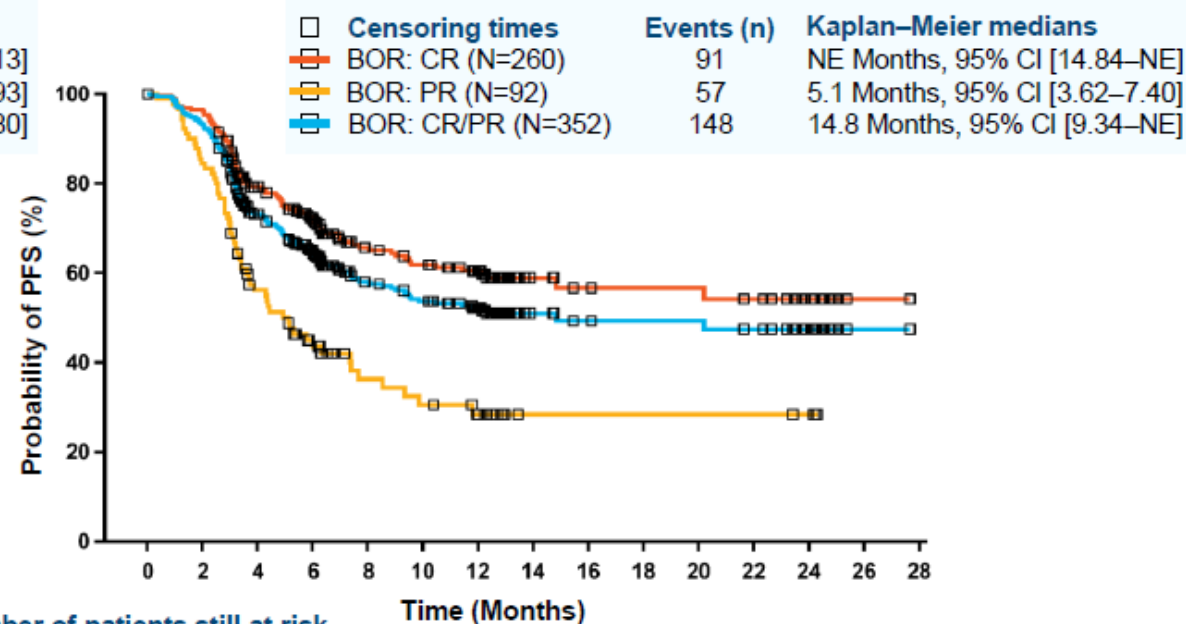
PFS by JULIET eligibility



Number of patients still at risk

	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28
JULIET-eligible	200	137	88	66	45	40	34	8	7	7	7	6	5	0	
JULIET-ineligible	413	289	168	129	82	75	65	24	21	20	20	19	12	1	0
All patients	613	426	256	195	127	115	99	32	28	27	27	25	17	1	0

PFS by BOR



Number of patients still at risk

	0	2	4	6	8	10	12	14	16	18	20	22	24	26	28
BOR: CR	260	247	177	147	104	96	85	28	24	23	23	21	14	1	0
BOR: PR	92	76	46	31	19	16	12	4	4	4	4	4	3	0	
BOR: CR/PR	352	323	223	178	123	112	97	32	28	27	27	25	17	1	0

Month 12 PFS rates were similar between JULIET-ineligible patients (34.2%) and the overall CIBMTR population (33.1%); both reflect that seen in JULIET (34.6%)¹



Terapias de Rescate y Puente

- Las terapias de rescate pueden afectar la calidad del producto y deben coordinarse con el Centro CarT
- El tiempo de washout y los tipos de terapia pueden influir significativamente en los resultados del paciente
- También se debe analizar la terapia puente con el equipo CarT.

Terapias de Rescate/Puente

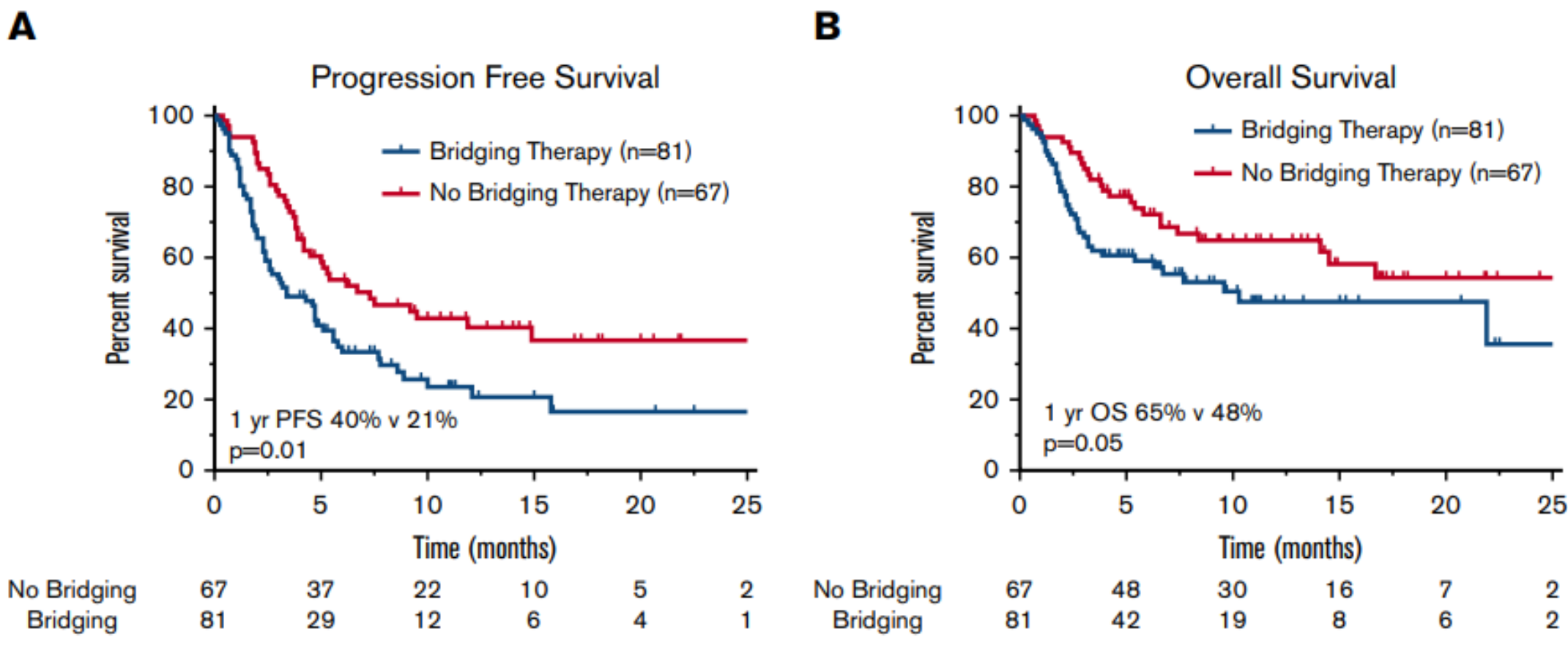


Time de Aférese

Time CarT

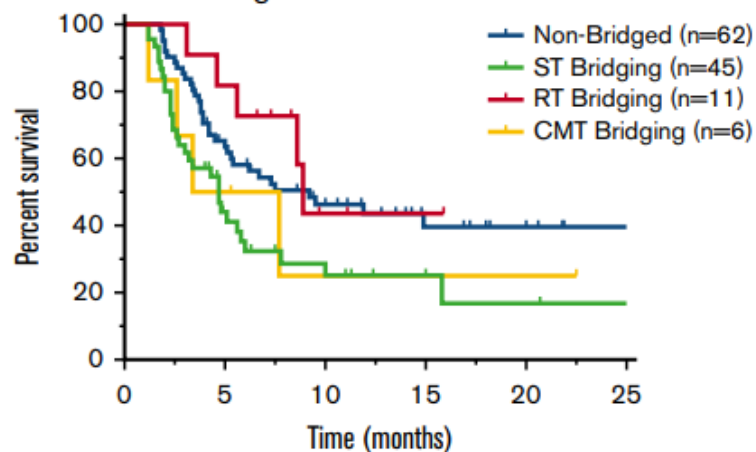


Impacto da Terapia de Ponte



Impacto da Terapia de Ponte

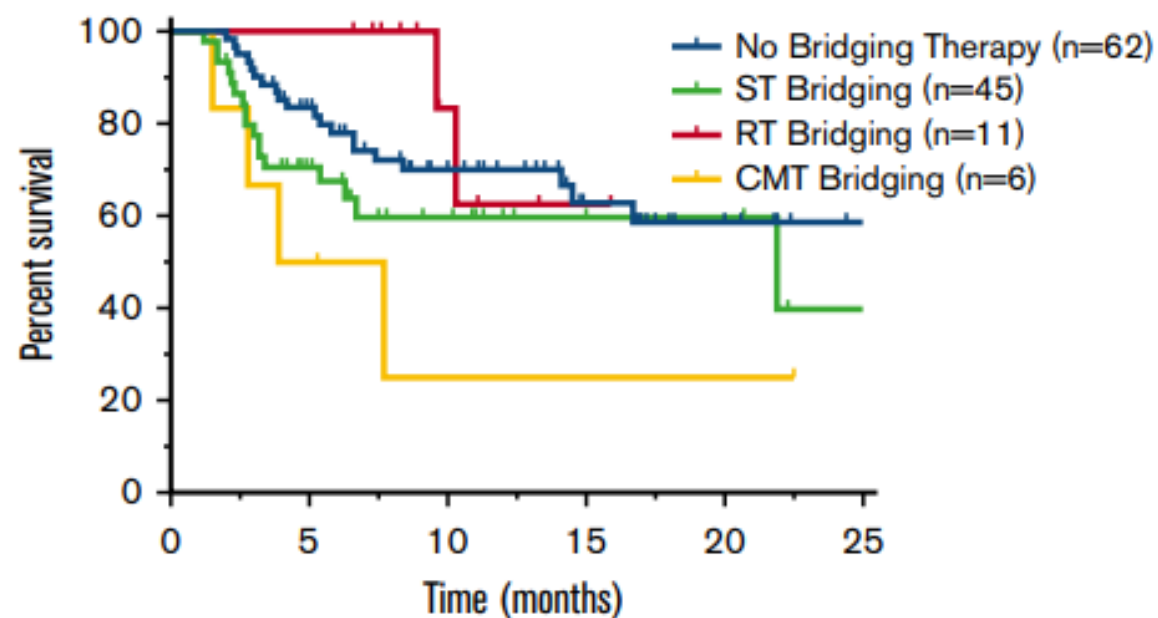
Progression Free Survival



No Bridging	62	37	22	11	5	1
ST Bridging	45	16	8	4	3	1
RT Bridging	11	10	3	2	0	0
CMT Bridging	6	4	2	2	1	0

No bridging vs ST p=0.01
 No bridging vs RT p=0.52
 No bridging vs CMT p=0.36
ST vs RT p=0.05
 ST vs CMT p=0.78
 RT vs CMT p=0.17

Overall Survival





¿Pq encaminar precozmente?

- Impacto de terapias anteriores

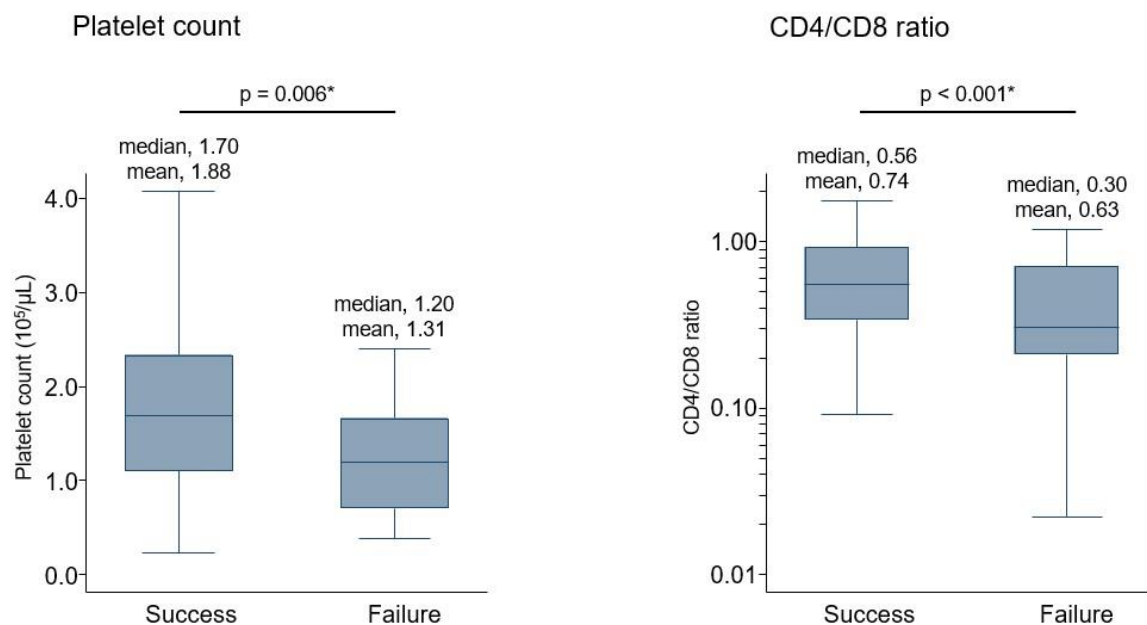


Figure 1. Comparison of platelet count and CD4/CD8 ratio in peripheral blood at apheresis between the failed and successful group

Figure 2.- Best response achieved after CAR T-cell therapy depending on the use and timing of previous bendamustine.

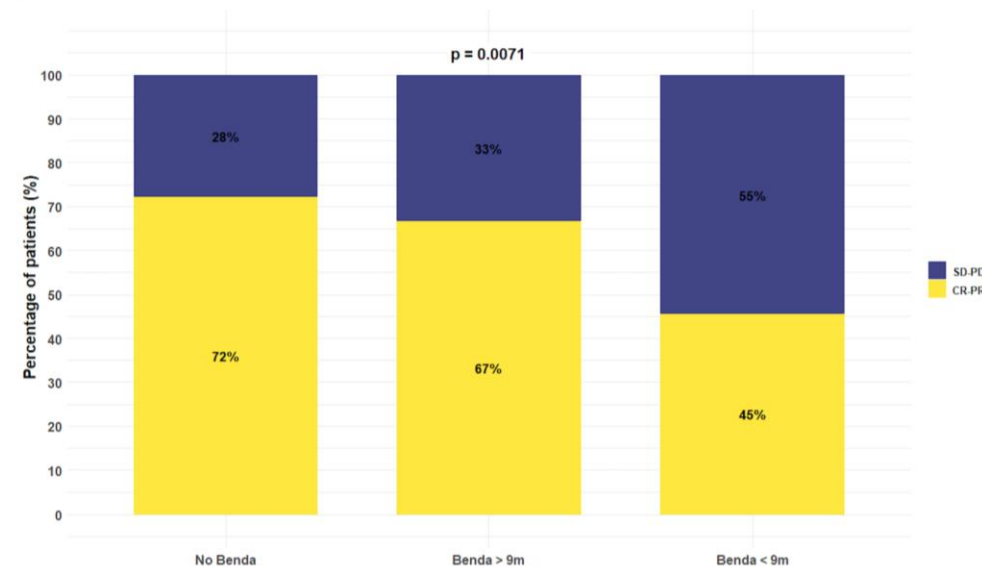


Figure abbreviations: CM central memory, TM transitional memory, EM, effector memory, TDE terminal effector, CR complete response, PR partial response, SD stable disease, PD progressive disease



Optimización de pacientes para CART

- La derivación temprana es crucial.
- Idealmente, después de la primera recaída.
- A más tardar, después del tratamiento de segunda línea.
- La terapia CarT es un procedimiento que requiere tiempo:
 - Aprobación de las aseguradoras
 - Disponibilidad del centro
 - Logística de viaje
 - Aféresis
 - Manufactura

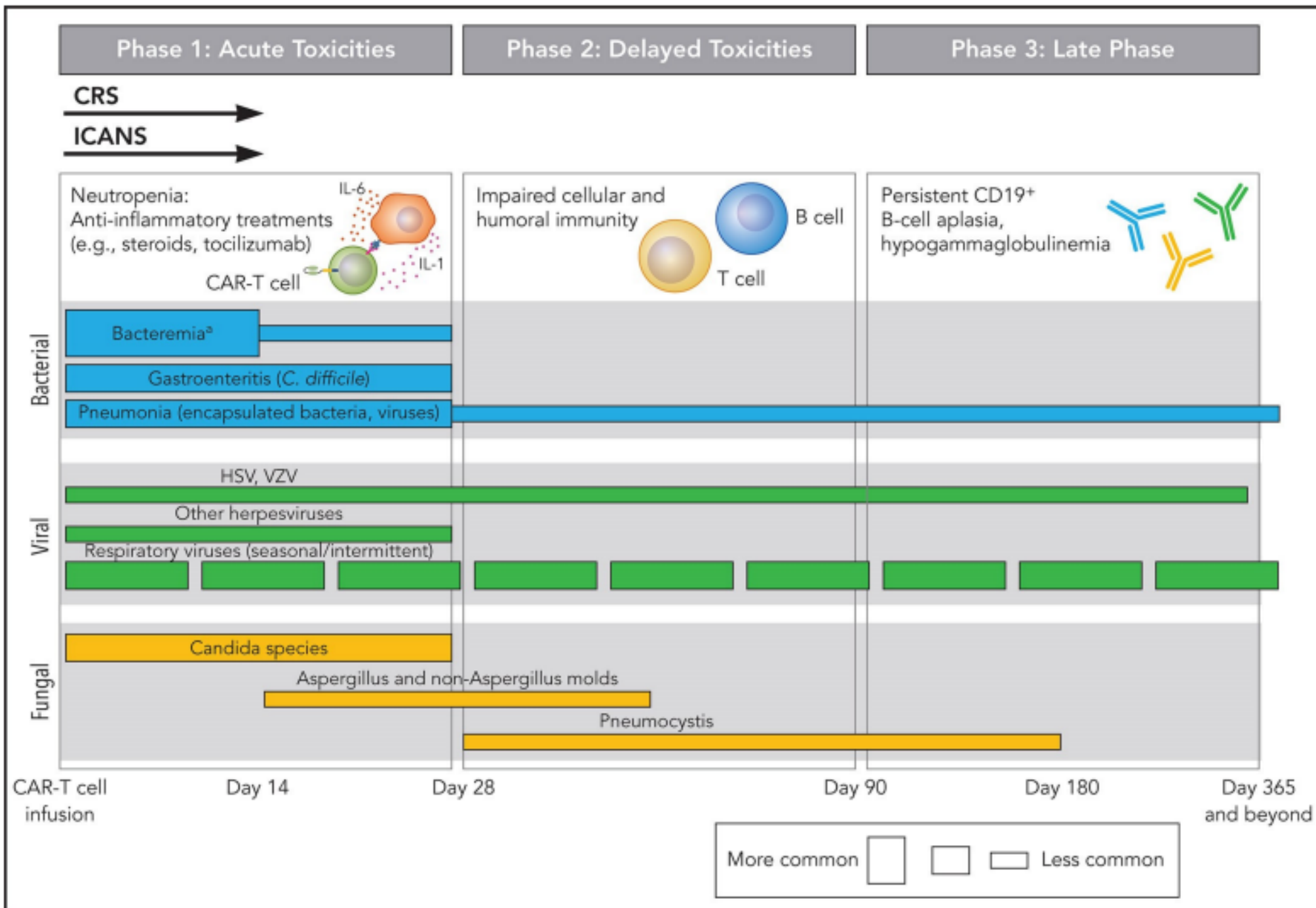
Optimización de pacientes para CART

- La coordinación entre los médicos remitentes y el equipo de terapia CART es fundamental:
 - Identificación de casos prioritarios
 - Elección del momento óptimo para la aféresis
 - Evaluación completa, especialmente en pacientes más frágiles
 - Elección de la terapia de holding
 - Elección de la terapia puente





Y después del CarT?





Follow Up después del CarT

Frecuencia de visitas:

Hasta el alta hospitalaria (D+60): semanal

Del D+60 al D+100: quincenal

Ferritina, perfil de coagulación

PCR cuantitativa para CMV: Si IgG es positiva, semanal hasta el D+30 y, si se están tomando corticosteroides, semanal hasta 30 días después de su suspensión

Niveles de inmunoglobulinas mensuales durante los primeros 6 meses

Citometria de flujo: CD3/CD4/CD8/CD19/CD56: Mensual hasta el día +90 y trimestralmente a partir de entonces.

Persistencia de células CAR-T: No disponible comercialmente; para la LLA, utilizar reconstitución de células B aplásicas.

Evaluación del estado de la enfermedad y la respuesta: Días +30, +90, +180, +360 y anualmente a partir de entonces.

Estar atento a la posible aparición de enfermedades mieloides relacionadas con el tratamiento en caso de nuevas citopenias.



Follow Up después del CarT

- Hayden PJ, Annals of Oncol. 2021

Tests	EBMT/EHA recommendations		Comments
	Purpose	Frequency	
FBC, biochemistry panel, AST, ALT, bilirubin, LDH, fibrinogen, CRP	Standard follow-up	At every visit and as clinically indicated	
CMV, EBV, adenovirus, COVID-19	Viral reactivation/infection (post-allo-HCT)	As clinically indicated	
Quantitative immunoglobulins or serum protein electrophoresis	Immune reconstitution	1-3 monthly	Consider i.v. (or s.c.) immunoglobulin replacement
Peripheral blood immunophenotyping—CD3/4/8/16+56/19+	Immune recovery	Once monthly for first 3 months, three monthly thereafter in first year	Guide to anti-infective prophylaxis and vaccination schedule
CAR-T monitoring	CAR-T persistence	Peripheral blood flow cytometry or transgene by molecular methods as clinically indicated	This is not feasible in most centres. For B-ALL, B-cell aplasia may be used as a surrogate for persistence.

Table 12. Infection prophylaxis post-CAR-T

	EBMT/EHA recommendation	Comments
Neutropenia	G-CSF to shorten duration of neutropenia from day +14 or after resolution of CRS or ICANS Can consider starting earlier, e.g. day 5, ^a if patient is at high risk of infection, e.g. ALL, post-allo-HCT, high-dose steroids. For persistent neutropenia ($<0.5 \times 10^9/l$) following day +28, consider G-CSF	Avoid if patient has CRS or ICANS
Antibacterial prophylaxis	Not routinely recommended ^b	Can be considered in case of prolonged neutropenia and should be based on local guidelines, e.g. with levofloxacin or ciprofloxacin
Anti-viral	Valaciclovir 500 mg bid or aciclovir 800 mg bid	Start from LD conditioning until 1-year post-CAR T-cell infusion AND until $CD4^+$ count $>0.2 \times 10^9/l$
Anti-pneumocystis	Co-trimoxazole 480 mg once daily or 960 mg three times each week To start from LD conditioning until 1-year post-CAR-T cell infusion AND until $CD4^+$ count $>0.2 \times 10^9/l$ Where there is prolonged myelosuppression, postpone start after $ANC >0.5 \times 10^9/l$	Can be started later depending on centre guidelines In case of co-trimoxazole allergy (or cytopenias precluding use of co-trimoxazole), pentamidine inhalation (300 mg once every month), dapson 100 mg daily or atovaquone 1500 mg once daily can be considered
Systemic anti-fungal prophylaxis	Not recommended routinely; consider posaconazole (300 mg/day) or fluconazole (200 mg/day) or micafungin (50 mg i.v./day) in patients with severe ($ANC <0.5 \times 10^9/l$) or prolonged (>14 days) neutropenia and/or in patients on long-term or high-dose (>72 h) corticosteroids or in patients post-allo-HCT	In patients with prior allo-HCT, prior invasive aspergillosis and those receiving corticosteroids, posaconazole prophylaxis should be considered
i.v. Immunoglobulin	Routine in children. Consider in adults with serious/recurrent infections with encapsulated organisms and hypogammaglobulinemia (<4 g/l)	Clinical evidence does not support routine use in adults following allo-HCT



Follow up D+100

- Días +100 a 1 año: Mensual
- 1 a 2 años: Semestral
- 2 a 15 años: Anual
- Perfil hormonal: TSH, T4L, FSH, LH, estradiol, progesterona, cortisol, testosterona total y libre, perfil lipídico y evaluación ósea (densitometría ósea)
- Autoinmunidad: ANA, ENA, FR, ANCA, anti-TPO) e investigación específica de eventos inmunitarios tardíos (neumonitis, gastritis, colitis, enfermedad granulomatosa, dermatitis, etc.)
- Neoplasias secundarias: Screening de neoplasias hematológicas (SMD, LMA, trastornos linfoproliferativos de células T), cáncer de piel (screening dermatológico) y screening de neoplasias sólidas (endoscopia, colonoscopia, PSA total y libre, mamografía, citología vaginal)
- Trastornos neuropsiquiátricos y calidad de vida: Evaluación y apoyo multidisciplinario si es necesario



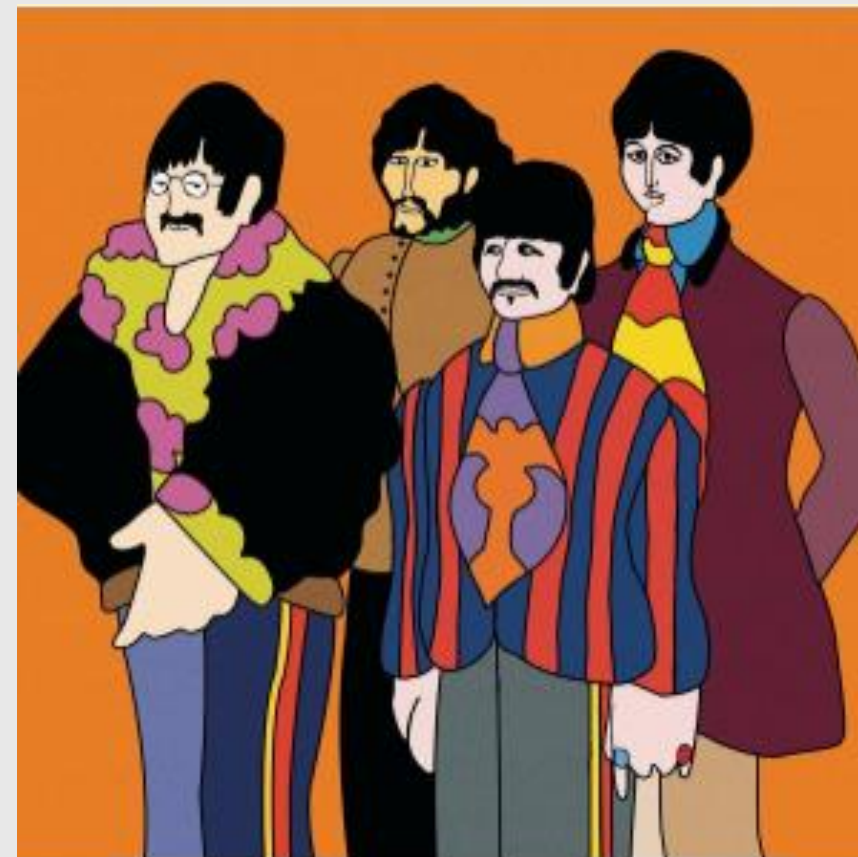
Follow up D+100

Table 14. Recommended minimum frequency of attendance at CAR-T centre for patients in remission for late effects monitoring

Period	EBMT/EHA recommendations	
	Visit frequency	Outcomes to be monitored
Day +100 to 1 year	Monthly	• Disease—remission, minimal residual disease (MRD) status, relapse, death • Subsequent treatments including allo-HCT and other IEC therapy/ATMP • Immunological status—immune cell markers, immunoglobulins, CAR-T persistence • New cancers/secondary myeloid diseases • Autoimmunity and new autoimmune diseases • Endocrine, reproductive and bone health including growth and development • Neurological status (recovery from ICANS) • Psychological status and quality of life • Cardiovascular disease, including risk factors such as metabolic syndrome • Respiratory function • Gastrointestinal and liver health
1-2 years	Six-monthly	
2-15 years	Annually	

Conclusiones

- Antes y Después, la integración de los centros es una estrategia necesaria
- CarT es una (si no la mejor) terapia en LNH DCBG RR, pero es un trabajo de equipo, no de 1 persona solo
- En LATAM, necesitamos trabajar para que los centros derivadores se queden confortables en toda ruta del paciente





Gracias! Muito Obrigado!

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