BMT infonet.org
BLOOD & MARROW TRANSPLANT INFORMATION NETWORK
SURVIVORSHIP SYMPOSIUM

Transplantation in Older Adults: Who is a Good Candidate

Celebrating a Second Chance at Life
Survivorship Symposium

April 30 - May 6, 2022

Uday Popat MD
The University of Texas
MD Anderson Cancer Center

Stem Cell Transplantation in Older Patients

Uday Popat MD MBA
BMT Infonet Survivorship Symposium
May 3, 2022

Key Points

Older patients are most in need of, and are increasingly undergoing stem cell transplantation (SCT)

- but outcomes need to be improved

Factors predicting likelihood of success (Prognostic Factors)

- Other health concerns at time of transplant (comorbidities)
- Geriatric assessment:
  - ability to plan and do daily activities independently
  - Cognitive status (ability to process information)

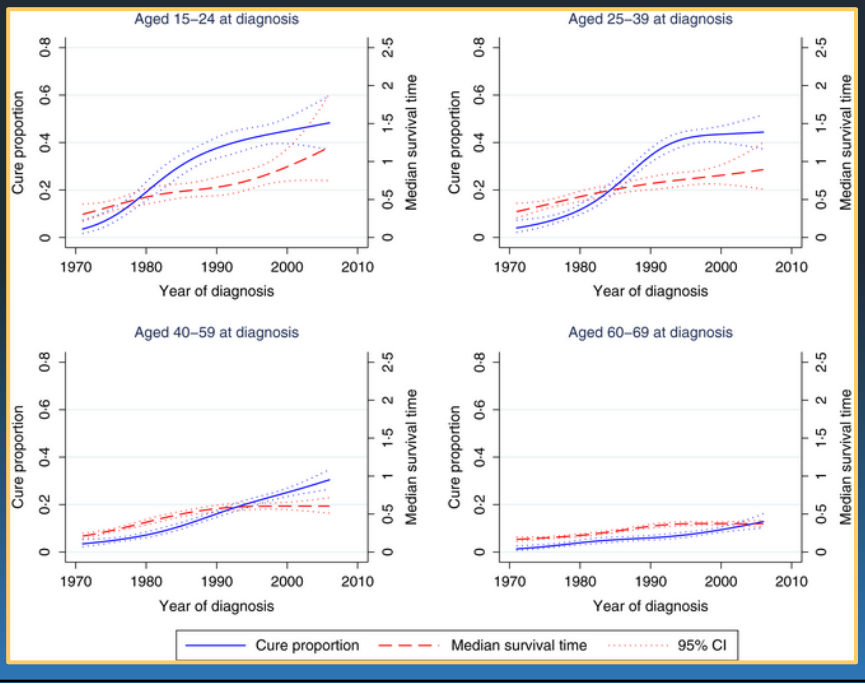
3

Key Points cont'd

- How do you improve outcomes in older patients?
  - Better conditioning regimen:
    - fractionated busulfan regimen
  - Better supportive care:
    - Enhanced recovery in stem cell transplantation program (ER-SCT) to
      - maintain patient's ability to physically recover from treatment (physiological reserve) despite older age
      - reduce non-relapse mortality

4

Survival and cure of acute myeloid leukemia in England, 1971-2006



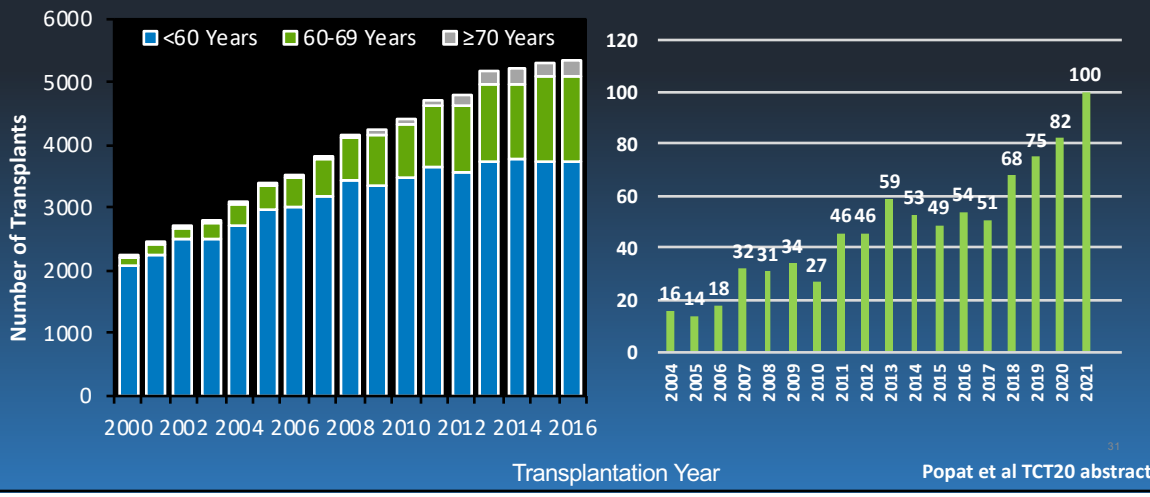
Shah A et al Br J Haem 2013

How old is "old" for transplant?

- It changes as I get older?
- ? >60
  - When prognosis is poor
  - When you use reduced intensity regimen
- ? >65
  - Medicare
- Median age of all blood cancers except ALL is around 68-70
- Transplant can be curative in substantial number of patients

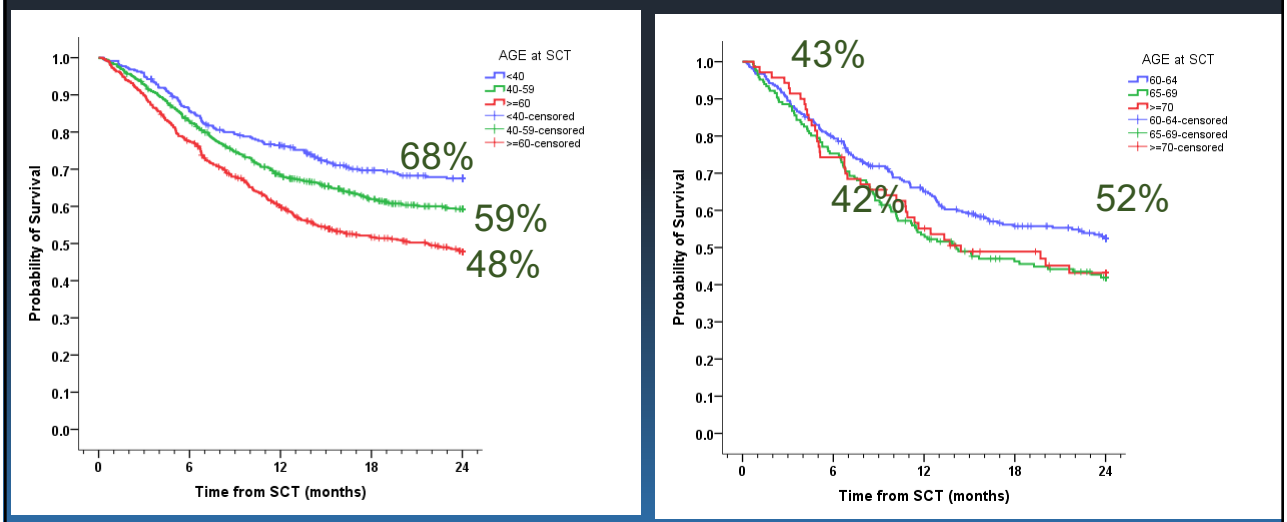
6

Increasing age of patients undergoing allogeneic transplantation



Popat et al TCT20 abstract # 65

Overall Survival by Age after Transplant with Matched Donors 2010-2015



(total number =1,545)

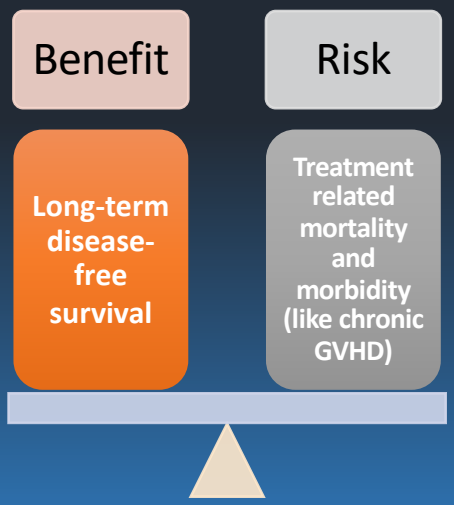
Key Points

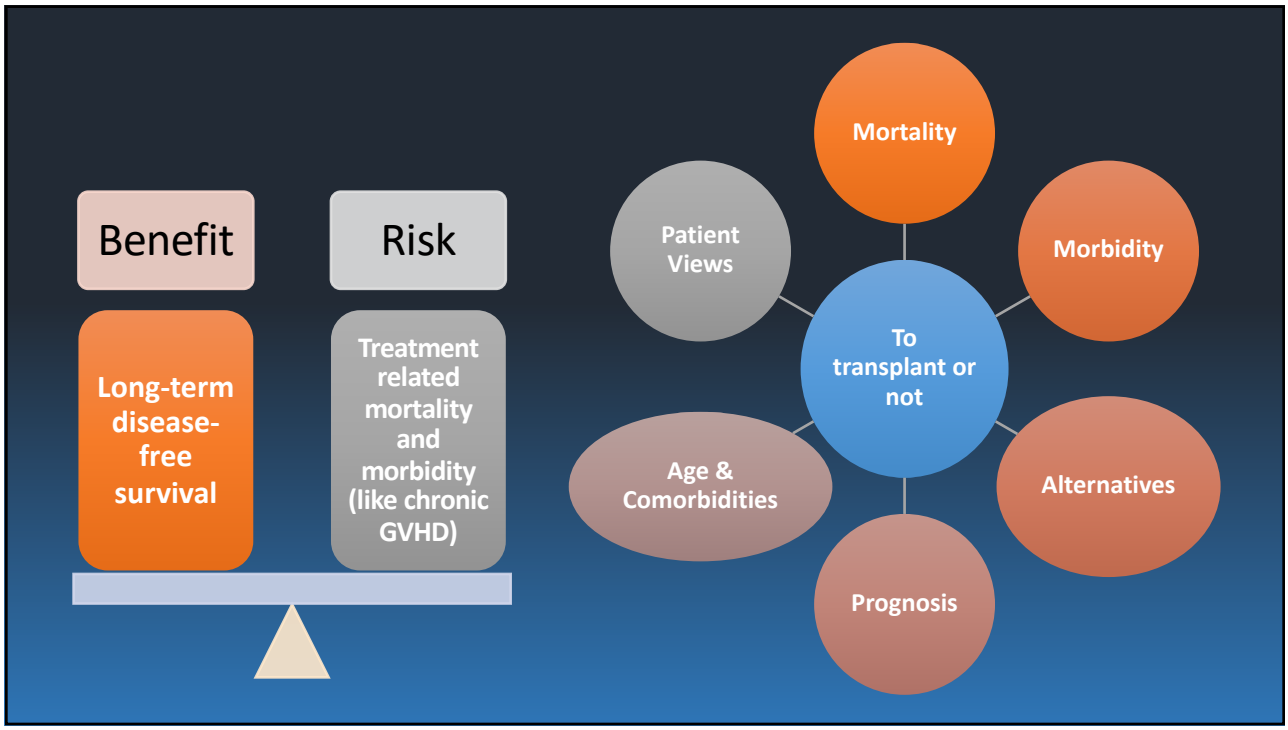
Older patients are most in need, and are increasingly undergoing stem cell transplantation (SCT)

- But Outcomes Need to be Improved

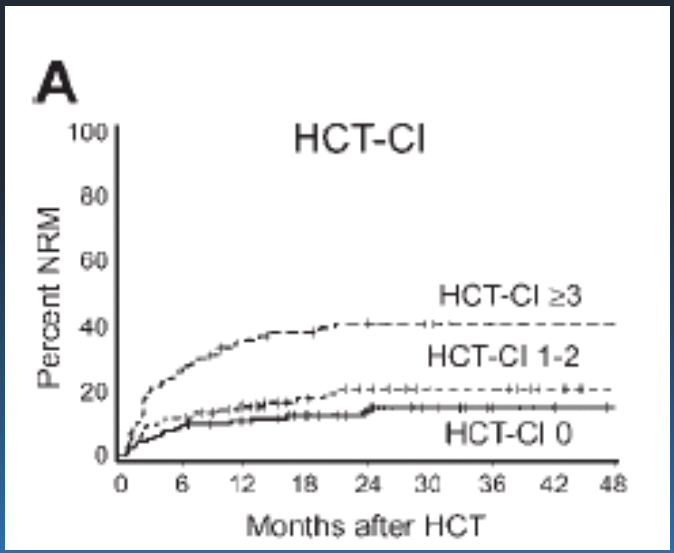
9

When? What determines likelihood of success?





Other health issues predict for transplant-related mortality



Sorror et al Blood. 2004; 104:961-968

Geriatric Assessment: Predicts for Transplant-Related Mortality

	Total Population			50-59 Years			60+ Years		
Variable	HR	95% CI	*P*	HR	95% CI	*P*	HR	95% CI	*P*
GA Variables									
IADL Impairment	2.4	1.6-3.6	<.001	1.9	1.1-3.2	.03	3.3	1.8-6.1	<.001
Slow Walk Speed	1.8	1.1-2.8	.01	1.2	.6-2.3	.66	3.3	1.7-6.4	.001
Low Mental Health	1.7	1.1-2.5	.01	1.6	.9-2.6	.10	1.9	1.0-3.5	.04
Low Albumin	1.5	.9-2.5	.09	1.2	.6-2.6	.60	2.6	1.3-5.5	.01
High CRP	2.6	1.6-4.2	<.001	1.9	.9-3.8	.07	3.3	1.6-6.7	.001

IADL = Instrumental activities of daily living
HR = hazard ratio
CI = Confidence Interval
P = P-value

Muffly L,Haematologica, 2014 13

Key Points

Older patients are most in need and are increasingly undergoing SCT

- But Outcomes need to be improved

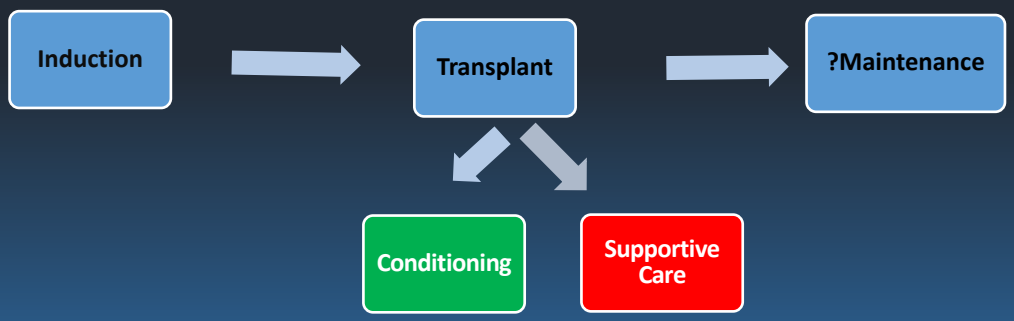
Factors predicting likelihood of success (prognostic factors)

- Other health concerns at time of transplant (comorbidities)
- Geriatric assessment:
  - ability to plan and do daily activities independently
  - cognitive status (ability to process information)

14

How do we improve outcomes in older patients?

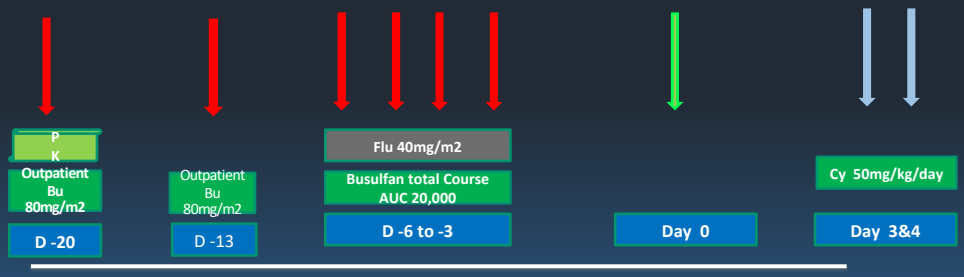
How do you improve outcomes



Main Idea

You can reduce toxicity and related mortality of an intense conditioning regimen given before transplant by simply giving it over a longer period of time

Fractionated* Busulfan (f-bu) Regimen



Even longer, intense, myeloablative schedule of busulfan to reduce toxicity, GVHD and mortality

*Fractionated means dividing total dosage given to patient into several separate dosages

Patient Characteristics

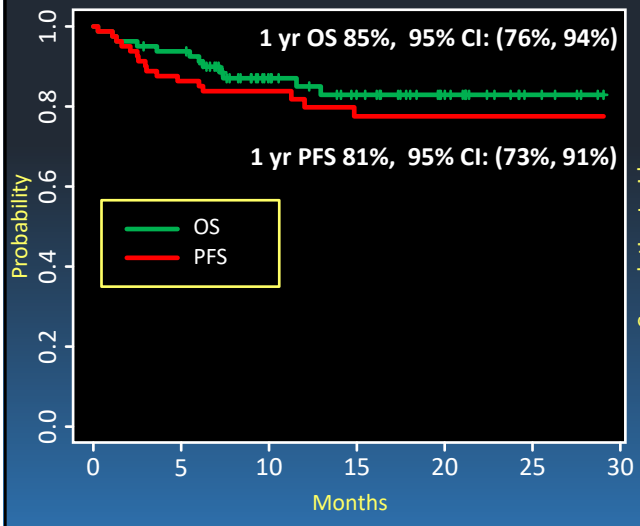
	N=78	%
Age, median (range)	61	(39-70)
Diagnosis		
AML(CR/Cri/Not CR)	19(10/3/6)	24%
MDS(R-IPSS high/V.High)	21(14)	27%
MPD (DIPSS Plus Int 2/High)	31(14/11)	40%
Myeloma/CML/ALL	1/3/3	9%
Disease Risk Index		
High or Very high	18	23%
Low/Intermediate	60	77%

	N=78	Percentage
Donor		
Matched Related	29	37%
Matched Unrelated	49	63%
Comorbidity Score		
0	11	14%
1-2	34	44%
3 or more	33	42%
Cell source		
Peripheral blood	73	94%

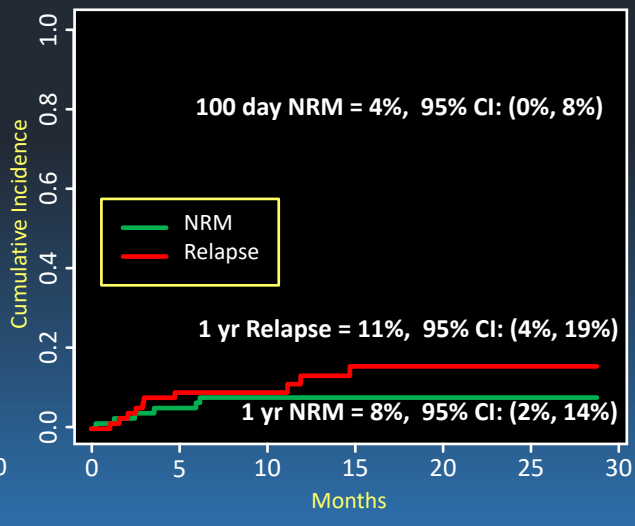
19

Popat et al TCT20 abstract# 6

Overall and Progression-Free Survival

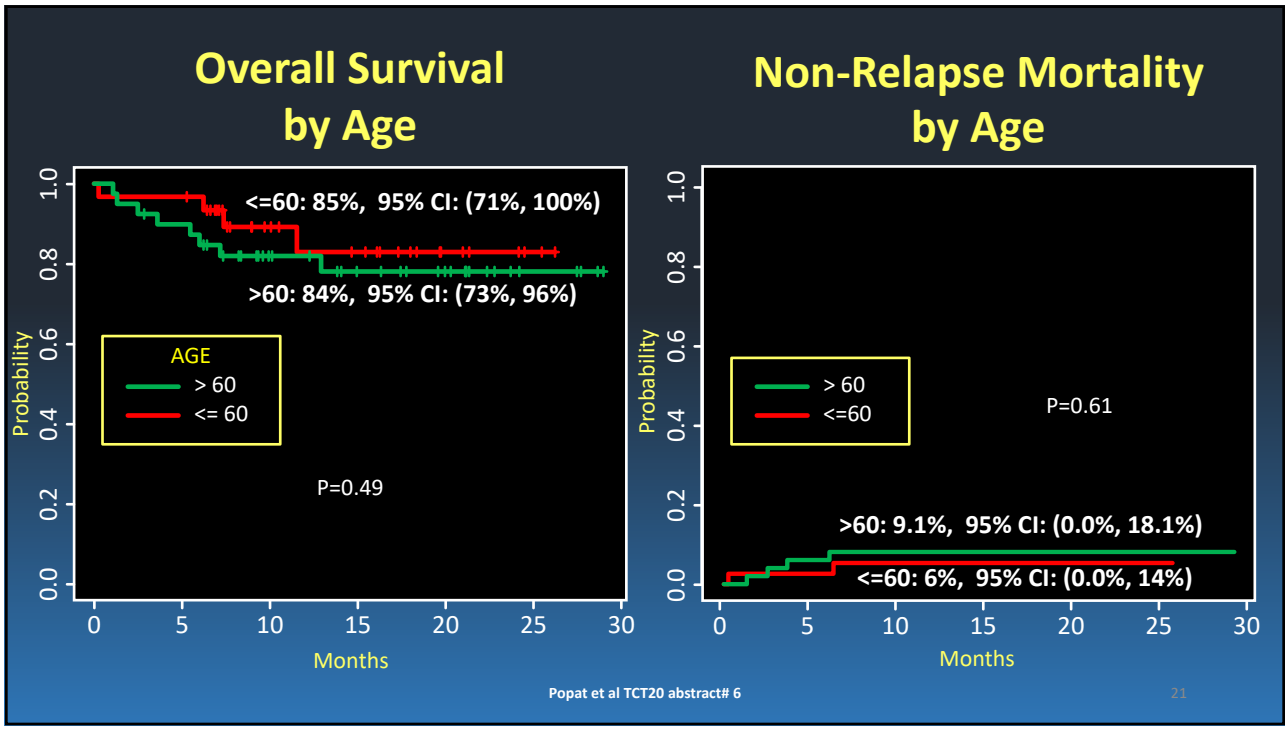


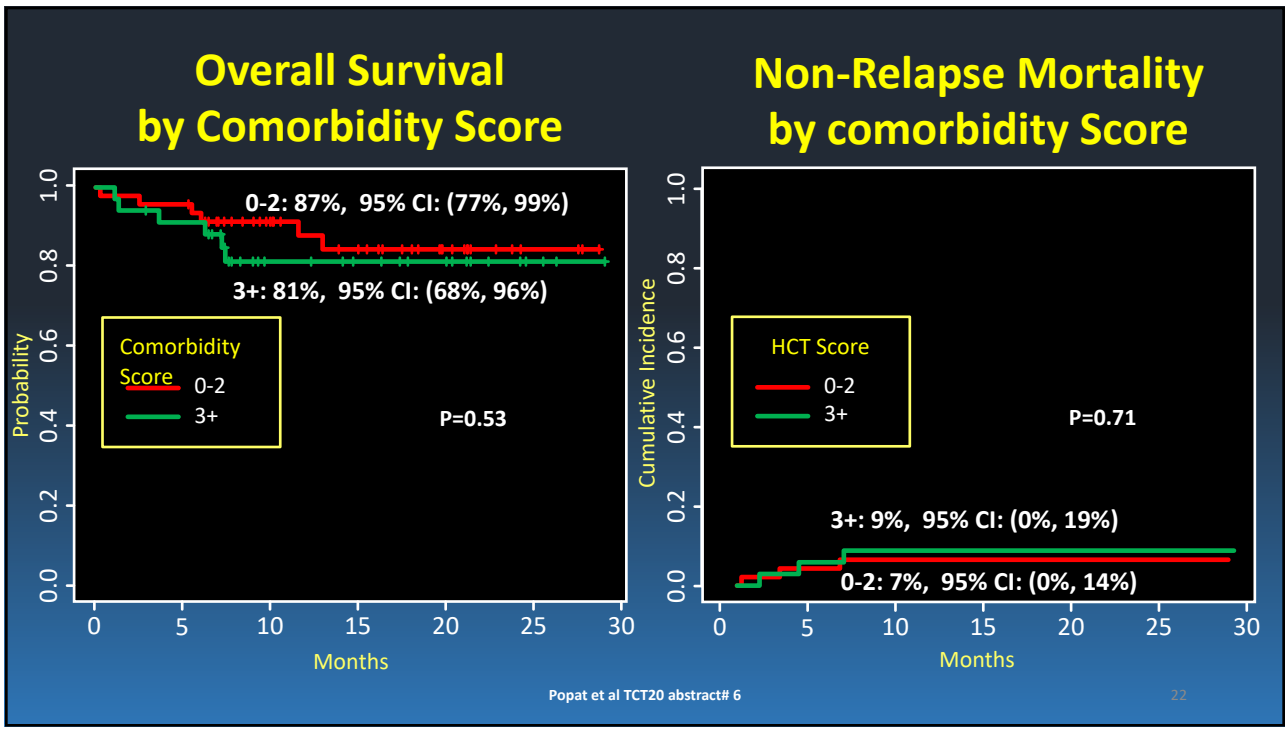
Non-Relapse Mortality (NRM) and Relapse



Popat et al TCT20 abstract# 6

20


Overall Survival by Age
<=60: 85%, 95% CI: (71%, 100%)
>60: 84%, 95% CI: (73%, 96%)
AGE
> 60
<= 60
P=0.49
Probability
Months
Non-Relapse Mortality by Age
> 60
<=60
P=0.61
>60: 9.1%, 95% CI: (0.0%, 18.1%)
<=60: 6%, 95% CI: (0.0%, 14%)
Probability
Months
Popat et al TCT20 abstract# 6
21


Overall Survival by Comorbidity Score
0-2: 87%, 95% CI: (77%, 99%)
3+: 81%, 95% CI: (68%, 96%)
Comorbidity Score
0-2
3+
P=0.53
Probability
Months
Non-Relapse Mortality by comorbidity Score
HCT Score
0-2
3+
P=0.71
3+: 9%, 95% CI: (0%, 19%)
0-2: 7%, 95% CI: (0%, 14%)
Cumulative Incidence
Months
Popat et al TCT20 abstract# 6
22

Key Points

Older patients are most in need and are increasingly undergoing SCT
- But Outcomes are inferior

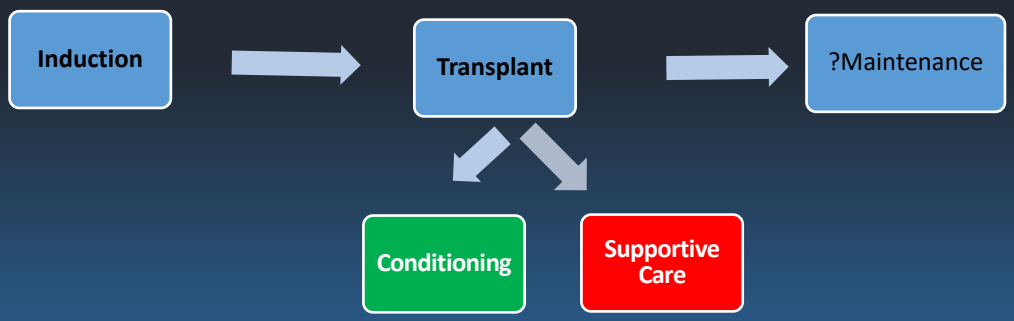
Current standard of Care for Older Patients
- Flu/Mel compared to Flu/Bu
- Low relapse but high NRM with Flu/Mel

Prognostic Factors
- Comorbidity Index
- Geriatric assessment: IADL, Impaired cognition

How do you improve outcomes in older patients?
- **Better conditioning regimen:**
  - ? fractionated busulfan regimen

23

How do you improve Outcomes



How do we further improve outcomes?

Can we redesign a transplant program for older patients, rather than modify what we do for younger patients?

Should We Consider Problems Of Aging?

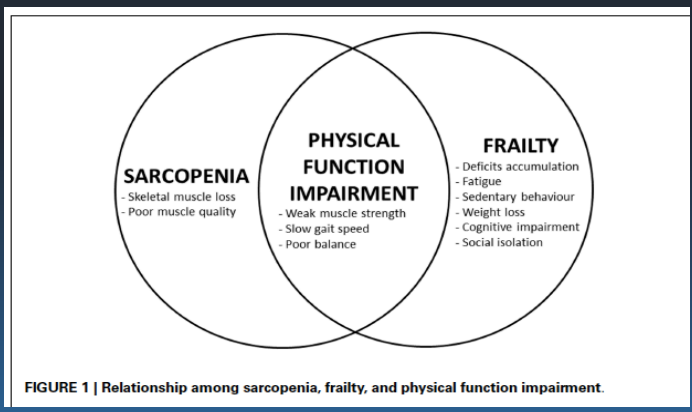


FIGURE 1 | Relationship among sarcopenia, frailty, and physical function impairment.

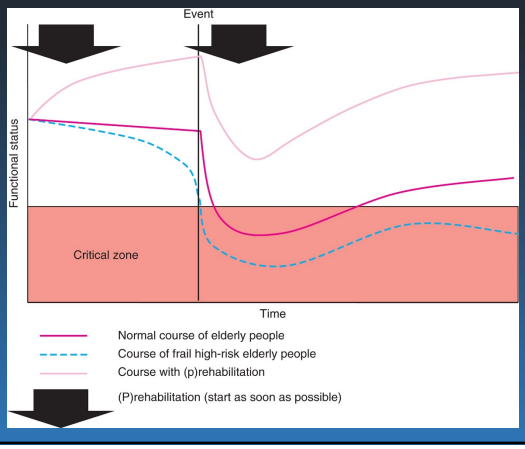
Popat et al TCT20 abstract # 65

26

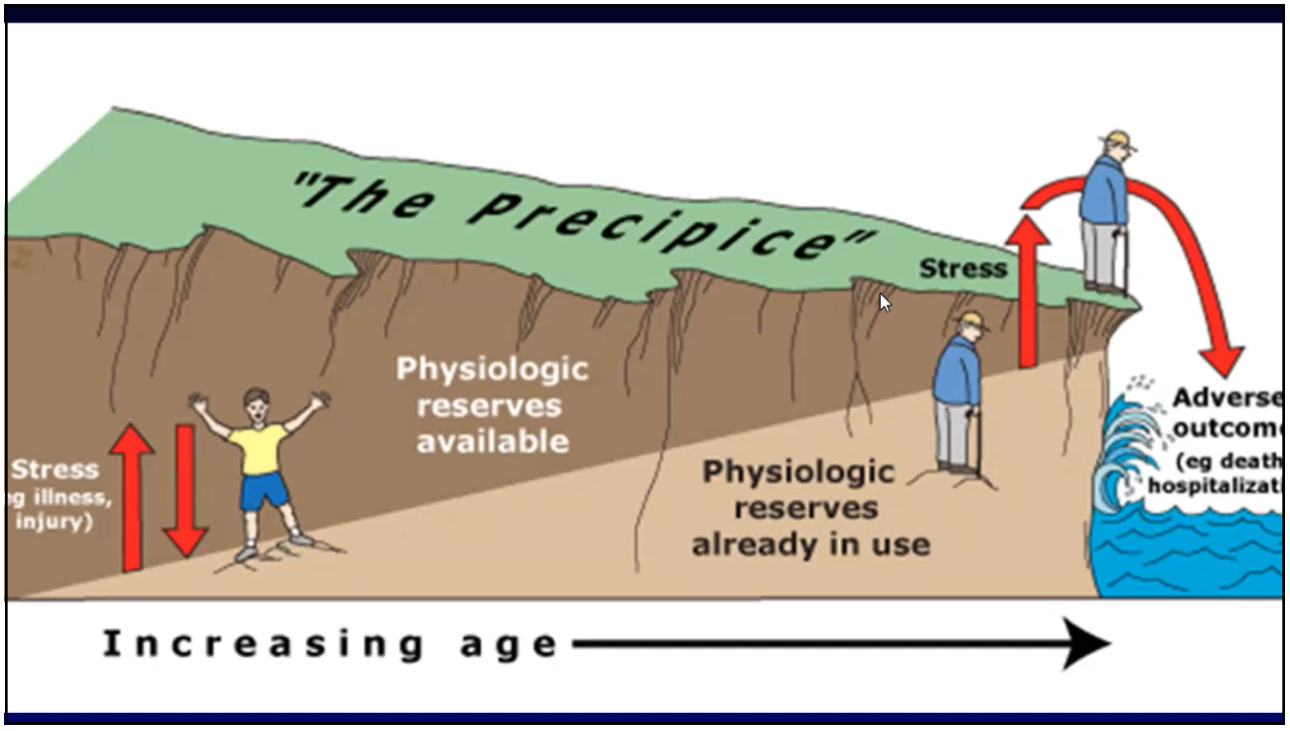
Transplant

Enhanced Recovery after ~~Surgery~~ is a multimodal, evidence-based ~~perioperative~~ *Transplant* care pathway developed to improve recovery for patients undergoing major ~~surgery~~.

Transplant



ERAS®USA
ERAS® Society USA Chapter



Enhanced Recovery Stem Cell Transplant (ER-SCT)

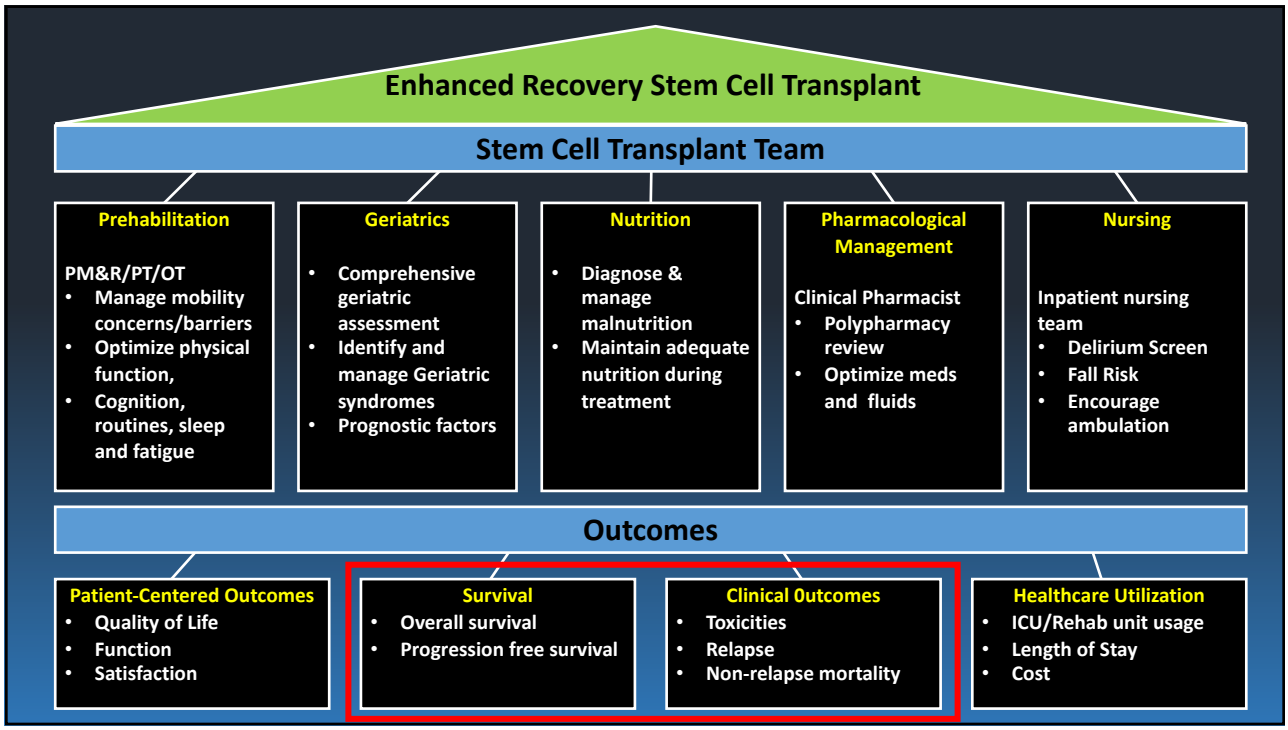
- Goals:
  - Initiate multimodal care early in patients who are 65 or older to
    - Improve physiological reserve
    - Empower patients to participate in their care and well-being
    - Diagnose and optimize chronic medical conditions
  - Improve transplant outcomes

Popat et al TCT20 abstract # 65 29

Enhanced Recovery Stem Cell Transplant (ER-SCT)

- Program roll-out October 1, 2017 after a year of planning
- Multidisciplinary Effort
  - Physical Medicine & Rehabilitation physicians, Physical Therapy, Occupational Therapy
  - Dietician
  - Clinical Pharmacists
  - Stem cell transplant advanced practice providers
  - Stem cell transplant registered nurses
  - Geriatrician

Popat et al TCT20 abstract # 65 30



Inpatient Management: Some interventions

- Motivate and encourage patients to
  - exercise
  - to perform
    - activities of daily living
    - instrumental activities of daily living
- Initiative to prevent falls and monitor for delirium
- Reduce default fluid rate
- No premeds for blood products
- Curtail opioid use
- Separate order sets for elderly with age-appropriate meds and dose
- Allow regular diet

Popat et al TCT20 abstract # 65

32

Does it make a difference?
What is the evidence?

Popat et al TCT20 abstract # 65

33

Enhanced Recovery (ER-SCT)
First Year Experience

Enhanced Recovery Group

- Between 10/1/2017 – 9/30/2018
- 64 patients were eligible
- Age ≥ 65 years
- 57 patients (89%) enrolled into ER-SCT
- All 64 included in this analysis

Control Group

- Between 1/1/15 – 9/30/17
- 140 patients were eligible
- Age ≥ 65 years
- All 140 included

Popat et al TCT20 abstract # 65

34

Patient Characteristics

	ER-SCT N=64	Controls N=140	P
Sex:			0.7
• Female	26 (41)	53 (38)	
• Male	38 (59)	87 (62)	
Age	68 (65-74)	67 (65-79)	0.03
• median >70	12 (19)	24 (17)	0.8
Diagnosis			0.5
• AML/MDS	45 (70)	108 (77)	
• ALL	3 (5)	5 (4)	
• CML / MPD	10 (16)	16 (11)	
• CLL	4 (6)	3 (2)	
• Lymphoma	2 (3)	4 (3)	
• Myeloma	0	2 (1)	
• Aplastic Anemia	0	2 (1)	

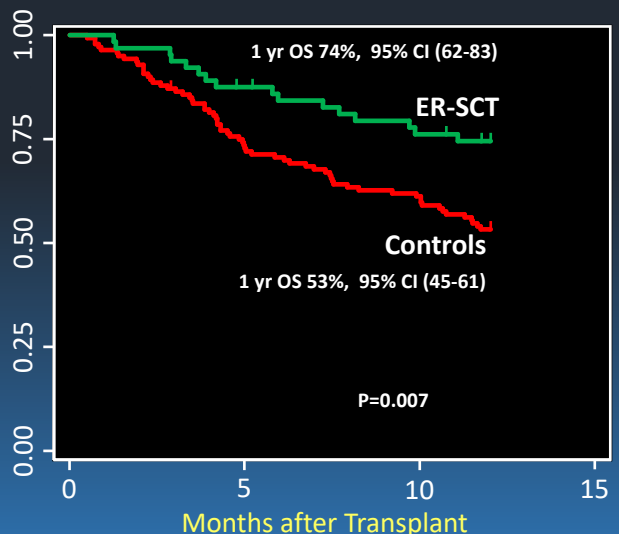
	ER-SCT N=64	Controls N=140	P
Prep & GVH prophylaxis*			
Post Cyclophaosphamide			0.001
Fractionated-Busulfan+Flu	17 (27)	18 (13)	
Melphalan+Flu	28 (44)	17 (12)	
Tacrolimus/Methotrexate			
Melphalan + Fludarabine	9 (14)	24 (17)	
Busulfan 4 or Other + Flu	9 (14)	80 (57)	

*Conditioning Regimen and GVHD prophylaxis
1 additional patient had post-transplant cyclophosphamide and 4 days busulfan in each group

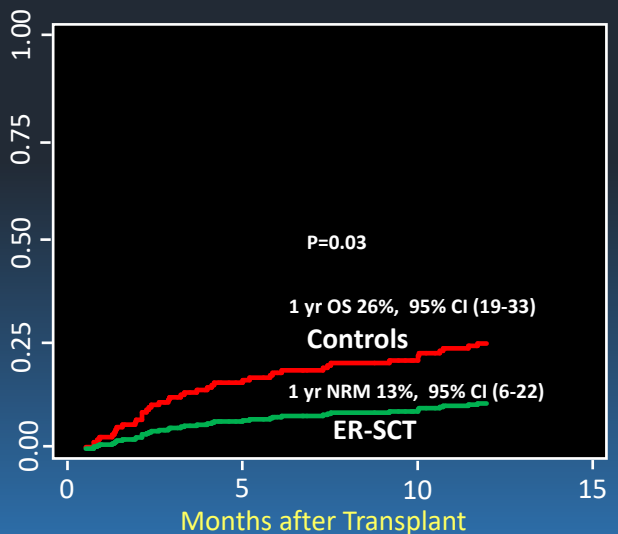
Popat et al TCT20 abstract # 65

35

Overall Survival



Non-Relapse Mortality



Popat et al TCT20 abstract # 65

36

Key Points

Older patients are most in need, and are increasingly undergoing stem cell transplantation (SCT)

- but outcomes need to be improved

Factors predicting likelihood of success (Prognostic Factors)

- Other health concerns at time of transplant (comorbidities)
- Geriatric assessment:
  - ability to plan and do daily activities independently
  - Cognitive status (ability to process information)

37

Key Points

- How do you improve outcomes in older patients?
  - Better conditioning regimen:
    - fractionated busulfan regimen
  - Better supportive care:
    - Enhanced recovery in stem cell transplantation program (ER-SCT) to
      - maintain patient's ability to physically recover from treatment (physiological reserve) despite older age
      - reduce non-relapse mortality

38

Thank You

39

BMTinfonet.org
BLOOD & MARROW TRANSPLANT INFORMATION NETWORK
SURVIVORSHIP SYMPOSIUM

Questions?

Uday Popat MD

Celebrating a Second Chance at Life Survivorship Symposium 2022

bmtinfonet.org ✦ help@bmtinfonet.org ✦ 847-433-3313

BMTinfonet.org
BLOOD & MARROW TRANSPLANT INFORMATION NETWORK
SURVIVORSHIP SYMPOSIUM

Let Us Know How BMT InfoNet Can Help YOU!

Visit our website: bmtinfonet.org

Email us: help@bmtinfonet.org

Give us call: 888-597-7674

We're here to help every step of the way!