

Early Identification Matters: **Feasibility and Early Outcomes** **of a Nutrition and Exercise Program** **in Allogeneic vs. Autologous Stem** **Cell Transplant Recipients**

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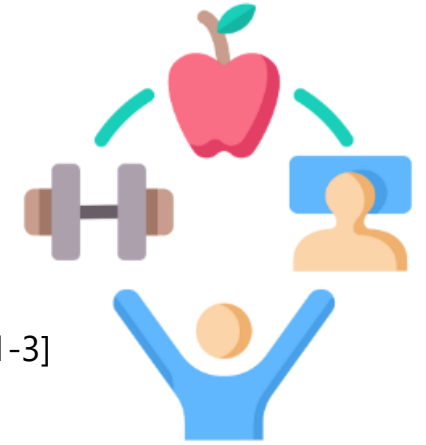
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Rationale

Nutrition and exercise are known to improve nutritional, functional and health-related quality of life outcomes both before and after stem cell transplantation ^[1-3]



Allogeneic SCT (AlloSCT) recipients experience greater treatment complexity compared to autologous SCT (AutoSCT) ^[4-6]

It was unclear whether a single prehabilitation model adequately meets the needs of both groups.



Aims

Feasibility

- Recruitment
- Participation
- Attrition
- Fidelity

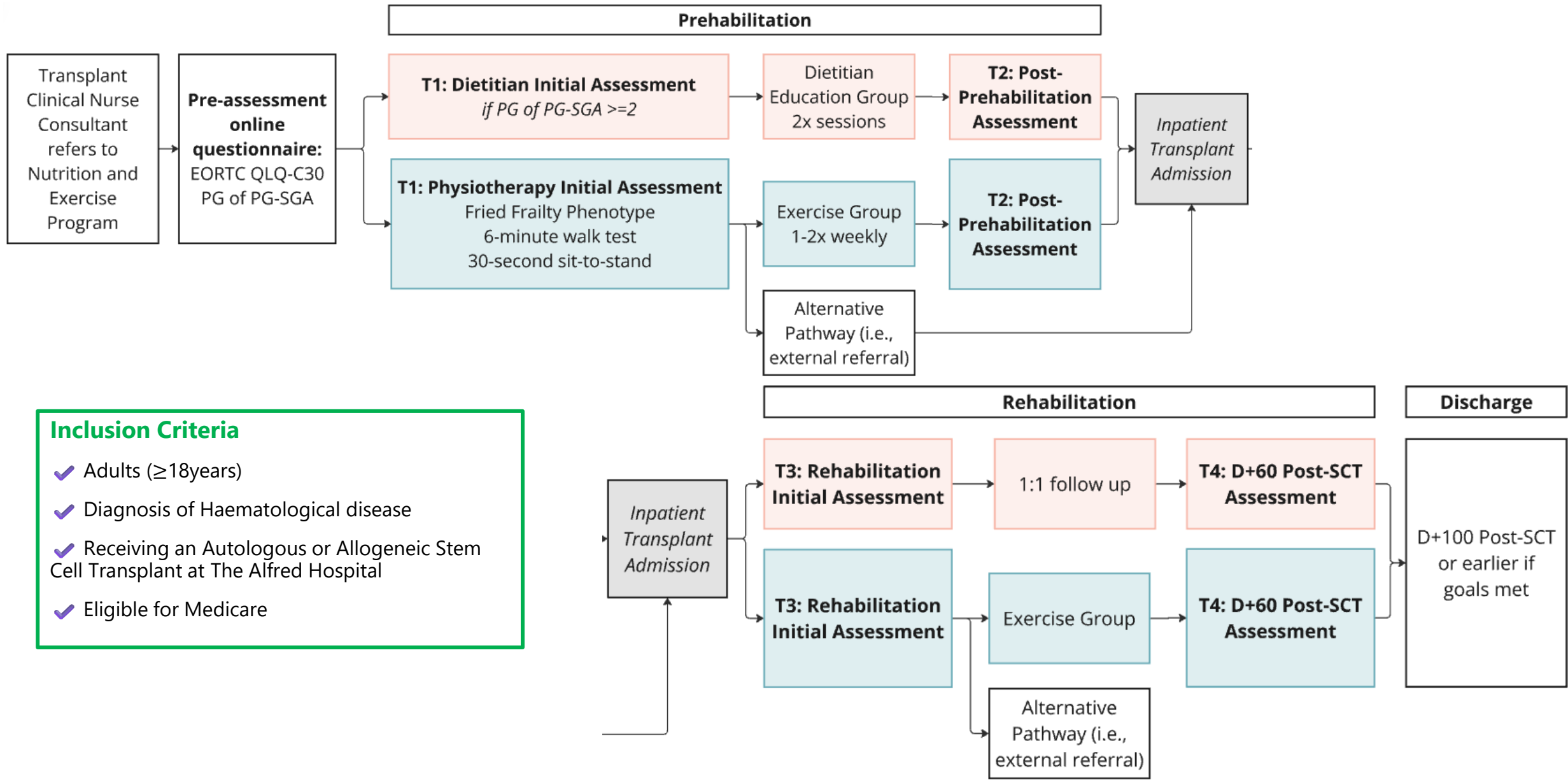
Clinical Outcomes

- Frailty
- Functional exercise capacity
- Malnutrition
- Health related quality of life

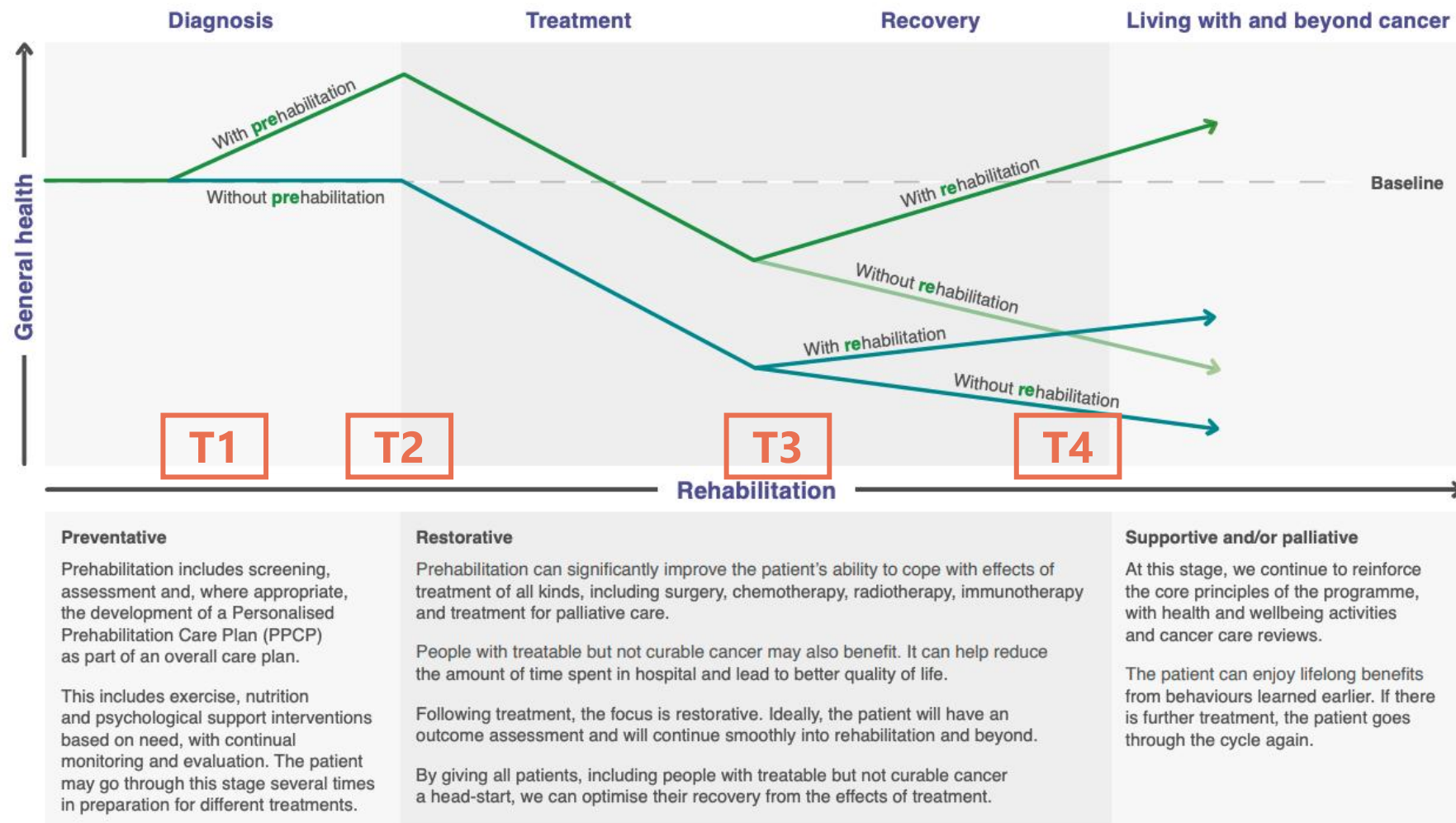
Health Service Usage

- Acute length of stay
- Unplanned readmission prior to day 100 post-SCT
- Time to return to rehabilitation post-discharge

Methods

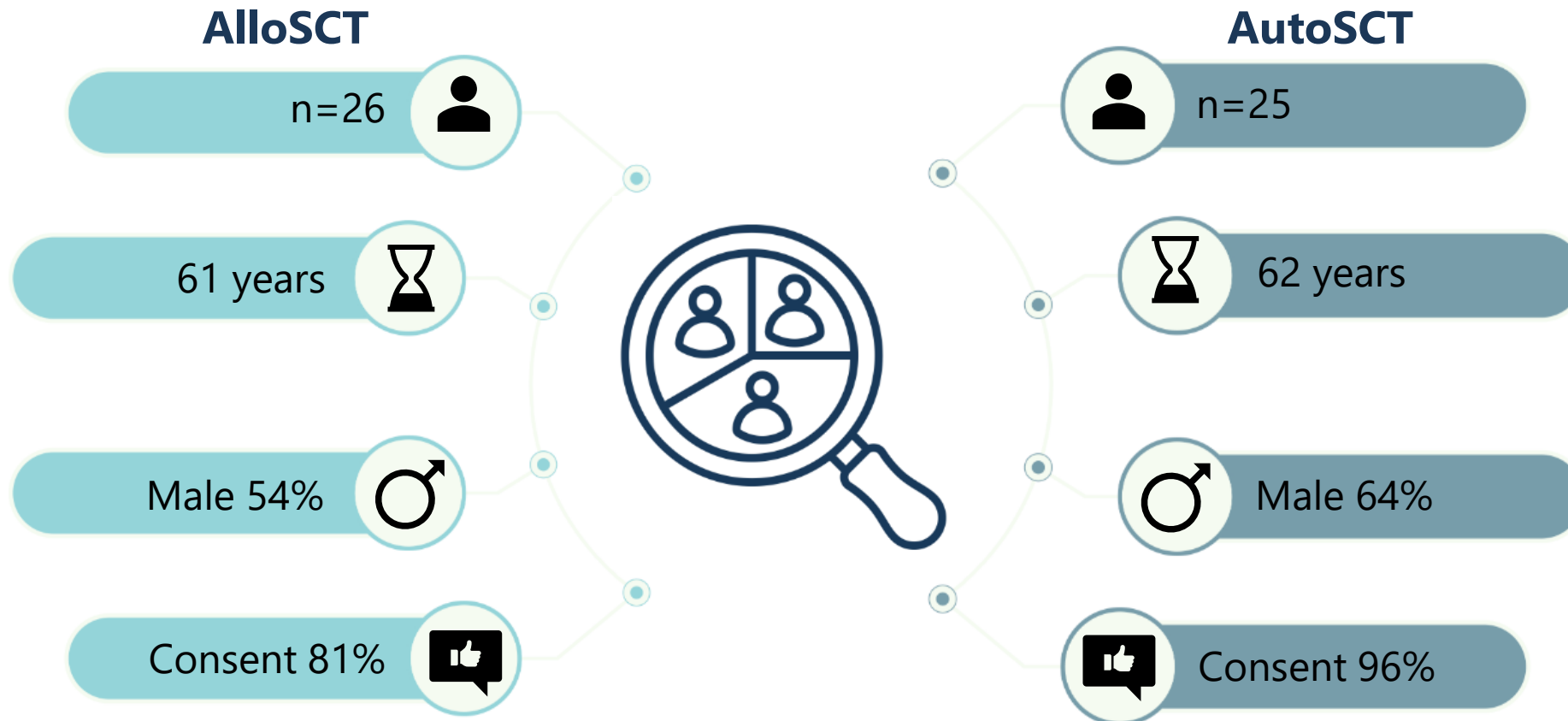


IMPROVING CANCER CARE BEFORE TREATMENT EVEN STARTS



Source: Macmillan Cancer Support (2025) Prehabilitation for people with cancer: clinical and implementation guidelines

Results

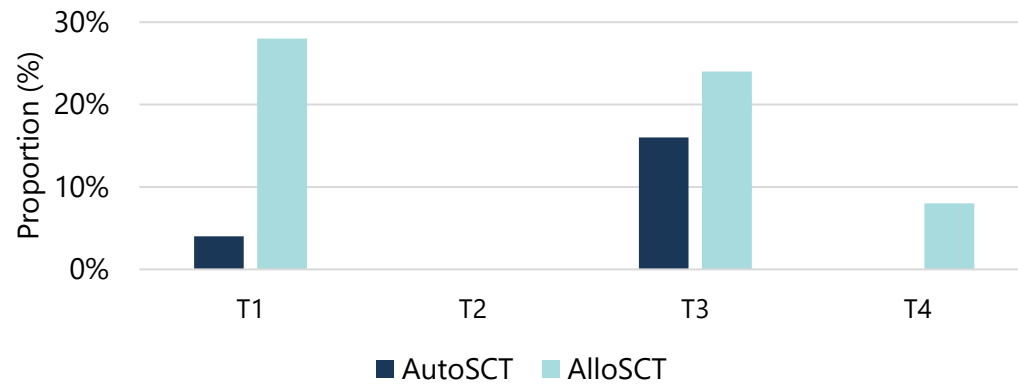


Feasibility & Health Service Usage

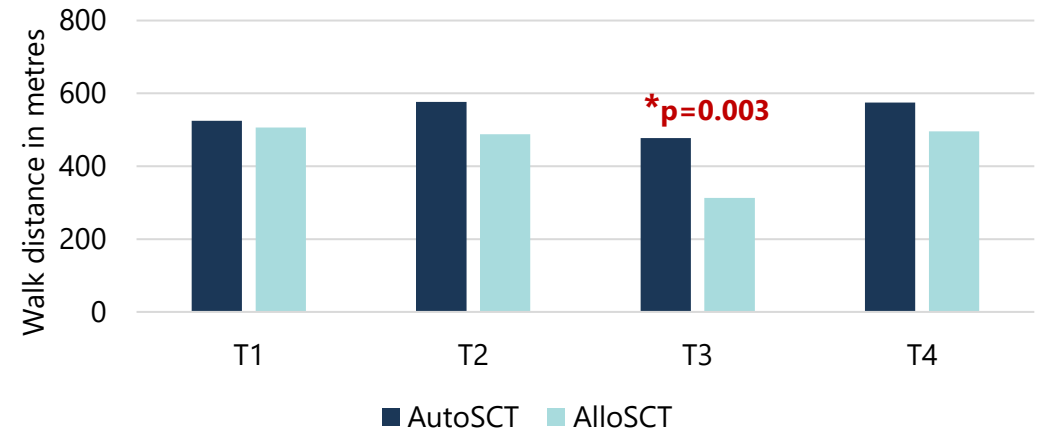
Domain	AutoSCT (n=26)	AlloSCT (n=25)	p-value
Days from date of referral to SCT admission, median [IQR]	44 days [27-70]	27 days [27-50]	0.047
Days from discharge to rehab assessment, median [IQR]	9 days [4-11]	21 days [4-24]	0.052
Required 1 ICU admission during SCT admission, n (%)	4 (15%)	6 (24%)	0.44
Required ≥ 2 ICU admissions during SCT admission, n (%)	0 (0%)	4 (16%)	0.070
Acute LOS, median [IQR]	19 days [16-21]	30 days [26-46]	<0.001
Unplanned readmission before day-100 post-SCT, n (%)	1 (4%)	10 (40%)	0.007
ICU: Intensive Care Unit; denotes individuals who required higher acuity care than was available on the SCT ward.			
LOS: length of stay; refers the total number of days attributable to the admission for SCT, does not include cumulative days from other related or unrelated admissions.			

Clinical Outcomes

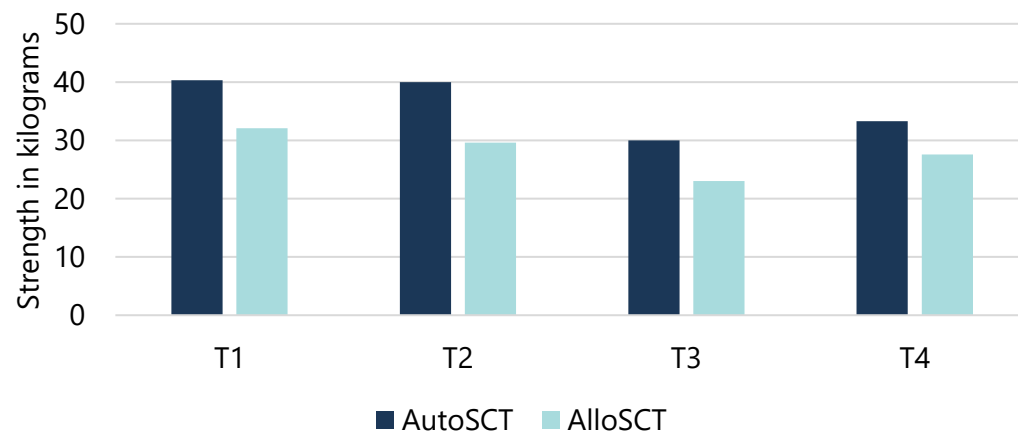
A. Proportion of individuals classified as Frail (Score: ≥ 3) or Pre-Frail (Score: 1-2)



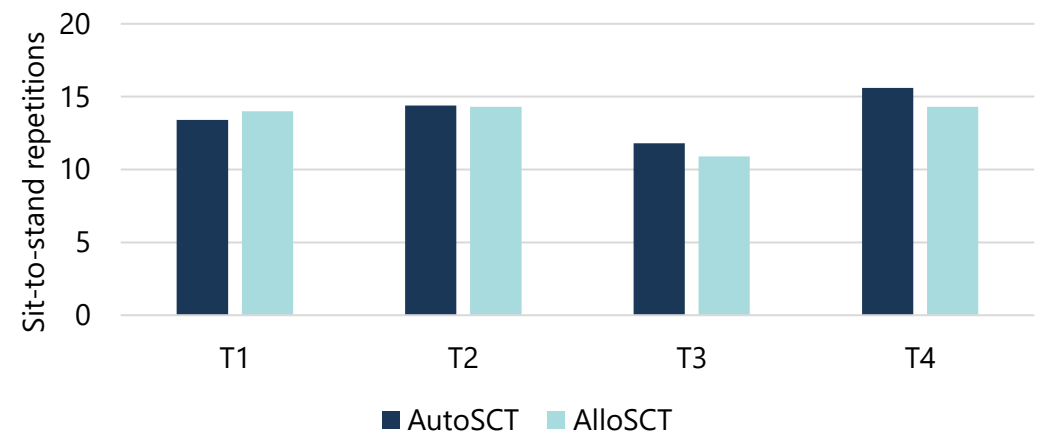
B. Average six-minute walk distance (metres)



C. Average hand-grip strength (kilograms)



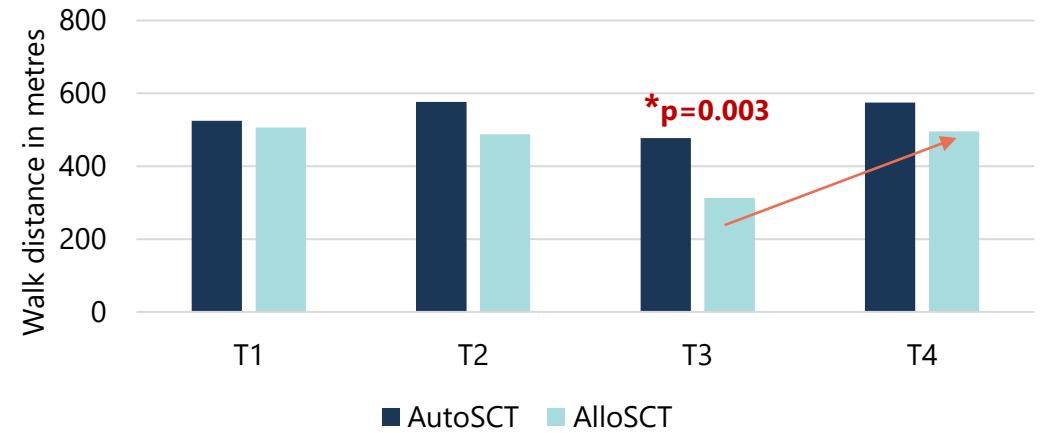
D. Average 30-second sit-to-stand repetitions



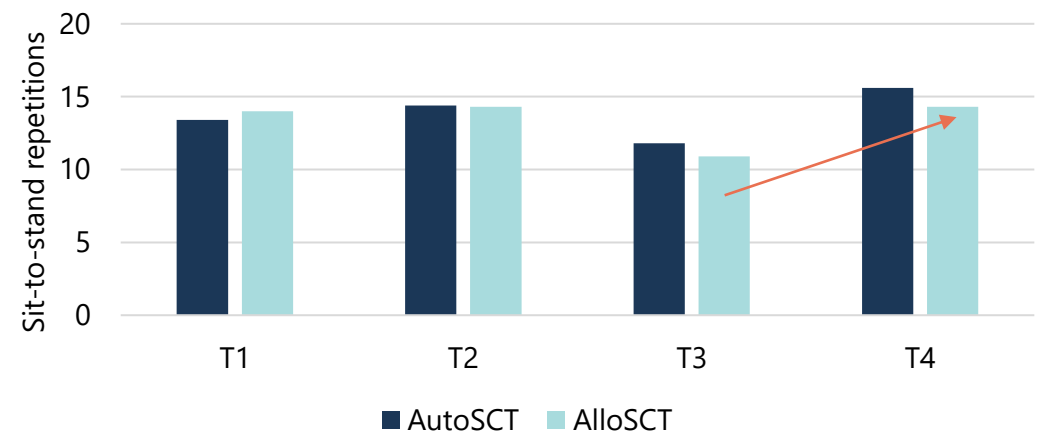
Clinical Outcomes



B. Average six-minute walk distance (metres)



D. Average 30-second sit-to-stand repetitions



Concluding observations

- AlloSCT recipients demonstrated poorer early trajectories and greater service utilisation.
- Varying needs between AlloSCT and AutoSCT could be catered for within the combined program.
- Frailty and functional exercise deficits are amenable to exercise and nutrition interventions.
- Early optimisation may allow patients to enter transplant with greater functional reserve, reducing the likelihood of severe functional impairment during recovery.
- Supports the embedment of prehabilitation models into care pathways to better meet the needs of higher-risk transplant populations.

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Clinicians: Marina Nguyen & Alexis Broj (Dietitian); Alistair Stewart (Allied Health Assistant)

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Alfred Cancer Executive

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Program delivery

Marina Nguyen & Alexis Broj (Dietitian)

Alistair Stewart (Allied Health Assistant)

Steve Friel (Acting Deputy Director of Allied Health – Cancer Programs)

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References

1. Knols RH, de Bruin ED, Uebelhart D, Aufdemkampe G, Schanz U, Stenner-Liewen F, et al. Effects of an outpatient physical exercise program on hematopoietic stem-cell transplantation recipients: a randomized clinical trial. *Bone Marrow Transplantation*. 2011;46(9):1245-55.
2. Baumann FT, Kraut L, Schüle K, Bloch W, Fauser AA. A controlled randomized study examining the effects of exercise therapy on patients undergoing haematopoietic stem cell transplantation. *Bone Marrow Transplantation*. 2010;45(2):355-62.
3. Abo S, Denehy L, Ritchie D, Lin K-Y, Edbrooke L, McDonald C, et al. People With Hematological Malignancies Treated With Bone Marrow Transplantation Have Improved Function, Quality of Life, and Fatigue Following Exercise Intervention: A Systematic Review and Meta-Analysis. *Physical Therapy*. 2021;101(8):1.
4. Dillon HT, Saner NJ, Ilsley T, Kliman DS, Foulkes SJ, Brakenridge CJ, et al. Preventing Allogeneic Stem Cell Transplant–Related Cardiovascular Dysfunction: ALLO-Active Trial. *Circulation*. 2025:329-08.
5. Regazzoni R, Ferrante S, Morengi E, Lopane D, Pastore M, Cattani D, et al. Evolution of Nutritional Status in Patients Undergoing Autologous and Allogeneic Hematopoietic Cell Transplantation or CAR-T Therapy: A Retrospective Observational Study. *Cancers*. 2025;17(1):79.
6. Baumann FT, Zopf EM, Nykamp E, Kraut L, Schüle K, Elter T, et al. Physical activity for patients undergoing an allogeneic hematopoietic stem cell transplantation: benefits of a moderate exercise intervention. *European Journal of Haematology*. 2011;87(2):148-56.