

Supplemental Table 1: Geriatric Assessment Tools

Domains	Geriatric Assessment Tools*	Additional Provider Directed Assessments	
		Tools	Provider Performing
Comorbidity	OARS physical health	HCT-CI	APP
		ID evaluation	ID
Patient-Reported Functional Status	KPS by patient MOS physical health MOS social activities IADL Falls in last 6 months SF-36		
Performance or Provider-Based Functional Status	Timed up-and-go Handgrip strength 4-meter walk test	Single leg stance Range of motion Posture Strength testing 6-minute walk test	PT/OT
		KPS by provider	APP, MD
Social Support	MOS social support	Transportation Caregiver Caregiver contract Insurance coverage	SW, APP
Cognition	BOMC	MoCA	GO
Psychological	MHI-17 SF-36 mental health	Substance abuse GDS	GO, SW
Nutritional Status	Body mass index Weight loss	ASPEN Malnutrition MST MUST	Nutrition
Polypharmacy	List of medications	Beers Criteria	GO, MD
Biomarkers		C-Reactive Protein Albumin	MD

*Tools from the cancer-specific geriatric assessment by Hurria et al. *JCO* 2011; 29(10):1290-1296

Abbreviations: ASPEN = American Society for Parenteral and Enteral Nutrition; BOMC = Blessed-Oriented-Memory Concentration; GDS = Geriatric Depression Scale; HCT-CI = Hematopoietic Cell Transplantation-Specific Comorbidity Index; IADL = Independent Activities of Daily Living; KPS = Karnofsky Performance Status; MHI-17 = Mental Health Inventory-17; MoCA = Montreal Cognitive Assessment; MOS = Medical Outcomes Study; MST = Malnutrition Screening Tool; MUST = Malnutrition Universal Screening Tool; OARS = Older Americans Resources and Services; SF-36 = 36-Item Short-Form Health Survey. Providers: APP = Transplant advanced practice practitioner, GO = Geriatric oncology physician; ID = Infectious disease physician, MD = Transplant physician; Nutrition = Nutritionist, PT/OT = Physical Therapy/Occupational therapy; SW = Social work.

Supplemental Table 2: Characteristics and Feasibility of Patient-Reported Measures from the Multidisciplinary Clinic

Feasibility Characteristic	Allogeneic Candidates (2013-2018)	Autologous Candidates (2015-2018)
Completed Health Status Survey, n	139	85
Paper Survey	57 (41%)	29 (34.1%)
Electronic Survey	82 (59%)	56 (65.9%)
Completed SF-36, n	135	84
Paper Survey	50 (37%)	27 (32.1%)
Electronic Survey	85 (63%)	57 (67.9%)
Median Time to Complete Electronic Health Status Survey, n	79	54
	14m 50s	15m 46s
Median Time to Complete Electronic SF-36, n	83	56
	14m 08s	15m 55s
Preference for Computer-Based Survey Over Paper-Based Survey	88/116 (75.9%)	47/78 (60.3%)
Among Those Who Completed Paper Survey	25/41 (61%)	11/24 (45.8%)
Among Those Who Completed Computer Survey	63/75 (84%)	36/54 (66.7%)
Computer Skill Level, n	118	77
None	10 (8.5%)	14 (18.2%)
Beginner	19 (16.1%)	20 (26%)
Intermediate	72 (61%)	40 (51.9%)
Advanced	17 (14.4%)	3 (3.9%)
Patient Perspectives on Health Status Survey		
Survey Length, n	136	81
Just Right	125 (91.9%)	70 (86.4%)
Too Long	10 (7.4%)	11 (13.6%)
Too Short	1 (<1%)	0 (0%)
Ease of Survey Completion, n	110	70
Very Easy	67 (60.9%)	30 (42.9%)
Easy	36 (32.7%)	30 (42.9%)
Difficult	3 (2.7%)	5 (7.1%)
Very Difficult	4 (3.7%)	5 (7.1%)
Questions Upsetting	3/135 (2.2%)	1/82 (1.2%)
Questions Difficult to Understand	14/138 (10.1%)	10/83 (12%)

Supplemental Table 3: Geriatric Vulnerabilities Among Patients Meeting Age Requirement to Attend the Multidisciplinary Clinic

	Autologous Candidates ≥70 years old (n=52)	Allogeneic Candidates ≥ 60 years old (n=140)	p-value
Age in years, median (range)	72.5 (70-83)	66.8 (60-81)	<0.001
Diagnosis	PCD: 33 (63.5%) NHL: 19 (36.5%)	AML: 65 (46.4%) MDS: 27 (19.3%) MPD: 16 (11.4%) NHL: 14 (10%) ALL: 11 (7.9%) Other: 7 (5%)	-
IADL, n	50	128	
Median (range)	14 (6-14)	14 (4-14)	0.094
Impaired (<14)	24 (48%)	47 (36.7%)	0.18
HCT-CI, n	52	131	
Median (range)	2.5 (0-10)	2 (0-7)	0.43
Score ≥ 3	25 (48.1%)	59 (45%)	0.74
Self-Rated KPS, n	48	130	
Median	90 (40-100)	90 (50-100)	0.91
BOMC, n	51	139	
Median	4 (0-17)	4 (0-17)	0.089
≥ 6	19 (37.3%)	44 (31.7%)	0.49
≥ 11	6 (11.8%)	8 (5.8%)	0.21
4-meter walk test, n	50	135	
Frail [¶] (%)	11 (22%)	17 (12.6%)	0.16
Falls in the Last 6 months	6/46 (13%)	19/118 (16.1%)	0.49
Weight loss > 10% in Last 6 Months	7/45 (15.6%)	32/128 (25%)	0.22
Number of Prescribed Medications, n	40	110	
Median (range)	5 (0-14)	5 (0-20)	0.66
Polypharmacy (>4 medications)	23/45 (51.1%)	60/110 (54.5%)	0.73
MOS Social Support Survey, n	45	122	
Median (range)	97.9 (66.7-100)	97.9 (47.9-100)	0.71
Mental Health Index-5, n	46	125	
Median (range)	88 (56-100)	88 (52-100)	0.98
Score ≤ 76	10 (21.7%)	27 (21.6%)	1

[¶]Frailty is as described in Table 3.

Abbreviations: ALL = acute lymphoblastic leukemia; AML = acute myeloid leukemia; BOMC = blessed-orientation-memory concentration; CAR-T = chimeric antigen receptor T-cell therapy; HCT-CI = Hematopoietic cell transplantation-specific comorbidity index; IADL = independent activities of daily living; KPS = karnofsky performance status; MDS = myelodysplastic syndrome; MOS = medical outcomes study; MPD = myeloproliferative disease; NHL = non-hodgkin lymphoma; PCD = plasma cell dyscrasia; TOP = Transplant Optimization Program

Supplemental Table 4: Outcomes of Autograft Recipients Age 70 Years and Older During the TOP Multidisciplinary Clinic Era, 2015-2018

	Autograft Recipients
Received Cellular Therapy	31
After Initial Deferral	4
After Declined	0
Age in years, median (range)	70.5 (70-77)
Age \geq 70, %	31 (100%)
Diagnosis	
MM	21 (67.7%)
NHL	10 (32.3%)
HCT-CI score, n	31
Median (range)	2 (0-9)
Score \geq 3	13 (41.9%)
IADL score, n	30
Median (range)	14 (10-14)
IADL < 14	12 (40%)
Regimen	
Melphalan 140 mg/m ²	3 (9.7%)
Melphalan 200 mg/m ²	19 (61.3%)
BEAM	6 (19.3%)
Carmustine/Thiotepa	3 (9.7%)
Outcomes	
Inpatient Deaths During Initial Hospitalization	0 (0%)
Length of inpatient stay in days, median (IQR)	14 (12-16)
Discharge to Nursing Facility By Day +100	3 (9.7%)
Readmission By Day +100	5 (16.1%)
Death within Day +100	1 (3.2%)
1-year Overall Survival	96.8%*
1-year Non-Relapse Mortality	0%

*Excludes 3 patients with less than 1 year of follow-up.

Abbreviations: BEAM = Carmustine, etoposide, cytarabine, melphalan; HCT-CI = HCT-CI = Hematopoietic cell transplantation-specific comorbidity index; IADL = independent activities of daily living; MM = multiple myeloma; NHL = non-Hodgkin lymphoma; TOP = Transplant Optimization Program.

Supplemental Table 5: Allogeneic Transplantation Outcomes in Deferred vs Non-Deferred Patients 60 years and older

Characteristics	Initial Recommendation		
	Proceed (n=72)	Defer (n=13)	p-value
Age in years, median (range)	67 (60 -75)	65.6 (60-71)	0.18
Age \geq 70	18 (25%)	1 (7.7%)	0.28
HCT-CI score, median (range)	1 (0-8)	2 (0-6)	0.34
HCT-CI \geq 3	26 (36.1%)	6 (46.2%)	0.54
Days from Evaluation to Transplant, median (IQR)	34.5 (21-54)	76 (62-89)	<0.001
Length of inpatient stay in days, median (IQR)	14 (13-17)	14 (12-18)	0.74
Events by Day +100			
Discharge to Nursing Facility	1 (1.4%)	1 (7.7%)	0.28
Readmission	41 (56.9%)	11 (84.7%)	0.071
Death	3 (4.2%)	3 (23.1%)	0.043
Events by 1 Year			
1-Year OS	64.1%*	46.2%	0.35
1-Year NRM	21.9%*	38.5%	0.29

*Excludes 8 patients with less than 1 year of follow-up.

Supplemental Figure 1: Time to first readmission within the first 100 days after allogeneic stem cell infusion for patients 60 years and older after first hospital discharge for three cohorts: Pre-TOP (Pre-Transplant Optimization Program Multidisciplinary Clinic, 2005-2012), TOP initial (2013-2014), and TOP modern (2015-2017).

