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## Background

- 20-50% of transplant-eligible patients with multiple myeloma (MM) undergo autologous stem cell transplantation (ASCT).<sup>1,2</sup>
- Little is known about community oncologist barriers to referring patients to hematologists at a Bone Marrow Transplant Center (Center) for consultation.<sup>3</sup>
- Intermountain introduced an MM referral protocol in April 2023, encouraging Intermountain-employed community oncologists to refer all newly diagnosed patients to the Center for consultation by the second first-line induction cycle.
- The study aims were to measure system performance before and after implementation of the referral protocol and to understand community oncology team attitudes and beliefs regarding ASCT and consultation.

## Methods

This was an explanatory, sequential mixed methods study. Pre- and post-implementation comparisons were carried out using hierarchical modeling with a site-level random effect. Adjusted survival outcomes for referred/not referred patients were calculated using the Cox proportional hazards model.

Quantitative (January 2018 to June 2025)

Assessed transplant eligibility per chart review adjudication by MM specialist (patients [n=269])

Characterized MM population demographics including transplant eligibility

Measured variation in key metrics across 9 sites and before/after implementation of the referral protocol, along with survival analysis

Qualitative (June to July 2025)

Conducted key informant interviews with 5 local site teams and the Bone Marrow Transplant Center (n=25)

Performed qualitative content analysis paradigm to elicit implementation determinants

## Results

- 70.2% (189) of patients with MM were deemed transplant eligible; 63% of these patients received ASCT, compared with national estimates of 20-50%.
- Systemwide referral rates increased after implementation from 70% to 76% (adjusted odds ratio [aOR] 2.6 [95% confidence interval {CI} 1.1-6.1]; adjusted for age, sex, Charlson Comorbidity Index [CCI] score); for transplant-eligible patients, the increase was from 84% to 91% (aOR 3.0 [95% CI 0.9-9.8]).
- Transplant-eligible patients who were referred for myeloma expert evaluation had a 73.6% lower hazard of death compared to those who were not referred (adjusted hazard ratio 0.26 [95% CI 0.10-0.72]; adjusted for age, sex, CCI and distance to the Center).

## Referral and Consultation Facilitators

- All community oncologists interviewed identified ASCT as the standard of care for first-line treatment of MM.
- All community oncologists could identify ASCT eligibility criteria.
- Community oncologists, who treat a range of cancer conditions, highly valued the Center's MM expertise in assessing transplant eligibility and care delivery.
- When consultation occurred, community oncology care teams perceived good alignment between sites and the Center, with few disagreements on eligibility and first-line treatment; this was driven by strong physician-to-physician communication, use of weekly tumor boards, care coordination using specialized nurse navigators, and rapid response by the Center.

## Referral and Consultation Barriers

- Some community oncologists preferred to exclude from referral any patients they felt were clearly transplant-ineligible due to age, fitness level, and/or comorbidities.
- For some referred patients, Center consultation was not covered by their insurance, and they sought care elsewhere.
- Patient treatment preferences and socioeconomic concerns, including distance to the Center, were identified as reasons for patients not attending consultation at the Center.

TABLE 1: Patient Demographics – Transplant Eligible

Transplant-Eligible Patients					
Characteristic	Not Referred	%	Referred	%	p value
Count, N	25		164		
Sex, male	12	48%	105	64%	0.12
Age at treatment, mean (years)	72.3		62.2		<0.001
Ethnicity, Hispanic	1	4%	22	13%	0.18
Race					0.48
White	21	84%	138	84%	
Non-White	0	0%	6	4%	
Unavailable/Patient declined	4	16%	20	12%	
Charlson Comorbidity Index score, mean	2.9		2.2		0.21
Distance to Center, mean (miles)	171.9		145.5		0.36
≥100 miles	16	64%	72	44%	0.03
Died, as of June 30, 2025	8	32%	15	9%	0.001
Referral activity					
Referred to Intermountain	na		156	95%	
Pre-implementation referral rate			84%		
Post-implementation referral rate			91%		
Received expert Center consult	na		154	94%	
Transplant activity					
Probable transplant eligible, not intended	23	92%	37	23%	<.001
Stem cells collected, transplant pending	0	0%	10	6%	na
Stem cell transplant complete or planned	0	0%	120	73%	na

TABLE 2: Patient Demographics – Transplant-Ineligible

Transplant-Ineligible Patients					
Characteristic	Not Referred	%	Referred	%	p value
Count, N	50		30		
Sex, male	27	54%	21	70%	0.16
Age at treatment, mean (years)	82.3		70.6		<0.001
Ethnicity, Hispanic	2	4%	3	10%	0.28
Race					0.37
White	41	82%	24	80%	
Non-White	4	8%	2	7%	
Unavailable/Patient declined	5	10%	4	13%	
Charlson Comorbidity Index score, mean	4.7		5.3		0.50
Distance to Center, (miles)	196.0		121.5		0.06
≥100 miles	29	58%	12	40%	0.06
Died, as of June 30, 2025	22	44%	9	30%	0.21
Referral activity					
Referred to Intermountain			30	100%	
Pre-implementation referral rate			31%		
Post-implementation referral rate			46%		
Received expert Center consult			27	94%	

FIGURE 1: Adjusted Overall Survival in Transplant-Eligible Patients According to Myeloma Expert Transplant Evaluation

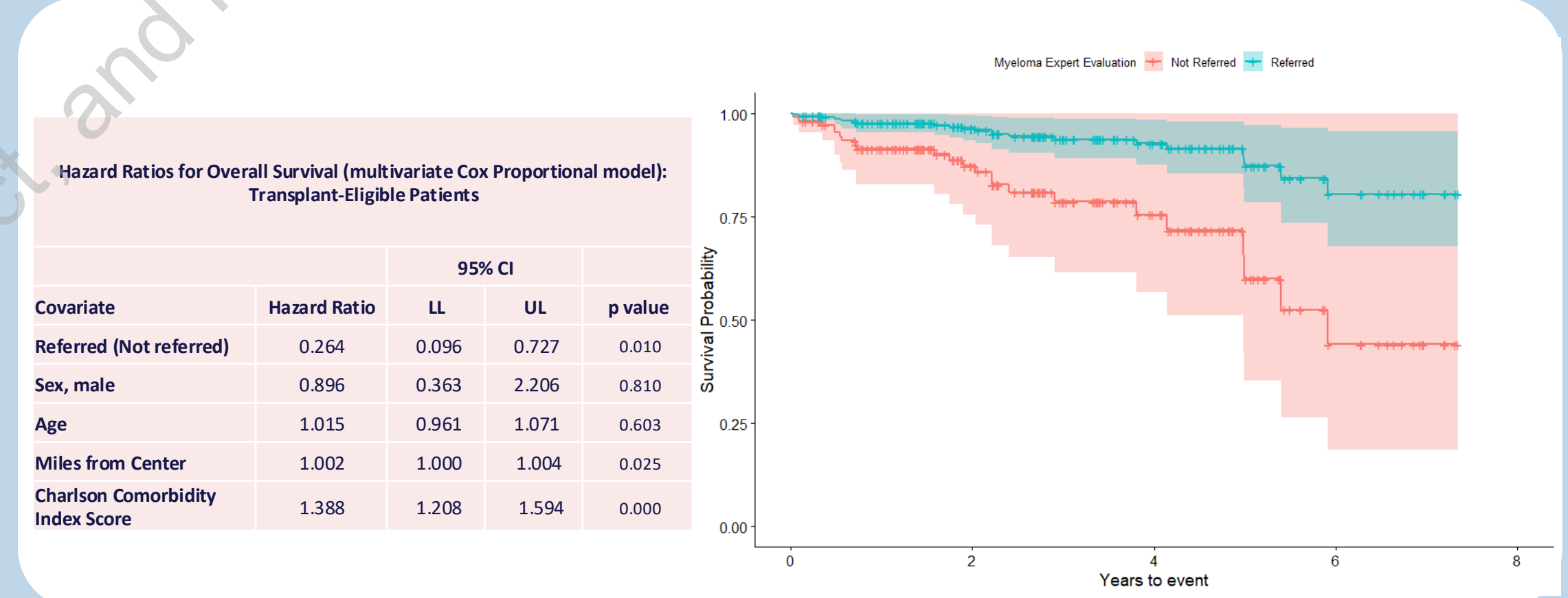
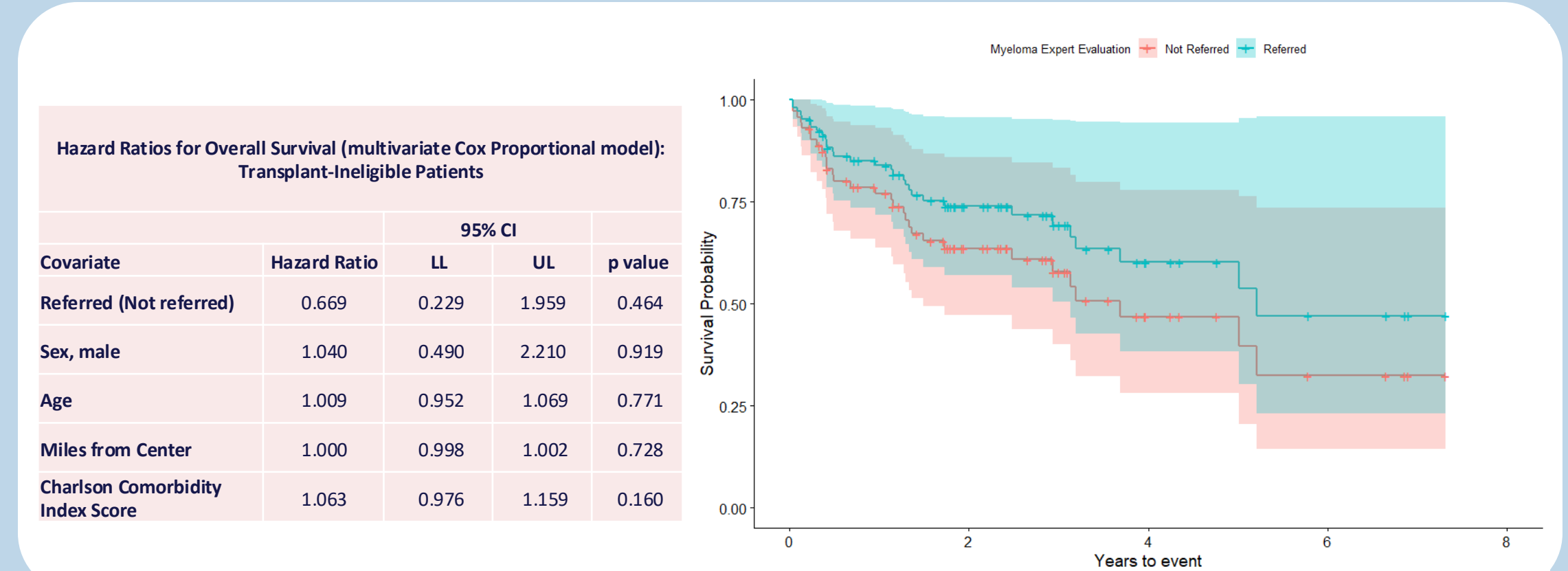


FIGURE 2: Adjusted Overall Survival in Transplant-Ineligible Patients Based on Referral for Expert Consultation



## Conclusions

A systematized approach to advanced MM care using an MM center of excellence and early referral is viable to implement, palatable to community oncologists, and beneficial to patients. The establishment of a formal MM evaluation program was associated with increases in referral rates and, consequently, more complete informed consent regarding ASCT. Despite developing novel therapies, ASCT remains the reported standard of care among surveyed community oncologists. Community oncology teams interviewed felt that ASCT care was best carried out centrally, although some evaluated transplant eligibility themselves, and persistent patient barriers remain. Referral for MM expert consultation and transplant discussion was associated with improvements in overall survival among transplant-eligible patients. In this large healthcare network, a higher proportion of patients underwent ASCT compared to historical norms.