**IMS Abstract**

# Physiological and Quality-of-Life Trajectories During Autologous Transplantation: Findings from the MY-TRAC Study


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**Background**
Passive wearable sensors offer a scalable method for capturing real-time physiology during myeloma treatment, but evidence for feasibility and acceptability in autologous stem cell transplantation (ASCT) is limited. MY-TRAC prospectively evaluated wearable-derived physiological and patient-reported outcomes across ambulatory and inpatient ASCT pathways.

**Methods**
Adults undergoing ASCT were provided with a wrist-worn wearable (Fitbit Charge 6) from Day −10 to +28. The primary endpoint was feasibility, defined as ≥70% waking-hour wear-time. Step count, heart rate (HR), and sleep duration were summarised across four windows: Pre-ASCT, Day0-5, Day+6-14, and Day+15-28. Patient-reported outcomes were assessed using the EORTC QLQ-C30 and myeloma-specific QLQ-MY20 at baseline and Day+28. PROM change was interpreted using a ≥5-point group-level MID threshold with exploratory paired testing and a ≥10-point individual-level responder threshold. Quantitative data were analysed descriptively.

**Results**
Thirty-two participants activated wearable monitoring (ambulatory n=10; inpatient n=22). Median age 61 years (43-71), 69% male. The study met its primary endpoint, 24 (75%) participants achieved ≥70% wear-time. Four-window datasets were available for 29/32 participants (91%) for step count, 28/32 (88%) for HR, and 23/32 (72%) for sleep duration.

Median step count declined from 6,483 steps/day pre-ASCT to 2,205 Days0-5, reached nadir during Days+6-14 (1,299), and partially recovered by Days+15-28 (2,096). Median HR increased from 67 bpm pre-ASCT to 80 bpm during Days+6-14 and remained elevated during Days+15-28 (81 bpm). Median sleep duration increased from 380 min/night pre-ASCT to 487 during Days0-5 and remained elevated through Days+15-28. Sleep duration was similar between care settings at baseline, with ambulatory participants recording longer sleep during Days0-5 (533 vs 424 min/night), but broadly comparable sleep duration during later recovery.

PROM completion was 97% (31/32), with analyses conducted in 31 paired observations. At group level, improvements meeting both MID and exploratory statistical criteria were observed in MY20 disease symptoms (−12.07; p=0.000364) and insomnia (−17.86; p=0.033), while deterioration meeting both criteria was observed for appetite loss (+15.48; p=0.013) and body image (−16.67; p=0.0014). Individual-level responder analysis using a ≥10-point threshold showed substantial heterogeneity, with body image deteriorating in 21/31 participants (68%), pain improving in 19/31 (61%) and MY20 disease symptoms improving in 15/31 (48%).

**Conclusions**

Continuous wearable monitoring during ASCT generated objective physiological trajectories with marked activity suppression, sustained HR elevation, relatively preserved sleep duration, and partial recovery by Day+28. Integration with PROMs offers a novel approach to characterising multidimensional recovery and may inform digitally enabled supportive-care strategies in multiple myeloma.