Compliance with Weight-Bearing Precautions: A Prospective Observational Study

***Michael Murphy**; Andres Redondo; William J. Davis; Dimitri Joseph Mabarak; Hobie D. Summers, MD; Joseph Bowman Cohen, MD; William Dean Lack, MD*
Loyola University Medical Center, Maywood, IL, United States

Purpose: Patients are instructed on weight-bearing restrictions after orthopaedic trauma based on historical norms, clinical intuition, and biomechanical research, but there is limited understanding of how compliance varies by restrictions.

Methods: We prospectively identified 45 lower-extremity trauma patients (27 male, 18 female) instructed on non-weight-bearing (NWB, n = 30), touchdown weight-bearing (TDWB, n = 11), and as tolerated (WBAT, n = 4). Compliance was determined with Strydalyzer INSIGHT insole pressure sensors as inpatients (n = 45) and at 2-week (n = 34) visits. Patients completed questionnaires in addition to assessment of age, gender, weight, educational level, fracture pattern, step count (home pedometers), Timed Up and Go, pain, Charlson Comorbidity Index (CCI), ASA (American Society of Anesthesiologists) score, drug use, distance ambulated, disposition, therapy visits, caloric intake, handedness, concurrent injuries, and grip strength (dynamometer).

Results: Mean age was 47.7 years (range, 21-84). Inpatient noncompliance was associated with preinjury exhaustion ($P < 0.02$). Noncompliance at 2 weeks was associated with TDWB ($P < 0.01$), difficulty ascending 12 stair flights prior to injury ($P = 0.02$), disorientation ($P < 0.01$), poor recall ($P < 0.05$), and a lesser distance ambulated as inpatient ($P < 0.01$). Median (maximum) weight borne as an inpatient was 100 (163), 29 (191), and 0 (99) lbs for the WBAT, TDWB, and NWB groups, respectively. This progressed to 137 (191), 29 (154), and 0 (12) lbs at the 2-week follow-up for the WBAT, TDWB, and NWB groups, respectively. Within the TDWB group, the median weight (range) borne by those exceeding instructions was 177 (117-191) and 117 (84-154) lbs as inpatients and 2 weeks, respectively.

Conclusion: Inpatient compliance was similar for different restrictions; however, TDWB instructions were associated with postdischarge noncompliance. This was most likely to occur in the setting of frailty and mental limitations. We recommend such patients be best treated with dichotomization to either NWB or WBAT.