Physical activity in general, and walking ability (distance, speed, quality) in particular, play a major role as potential patient-oriented clinical outcome measures in many diseases in particular musculoskeletal disorders and are also likely to become highly relevant for health authorities (HA) and payers. Musculoskeletal drugs rely heavily on such robust mobility endpoints for success. Today, HA approved clinical endpoints for physical activity and function are limited to patient reported outcomes (PROs, questionnaires) and variable rapid “snapshot” tests in the clinics (6 minute walk, gait speed). To address this, and in collaboration with our external partners, we have integrated an accelerometry device in 2 of our currently running clinical studies across 132 sites and currently 206 patients are equipped. Sample acceleration in 3 planes is being collected at 100Hz, 24/7 and some patients have now been wearing the device for over a year. We are exploring, developing and benchmarking algorithms to estimate the walking speed of patients in their real-life environment as well as different aspects of the patients gait. In order to explore injury recovery, we have collected longitudinal data on a patient who underwent knee surgery and who has worn the belt for several months and we present results on the improvement of his gait over time after the surgery.