

REHABILITATION AND BIOMECHANICS (DO THE LOCOMOTION)

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Rehabilitation is defined by the Institute of Medicine as the restoration of “some or all of the patient's physical, sensory, and mental capabilities that were lost due to injury, illness, or disease.” Rehabilitation includes assisting the patient to compensate for deficits that cannot be reversed medically. It is prescribed after many types of injury, illness, or disease, including [amputations](#), arthritis, [cancer](#), cardiac disease, neurological problems, orthopedic injuries, spinal cord injuries, [stroke](#), and traumatic brain injuries. It has been estimated that as many as 14% of all Americans may be disabled in some way at any given time, and that nearly 1.5 million Americans have a disability that requires use of a manual wheelchair [1].

The achievement of functional independence for individuals with disability is a primary goal in rehabilitation. Because independent locomotion is essential to independent function, rehabilitation interventions are usually directed toward this goal for those individuals who desire independent function and for whom that goal is feasible.

Studies in rehabilitation science research have incorporated combinations of variables that are not likely to be studied in separate existing basic science, health professional or engineering disciplines. Models of disability have provided a framework for examining how rehabilitation research studies address the enabling-disabling continuum [2]. Within this framework, biomechanical measures and analyses play an

important role in quantifying disability related performance and factors affecting the enabling-disabling process.

This is illustrated, for example, by selected studies of walking gait and wheelchair propulsion. I will discuss how biomechanical performance measures have contributed to an understanding of disability and how rehabilitation interventions can be more individualized and effective.

CONCLUSIONS

Future work that incorporates biomechanical performance measures in the framework of “enablement” would ensure that all of those who desire to do so would be able to independently “do the locomotion” [3].

REFERENCES

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2. Enabling America: Assessing the Role of Rehabilitation Science and Engineering (Brandt & Pope, Eds., National Academy Press, 1997)
3. Little Eva circa 1962

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