In recent years, the majority of the population has become increasingly reliant on continuous and independent control of smart devices to conduct activities of daily living. Upper extremity movement is typically required to generate the motor outputs that control these interfaces, such as rapidly and accurately navigating and clicking a mouse, or activating a touch screen. For people living with tetraplegia, these abilities are lost, significantly compromising their ability to interact with their environment. Implantable brain computer interfaces (BCIs) hold promise for restoring lost neurologic function, including motor neuroprostheses (MNPs). An implantable MNP can directly infer motor intent by detecting brain signals and transmitting the motor signal out of the brain to generate a motor output and subsequently control computer actions. This physiological function is typically performed by the motor neurons in the human body. To evaluate the use of these implanted technologies, there is a need for an objective measurement of the effectiveness of MNPs in restoring motor outputs. Sawyer et al. propose the concept of digital motor outputs (DMOs) to address this: a motor output decoded directly from a neural recording during an attempted limb or orofacial movement is transformed into a command that controls an electronic device. Digital motor outputs are diverse and can be categorized as discrete or continuous representations of motor control, and the clinical utility of the control of a single, discrete DMO has been reported in multiple studies. This sets the stage for the DMO to emerge as a quantitative measure of MNP performance [1].

1)
Sawyer A, Cooke L, Ramsey NF, Putrino D. The digital motor output: a conceptual framework for a meaningful clinical performance metric for a motor neuroprosthesis. J Neurointerv Surg. 2023 Jul 31:jnis-2023-020316. doi: 10.1136/jnis-2023-020316. Epub ahead of print. PMID: 37524520.