

decreased. The potential side effects or harms tend to be related to discomfort from the harnesses and skin integrity issues.

The Work Group systematically reviewed evidence related to this recommendation.(115-118) Therefore, it is categorized as *Reviewed, New-added*. The Work Group's confidence in the quality of the evidence was very low. The body of evidence for upper extremity motor outcomes had some limitations, including lack of blinding of outcome assessors, possible attrition bias, and possible selective reporting.(116) Unclear blinding or unblinded interventions and unclear allocation concealment were noted in several studies of upper extremity motor outcomes.(115) The body of evidence for lower extremity motor outcomes had some limitations, including unclear allocation methods; unclear blinding or unblinded participants, staff, assessors, or any combination of the aforementioned individuals; and incomplete data.(118) Studies of lower extremity motor outcomes frequently did not indicate whether participants, staff, assessors, or any combination of the aforementioned individuals were blinded and whether concerns for selective reporting and unclear or improper randomization and allocation concealment techniques developed.(117) Patient values and preferences varied because some patients might find RAT especially exciting and innovative, although others might prefer to avoid this technology. If the availability of RAT increases to potentially include home use, patients might be more likely to continue engaging in rehabilitation and have sustained positive effects. The benefits of RAT for short-term improvements in upper limb movements as measured by the FMA only slightly outweighed the potential harms, which were minimal and related to discomfort from the harnesses and skin integrity issues. Based on the data suggesting equal efficacy of conventional therapy, the Work Group can recommend neither for nor against the use of RAT for improvement of lower extremity motor outcomes. Thus, the Work Group made the following recommendation: There is insufficient evidence to recommend for or against robot-assisted therapy to improve upper or lower extremity motor outcomes

Recommendation

19. There is insufficient evidence to recommend for or against virtual reality to improve balance or enhance gait recovery.

(Neither for nor against | Reviewed, New-replaced)

Discussion

Virtual reality computer-based systems allow the user to interact within a virtual multisensory environment in real time. A wide array of systems is available, from simple commercial units used primarily for home gaming or fitness to more elaborate systems designed specifically for rehabilitation. Virtual reality/gaming systems used for stroke rehabilitation, otherwise known as serious games, have an education or specific rehabilitation goal (e.g., increased involved extremity use) instead of an entertainment purpose. These systems can be non-immersive where a person interacts with a