2016; Touillet et al., submitted). We showed, among others, that one persistent characteristic of PLM is the associated fatigue, which potentially is a problem when using PLM for prosthesis control since fatigue diminish the mobilization capacity as well as the stability of the EMG signals and thus interferes with the prosthesis control.
Material and method In the present study, we explored whether PLM training (not to confound with learning) can increase mobilization capacity and stabilize EMG signals. Five trans-humeral amputees volunteered for training of all their types of PLM at home on a daily basis during about 6 weeks. Kinematics (via the intact limb imitating the phantom movements) as well as EMG signals from the residual muscles were recorded just before and right after the training period.
Results None of the participants experienced (phantom or residual limb) pain related to the training. Three participants increased the number of different PLM they could execute. All of them increased the amplitude and velocity, and thus diminished the cycle duration, as well as the number of cycles they could execute before the PLM blocked by fatigue. The amplitude of the EMG increased and became more specific to the type of PLM.
Conclusion In conclusion, as is the case for intact limbs, training of PLM improves motor performance and stabilizes the EMG signals associated to PLM execution. This is encouraging for future PLM-based prosthesis control.
Keywords Phantom mobility; Training; Muscle activity
Disclosure of interest The authors declare that they have no competing interest.

https://doi.org/10.1016/j.rehab.2018.05.867

ISPR8-1174

Barriers and facilitators for the implementation of clinical practice guidelines for the amputee: The perception of users

Posada*, D. Patiño , M.D.P. Pastor , L.H. Lugo , V. Ciro , J. Plata , D. Aguirre
Facultad de Medicina, Universidad de Antioquia, Medellin, Colombia
* *Corresponding author.*
E-mail address: amposada@gmail.com (Posada)

Introduction/Background Efforts to produce high quality clinical practice guidelines (CPG) must be accompanied by implementation strategies aimed at eliminating specific barriers. With this study, we seek to identify the perceptions of the users of the CPG for the rehabilitation and care of individuals with lower limb amputation on the factors that facilitate or hinder its implementation.
Material and method A qualitative design was used. Semi-structured interviews were conducted with patients, health service providers and administrators of medium and high complexity organizations of the health system in Colombia. The transcribed interviews were coded to identify emerging categories based on the empirical findings. These were compared and complemented with the theoretical categories that resulted from the review of the literature.
Results In the analysis of the 38 interviews the perceived barriers were: Categories related to the patient, such as clinical and sociodemographic aspects (e.g., low economic resources, comorbidities and reduced mobility); access to services (e.g., residence in rural areas) and the type of social security affiliation. Categories related to the professionals, such as knowledge and competences (e.g., variability in academic training programs), experience with the amputated patient and communication skills. Categories related to the health system, such as availability of resources, opportunity in the care, information systems, costs of the health services and changes in the regulations of the system. And categories related to the CPG, such as its usefulness, methodological rigor, flexibility and the characteristics of the developer group.
Conclusion We identified categories not included in the theoretical review, such as the type of affiliation to social security, the variability in academic training programs, the changes in the system's regulations and the usefulness of the CPG. These findings allow designing implementation strategies that respond better to the Colombian scenario.
Keywords Qualitative research; Clinical practice guidelines; Implementation
Disclosure of interest The authors declare that they have no competing interest.

https://doi.org/10.1016/j.rehab.2018.05.868

ISPR8-1940

The importance of somatosensory feedback for phantom limb mobility revealed by differences in phantom movement kinematics between above- and below-elbow amputees

Touillet [1], N. Jarrassé [2], N. Martinet [1], C. Nicol [3], J. Paysant [1], J.B. De Graaf [3,*]
[1] *Institut Régional de Réadaptation UGECAMNE, Centre Louis-Pierquin, Nancy, France*
[2] *Institut des Systèmes Intelligents et de Robotique, Sorbonne Université, Paris, France*
[3] *Institut des sciences du mouvement UMR 7287, Aix-Marseille Université, Marseille, France*
* *Corresponding author.*
E-mail address: amelie.touillet@ugecam-ne.cnamts.fr (Touillet), jozina.de-graaf@univ-amu.fr (J.B. De Graaf)

Introduction/Background After amputation, hand and wrist phantom limb movements (PLM) are experienced as effortfull, slower and smaller than healthy limb movements. Our hypothesis is that this is caused by the altered somatosensory feedback coming from the residual limb muscle contractions that are associated to PLM. If this is true, one can expect to find differences between below- and above-elbow amputees since the latter ones still have many muscles left that were involved in hand and wrist movements, such that the sensory feedback is close to that before the amputation. To test this hypothesis, we compared PLM kinematics between above- and below-elbow amputees.
Material and method Six above- and 8 below-elbow amputees performed phantom hand and wrist PLM. The kinematics of the PLM was indirectly obtained via the intact limb that synchronously mimicked the PLM at a comfortable velocity, using a Cyberglove for hand movements and an inertial measurement unit for wrist movements. For each patient and each type of PLM, we determined the number of executed cycles, the duration of the cycles and the velocity.
Results Our results show that after above-elbow amputation the number of different types of PLM was higher, PLM repetitions were more numerous before blocking caused by fatigue, cycle duration was shorter and velocity was higher.
Conclusion In conclusion, below-elbow amputees have more facilities for PLM execution (i.e., they perceive their PLM as faster and less tiring) than above-elbow amputees. This confirms our hypothesis that the more the somatosensory feedback is altered with respect to intact limb feedback, the slower and more effortfull are PLM.
Keywords Kinematics; Phantom mobility; Neuromuscular plasticity
Disclosure of interest The authors declare that they have no competing interest.

https://doi.org/10.1016/j.rehab.2018.05.869