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Appraisal

Clinimetrics: The Physical Function in ICU test-scored

Summary

Description: The Physical Function in ICU (intensive care unit) test (PFIT) is a composite measure of muscle strength and physical function that was developed by Australian physiotherapists from a sample of medical-surgical ICU and respiratory weaning unit patients.[1] In 2013, the measure was refined to improve clinimetric properties by item reduction to four tasks (sit-to-stand, marching on the spot cadence, shoulder flexion and knee extension strength) and testing of a matrix for converting ordinal to interval scores, resulting in the present PFIT-scored (PFIT-s) version.[2] The PFIT-s is accessible, takes approximately 10 to 15 minutes to administer,[3] requires minimal equipment (a chair and stopwatch), is available in English and Brazilian Portuguese,[4] and is extensively validated.[5–15]

Methodology and scoring: Each PFIT-s item is scored from 0 to 3 and summed to a maximum ordinal score of 12, with higher scores representing better physical function.[2] Level of assistance for the patient to safely transfer from sit-to-stand is first rated as unable, assistance of two people, assistance of one person or no assistance from therapist (scored 0 to 3, respectively).[2] If standing is achieved, stepping cadence (steps/minute) is assessed by marching in place. Assessment conventions for step cadence have included stopping the timer if a patient ceases to step for $>$ 2 seconds or has poor foot clearance,[8] and awarding the maximum item score of 3 (equivalent to $\geq$ 80 steps/minute) if a patient can step for $\geq$ 3 minutes.[13] Shoulder flexion and knee extension strength scores are derived from grading with the Oxford scale, ideally tested in sitting with the higher grade across left and right used. If a patient is unable to be positioned in sitting, strength testing can occur in recumbent positions such that patients with lower functioning can still be assessed with the PFIT-s. Finally, interval conversion scores (range 0 to 10) are determined[2] and interpreted with a minimum detectable difference of 2.42 points[5] and minimum clinically important difference of 1.5 points.[2]

Clinimetric properties: Clinimetric testing has occurred in several independent and international samples where the PFIT-s has been found to have good inter-rater reliability[5] and be responsive to change over time.[2,3,5,6] At awakening and ICU discharge there is moderate-excellent validity between the PFIT-s and other physical measures (namely the Functional Status Score in the ICU, ICU Mobility Scale and the Short Physical Performance Battery),[2,3,5,6] and excellent construct validity with muscle strength at these same time points.[6,7] Higher PFIT-s scores have predictive validity for discharge to home, post-ICU hospital length of stay and higher health-related quality of life after hospital discharge.[2,3,6] Within the ICU, the PFIT-s has minimal floor and ceiling effects ($\leq$ 1 to 12%)[6–8] but ceiling effects are significant by hospital discharge ($\sim$25 to 27%).[5,6]

Commentary

The PFIT-s appears to be most useful earlier in an ICU survivor's recovery, as there are ceiling effects and an absence of items that test higher levels of physical functioning. To address ceiling effects of the PFIT-s and floor effects of other measures, the new 'PACIFIC' tool was recently developed, amalgamating the PFIT-s and De Morton Mobility Index through Rasch analyses to build a 10-item interval measure with improved task coverage and potential for use across acute and community settings.[8] Recently, the PFIT-s has also been used to test the validity of a new patient-rated (rather than therapist-rated) scale of physical function in the ICU and acute care setting.[9]

The decision of when to choose the PFIT-s over other robust ICU physical measures such as the ICU Mobility Scale[10] will depend on what domains of impairment and activity limitation the therapist is aiming to evaluate. For example, the PFIT-s evaluates strength, mobility and endurance,[3] whereas the ICU Mobility Scale focuses on mobility subdomains based on the International Classification of Functioning.[10] The key benefits of the PFIT-s are: minimum equipment and training requirements (including resource-limited settings);[11] tasks that can be easily and regularly incorporated into physiotherapy assessment (at a minimum recommended at awakening and ICU discharge);[3] utility for monitoring change in physical recovery over time and in response to rehabilitation interventions (as demonstrated in observational and randomised trials);[12–14] and utility to support exercise prescription within the ICU, which is a unique feature of the PFIT-s.[15]

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Selina M Parry[a] **and Claire E Baldwin**[b]

[a]*Department of Physiotherapy, The University of Melbourne, Melbourne*
[b]*Caring Futures Institute and College of Nursing and Health Sciences, Flinders University, Adelaide, Australia*

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