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The Matching Assessment using Photographs with Scars (MAPS) **App: Reliability testing**

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Figure: Reliability testing process and results tables. **Background: Primary Investigator:** Rater 1: **Health Statistician:** Identified 3-10 scars on Experienced at scar assessment, Pre-determined power calculation Physiotherapist (n=42 scars, 3 assessors) Rater 2: **Rating Process:** → for accurate relocation at re-test portable digital tablet Observed and recorded descores for each rater Re-assessment of same Raters blinded to each scar sites 3-7 days other's assessment & scores following initial assessment **Health Statistician:** Analysis of assessment data: Thickness - Inter-rater reliability; Fleiss' Kappa calculated Intra-rater reliability; Cohen's Kappa calculated

Intra-rater reliability - comparison of Initial vs. repeat assessments

Variable	Cohen's Kappa	Interpretation	ICC (95% CI)	Interpretation	
Surface	0.56*	Moderate agreement	0.76 (0.55, 0.87)	Excellent reliability	
Height	0.43*	Moderate agreement	0.76 (0.55, 0.87)	Excellent reliability	
Thickness	0.57*	Moderate agreement	0.82 (0.67, 0.91)	Excellent reliability	
Colour	0.90*	Almost Perfect agreement	0.98 (0.97, 0.99)	Excellent reliability	
0000				* p < 0.0001	

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The MAPS scar assessment tool, published in 2005, was recommended as one of the preferred scar assessment tools by a recent systematic review, as it enables accurate relocation and reassessment of the scar. With electronic records & increasing use of smart devices in health, the MAPS manual was translated into an App format. At the time of development no other scar assessment Apps were available, making this the first of its kind

To ensure the MAPS App version maintained the inter- & intra-rater reliability of the original MAPS manual, testing was conducted (see Fig 1.).

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Variable	Combined Fleiss' Kappa	Interpretation	ICC (95% CI)	Interpretation
Surface	0.40*	Fair agreement	0.76 (0.61, 0.86)	Excellent reliability
Height	0.38*	Fair agreement	0.87 (0.78, 0.92)	Excellent reliability
Thickness	0.49*	Moderate agreement	0.89 (0.82, 0.94)	Excellent reliability
Colour	0.40*	Fair agreement	0.91 (0.86, 0.95)	Excellent reliability

Intra-rater reliability – Cohens's Kappa comparison of initial vs repeat assessments for Rater 1 (experienced rater)					
Surface	0.81*	Almost perfect agreement			
Height	0.62*	Substantial agreement			
Thickness	0.74*	Substantial agreement			
Colour	0.70*	Substantial agreement			



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Feedback

Results:

Eight participants (7 male:1 female), aged 47-80 years, representing a total of 44 scars, were included for the purpose of determining reliability of scar ratings using the MAPS module within the App.

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Inter-rater reliability, Fleiss Kappa comparison of Rater 1 vs 2 vs 3 demonstrated Fair to Moderate Agreement across the 4 domains of Surface ($P = \le 0.002$), Height (P =≤0.0001), Thickness (P=<0.0001), & Colour (P=<0.0001). ICC results demonstrated excellent reliabi; ity across all domains.

Combined Cohen's Kappa intra-rater reliability comparisons of all raters of initial vs repeat assessments demonstrated Moderate to Almost Perfect Agreement across the 4 measured domains (P=<0.0001). Intra-rater reliability for Rater 1 demonstrated Substantial to Almost Perfect Agreement across all 4 measured domains (P=<0.0001). ICC results demonstrated excellent reliabi; ity across all domains.

Discussion:

The MAPS App contains scar assessment tools that can reliably be applied to clinical practice and research. It's report output can be easily integrated into electronic records or printed for paper records due to its functionality. As it can be completed on a mobile device it is easily accessible for clinicians and researchers, and takes less time to complete than the original paper version Clinicians who have experience examining scars have

demonstrated excellent intra-rater reliability.

Conclusions:

The MAPS module of the App has demonstrated intraand inter-rater reliability as a scar assessment tool given its change in format from a paper based manual to digital App with upgraded reference photographs.

Reference:

Masters M, et al. Reliability testing of a new scar assessment tool, Matching Assessment of Scars and Photographs (MAPS). JBCR. 2005;26(3):273-84.





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