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THE 'BRACE-CHECK LIST': A NEW TOOL FOR SCOLIOSIS BRACE QUALITY CONTROL

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Background

Brace fitting is a crucial step in the conservative treatment of idiopathic scoliosis (stage of brace check - BC). During BC, the synergy between the doctor (MD) and the orthopaedic technician (CPO) is vital to ensuring the patient receives a brace that performs its corrective function as effectively as possible while not causing excessive discomfort. To the best of our knowledge, there is no literature on how to optimally perform BC in everyday clinics.

Study Design

We conducted a Delphi consensus process among MDs and CPOs specialized in spinal disorders rehabilitation and push-up braces.

Objective (s)

Identify critical issues detected during braces evaluation requiring changes to the brace, develop and validate two checklists, one for BC (Brace-Check list - BCL1) and one for subsequent clinical consultations (BCL2).

Methods

We divided MDs treating idiopathic scoliosis into two groups: 1) only providing consultations to patients with idiopathic scoliosis wearing braces at least twice a week (G1), and 2) also performing BC with CPOs at least once a month (G2). To develop BCL1 and BCL2 we used answers of G2 and both groups, respectively. For the final Consensus Meeting we involved CPOs from 9 different companies and locations working with our Institute physicians during BC since minimum 3 years. MDs answered open-ended questions about brace issues for BCL1 and BCL2; responses were consolidated into item lists. Items required ≥80% agreement and were revised based on feedback. A 4-hour consensus meeting with MDs and CPOs approved the checklists and defined corrective measures for each item.

Results

The initial round involved 21 medical experts:10 in G1 and 11 in G2 (response rate 95%).The second round was limited to G2 (response rate 100%). In the first round, the most common problems suggested by participants were: lateral overhang (89%), poor correction (78%), and high brace (67%). Items were organized into four functional domains: brace fit, brace tolerability, brace overall balance across the three spatial planes, and brace effectiveness. During the second round, an agreement above 80% was reached for most of the items(Table 1). Final BCL1 and BCL2 were unanimously approved by all participants to the Meeting:19 MDs (90%) and 17 CPOs (100%). Each item was also provided with unanimously agreed corrective measures.

Table 1

BRACE-CHECK LIST 1 (FOR BRACE CHECKS)	BRACE-CHECK LIST 2 (FOR CONSULTATIONS)
Brace fit	**Brace fit**
Wide brace	Wide brace
Small brace	Small brace
High brace	Low brace
Low brace	Brace that compresses the breast
Long brace	Structural alterations
Lateral compression brace	
Anterior-posterior tight brace	
Brace that compresses the breast	
Brace that proximally detaches from the trunk	
Incorrect front closure	
Plastic too tight	
Incorrect cutting lines	
Brace tolerability	**Brace tolerability**
Feeling of abdominal tightness	Skin lesions on the back
Breathing difficulties	Skin lesions on the pelvis
Pain when pushing	Axillary skin lesions
Pain in the pelvis	Skin lesions everywhere
Axillary pain	Pain when pushing
Paresthesia in the upper limbs	Pain in the pelvis
Pain everywhere	Axillary pain
Anxiety of parents or patients	Pain everywhere
Brace rejection	Brace rejection
Inappropriate expectations	Brace closed incorrectly
	Difficulty using the brace
Brace overall balance across the three spatial planes	**Brace overall balance across the three spatial planes**
Lateral overhang	Lateral overhang
Front overhang	Front overhang
Rotating overhang	Rotating overhang
Proximal slope	Proximal slope
Brace effectiveness	**Brace effectiveness**
Poor correction	Poor correction
Incorrect thrust orientation	
Unnecessary pressure	

Conclusion(s)

The BC stage is an important determinant of treatment success and patient compliance.This study provides the first structured consensus-based framework to standardize the process.

Clinical significance

The BC should ideally be carried out by the MD together with the CPO. The identification of the main critical issues detected during testing has enabled the preparation of two “Brace-check list”: BCL1 for BC, and BCL2 for consultations. Their use could allow to quickly check all points that could potentially be critical without overlooking any aspect.