PD ISO/TR 16840-9:2015

BSI Standards Publication

Wheelchair seating

Part 9: Clinical interface pressure mapping guidelines for seating

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National foreword

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Sieges de fauteuils roulants —

Partie 9: Lignes directrices pour l'utilisation d'un système de mappage de pression

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Contents

Page

Foreword ..... **v**
Introduction ..... **vi**
1 Scope **1**
2 Definitions and glossary **1**
2.1 Calibration 1
2.2 Coefficient of Variation (CoV) 1
2.3 Conformity 1
2.4 Contact area 2
2.5 Creep 2
2.6 Dispersion Index (DI) 2
2.7 Envelopment 2
2.8 Fomite 2
2.9 Hysteresis error 2
2.10 Immersion 3
2.11 Pressure, stresses, and forces 3
2.11.1 Axial strain (ε) 4
2.11.2 Perpendicular force (FP) 4
2.11.3 Pressure (p) 4
2.11.4 Shear force (FS) 5
2.11.5 Shear stress (τ) 5
2.11.6 Shear strain (γ) 5
2.11.7 Friction force 5
2.12 Sensor saturation 6
3 Applications **6**
3.1 Cushion comparison 6
3.2 Wheelchair set-up 6
3.3 Client/caregiver education 7
3.4 Dynamic activity 7
3.5 Relevance to activities of daily living 7
4 Test protocol in a clinic **7**
4.1 Infection control 8
4.1.1 Wash hands 8
4.1.2 Avoid cross-infection 8
4.1.3 Protect the mat 8
4.2 Setting up 8
4.2.1 Set up mat 8
4.2.2 Prepare test protocol 8
4.2.3 Prepare client file 8
4.2.4 Be consistent 9
4.2.5 Check mat orientation 9
4.2.6 Check mat position 9
4.2.7 Smooth mat into cushion 9
4.2.8 Acclimatize test cushions 9
4.3 Transferring the client and getting the client into position 9
4.3.1 Transfer boards 9
4.3.2 Remove unnecessary items 9
4.3.3 Post-transfer checks 10
4.3.4 Consistency between tests 10
4.3.5 Settling time 10
4.4 Introducing pressure mapping to the client 10
4.4.1 Position of the screen 10
4.5 Capturing data 10
4.5.1 Identify position of bony prominences 10

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4.5.2 Record one or more images 11
4.5.3 Repeat the process 11
4.5.4 Check the images 11
4.5.5 Validate the images 11

5 Documentation 11
5.1 File naming protocol 12
5.2 File location 12
5.3 Make notes immediately 12
5.4 Reporting 12
5.5 Photo documentation 12
5.6 Data back-up 12

6 Interpretation 12
6.1 An unexpected image 13
6.2 An image that is not ideal 13
6.3 The image shows nothing abnormal 13
6.4 IPM views and metrics 13
6.4.1 Isobar (2-D)/contour view 13
6.4.2 3-D/surface view 14
6.4.3 Centre of pressure (CoP) 15
6.4.4 Gradient 15
6.4.5 Asymmetry 15
6.4.6 Interpolation 16
6.4.7 Smoothing 16

7 Limitations 16
7.1 Prediction of pressure injuries 16
7.2 Microclimate 17
7.3 Clothing 17
7.4 Repeatability and relative values 17
7.5 Influence of posture 17
7.6 Sampling frequency 17

Bibliography 18

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 173, *Assistive products for persons with disability*, Subcommittee SC 1, *Wheelchairs*.

ISO 16840 consists of the following parts, under the general title *Wheelchair seating*:

— *Part 1: Vocabulary, reference axis conventions and measures for body segments, posture and postural support surfaces*

— *Part 2: Determination of physical and mechanical characteristics of devices intended to manage tissue integrity — Seat cushions*

— *Part 3: Determination of static, impact and repetitive load strengths for postural support devices*

— *Part 4: Seating systems for use in motor vehicles*

— *Part 6: Simulated use and determination of the changes in properties of seat cushions*

— *Part 9: Clinical interface pressure mapping guidelines for seating* [Technical Report]

— *Part 10: Resistance to ignition of non-integrated seat and back support cushions — Requirements and test methods*

— *Part 11: Determination of perspiration dissipation characteristics of seat cushions intended to manage tissue integrity* [Technical Specification]

— *Part 12: Apparatus and method for cushion envelopment testing* [Technical Specification]

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Introduction

The purpose of this Technical Report is to provide information as to where interface pressure mapping (IPM) can fit into a clinical assessment of an individual and their seating system, to highlight what can be achieved, and bring awareness of the limitations.

The use of IPM in the clinic is increasingly used to support clinicians in the evaluation of individual seating systems for individual clients. To get the best value from IPM requires a knowledge of the basic concepts of the interface pressure distribution (see Clause 2), the ability to define and apply a correct protocol for the application of IPM (see Clause 4), the ability to prepare correct documentation of the IPM (see Clause 5), and the skill in interpreting the collected data (see Clause 6).

The aim of an IPM test session can be different in a clinical or rehabilitation environment. In some cases it can be a tool to compare the behaviour of different pressure care or postural cushions. It can also be used to support the clinician in finding the best match between cushion and client. Various applications looking at the broader picture are covered in Clause 3. Whichever the application, the main objective behind using an IPM needs to be clear from the beginning.

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Wheelchair seating —

Part 9:
Clinical interface pressure mapping guidelines for seating

1 Scope

This Technical Report has been produced to guide users in the performance of the tasks that are directly involved in the clinical use of interface pressure mapping (IPM) or are synergistic with its use in a comprehensive wheelchair seating evaluation.

This Technical Report does not cover other aspects of the clinical assessment process (e.g. taking a medical history), nor the prescription or treatment process which might arise from an assessment. These guidelines are not meant to be a substitute for clinical reasoning and judgement within the context of a complete assessment.

This Technical Report refers to the state of the art of IPM experience in a seating scenario. Most of the principles covered can be extrapolated to whole body (in bed) or to foot assessments, for example.

2 Definitions and glossary

2.1 Calibration

Calibration is a process wherein the sensing mat is subjected to known forces. The sensor responses are monitored and modelled in the software.

NOTE A record is kept of the responses (called a calibration file) and whenever the sensors output a similar response, the result is related to the previously known forces. In most cases, this is done by placing the mat in a purpose-built chamber with an air-filled bladder. The bladder is inflated and the pressure in the bladder is measured. It is assumed to be evenly pressurized over the mat.

Calibration allows for the software to accommodate changes with time (creep) or pressure (hysteresis) exhibited by the sensors.

Recalibrate the mat whenever the readings look unreliable, after excessive use, or at the manufacturer's recommended interval. Keep track of the uses of the mat and the date of the last calibration. Old calibration files should be retained (old calibration files can be loaded for comparison to determine change over a period).

2.2 Coefficient of Variation (CoV)

The CoV is expressed as a percentage:

$$Coefficient\ of\ Variation = \frac{Standard\ deviation}{Mean} \quad (1)$$

NOTE This is one of the statistical measures available to assess how evenly the pressure is distributed across a support surface. The lower the CoV, the lower the variability in the data set.

2.3 Conformity

The ability of the IPM mat to adapt to irregular shapes without creasing.

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