

Shear Seminar, 20 October 2014

Breakout Group Notes

Task group on Definition and terminology – Nicola Petrone

The group was composed by a variety of experts, ranging from Occupational Therapist, to Physiotherapist, Engineers, Manufacturers and Marketing experts.

When asked to report their feelings after the seminar presentations, the PT and OT answered that the main feeling resulting from the day was that “shear” is such a complex problem, having so many aspects and terms to be familiar with, that they will tend to avoid using it..

Secondly, the urgency for a joint work among engineers, scientists, PT and OT, Physicians emerged as fundamental way to let each other know and understand what are the needs of patients and care givers.

In particular, expectation of the professional that came to the seminar were regarding the correlation between the choice of wheelchair dimensions and functionality (tilting..) with shear and tissue integrity risks.

An approach to the problem that appeared to be successful was the development of a proper set of terms, based on scientific definitions, that could be simplified first into a set of technical terms and eventually be correlated with a set of clinically relevant terms and examples.

A wish that was expressed, that could be an important task to be addressed by researchers, was to develop a method/sensor that enables having a feedback/signal that reveals the incipient formation of pressure soars.

Shear Testing – Evan Call

Cumulative Force in the tissue is the ultimate concern.

What do we want to measure: Tissue Deformation

Test Method

1. **Gold Standard Tissue Cumulative Forces including Shear Strains**
Prefer to measure internal shear strain using MRI and FEA
Simply, how far did the tissue shift.
What resolution, High

IF we have thresholds for Muscle, skin fat and connective tissue.
Need more research on connective tissue and fat.
2. **USE MRI to design testing in the lab. Determine critical points and then develop appropriate tests**
3. **Use this method to drive the Surface shape / interaction**
Geometry and material properties development and selection or assess risk.

Research – Now and in the medium term – Lloyd Walker

1. Clearly MRI shows that what is happening inside the tissue is problematic e.g. location of tissue, changing properties of tissue types etc.
 - this suggests we need to progress the development of other imaging techniques for clinical use (e.g. ultrasound)
2. Currently the most reliable assessment tool for tissue integrity is the 'expert clinician's hand' but it is very experience dependent and hard to link with objective metrics
 - we need to understand what is being evaluated during such assessments, and then seek to find substitutes for some of this subjective assessment
 - any tools prepared need to be both relevant and meeting the KISS for everyday practitioners who don't go to CPD events focused on seating/pressure care.
 - There is a need to clarify several of these terms used
3. Human activity addresses tissue safety through movement and changes of position – regularly
 - What techniques do we have to measure and evaluate the impact of this on tissue integrity
 - Potentially utilise digital recorders and newer sensors to monitor over longer daily use to understand more of the way users are active vs. their tissue risk. We'll understand more of the user's daily life and experience.
 - Any assessment should be focussed on improving outcomes for the consumer – simplistic 'threshold' (32mmHg) or FEA analysis is very problematic – scope to verify the thresholds and then implement
 - Need to note that stability and mobility are often in conflict – for those with limited mobility (righting strength) we tend to use gravity to assist in enhancing stability, often with increased shear forces.
4. Evaluating surfaces now – important to develop a 'standard' cohort of test subjects (e.g. that slouch, lean, have obliquity, are young etc.) to give more detailed indication and contraindication information – aim to build evidence in science – not just marketing spin.
 - May be capacity to build information on what we know (knowledge translation) and ensure that we recognise that the demand will come from an ageing population, often associated with dementias and in other furniture/surfaces.
 - Utilise the monitoring/logging technologies and sensors to gather meaningful data on how people load their tissues over several days – may give the basis for early warning user monitoring.

Industry Workshop – Barend ter Haar

Points for consideration

- Industry needs affordable + accessible + repeatable + relevant standards that also integrate with other standards
- Shear needs to be considered in dynamic seating environment not just static
- Any standards need to concentrate on Clinical Relevance

Other factors in any proposed standard(s) need to take into account:

- Role of clothing
- 'Recovery' time and ability of materials in support surfaces
- Relevant thickness of test support surface
- Lying vs seating continuum
- The apparent research disconnect between support surface and deep tissue behaviours needs to be addressed
- Any guidelines must be pragmatic
- Need to avoid risk of misrepresentation by procurement
- Any standard must be future proof
- Ageing of product needs to be included