

TIG Next Steps & Testing Tasks
4/27/03

- A. Heat Dissipation / wetness / temperature
- Steven Reger and Eric Flam will work on test methods related to moisture removal at defined temperature. (Eric F)
 - Identify test methods related to heat dissipation that are relevant to tissue integrity (Evan C)
- B. Standardized Indenters & Mannequins (Evan, Charlie, Laura, Dave B & Eric)
- Each work group will focus on which indenters / mannequins are appropriate for the tests they will be developing and the unique characteristics that provide value to the tests. (Charlie L)
 - Work group leaders of areas working on tests utilizing indenters / mannequins will communicate to start identifying consistencies and variations.
 - Develop an annotated list of specific indenters and mannequins available via literature search and what is currently used. In addition the task will have the goal of identifying pros and cons of existing products. Eric Flam will serve as facilitator but must have participation. Additional questions / requests will be posted via the listserve. (Eric F)
 - Literature search performed regarding material properties on the indenter. Action item will be to extending literature search into the area of impact dampening. (Laura E)
 - Define the use of indenter / mannequin for tests of alternating pressure, temperature, sliding resistance, shear, pressure and envelopment
 - Evan will develop proposal to produce an indenter – pursue grant application / funding.
 - Need to identify what specific indenter(s) / mannequin(s) we need and develop / submit a grant application to produce.
 - Should we actually make something?
- C. Alternating Pressure (Charlie L)
- Analysis of existing literature / studies - ongoing
 - Identify tissue-like indenter(s) to be used initially – work with indenter group
 - Identify reference surface for pressure
 - Develop “draft” test methodologies and protocols for potential pressure variables (Mean P(t), % Cycle < 10, 20, 30 mmhg, Pressure Cycle Amplitude, Mean Duration)
 - Identify additional test methods beyond interface pressure (IFP) characterization
 - Additional items that Charlie identifies later
- D. Friction (Rick F)
- Develop recommendations for test method(s) relative to friction that addresses multiple layers, wet vs. dry, etc.

- E. Shear (Charlie L)
- Analysis of existing literature / studies - ongoing
 - Identify tissue-like indenter(s) to be used initially (data set)
 - Identify mid-range reference surface
 - Standard indices, Trial # for comparison of test
 - Standard horizontal stiffness tests
 - Shear sensor work at prolonged intervals vs. prolonged horizontal stiffness
 - Posture / position and the bed frame relative to shear as part of the protocol
- F. Envelopment / Resistance to bottoming (Evan C – lead, with Dave B, Laura E and Stephen S) F and G must work together
- Explore bottoming resistance with increasing load
 - Investigate other types of indenters
 - Consider the difference between rigid and compliant indenters relative to deformation.
 - Develop a specific definition for envelopment (conform and contain – more surface area for the same amount of immersion, even distribution, deform the surface not the tissues) and a correlated test
 - Develop a specific definition for resistance to bottoming and a correlated test.
- G. Interface Pressure, Spatial Pressure Gradient & Contact Area (Laura E) F and G must play nice
- Consider the impact of each measurement relative to time and identify where testing over time should be incorporated
 - Develop indicators based on current pressure mapping technologies that are reliable and repeatable
 - Research creep inherent in body under sustained load, pressure mapping systems and support surfaces and ways to separate them (Laura Edsberg).
 - Ways if analyzing pressure mapping data to extract performance indices (e.g. Pressure gradient).

TIG Workgroup Meeting Minutes: 4/27/03

Meeting called to order 10:10 by Dave McCausland (DM) and David Brienza (DB)

Housekeeping- Attendance and Agenda/documents distributed. Asked whether or not additional items should be added to agenda.

Document numbering addressed. Asked submission be electronically.

Minutes distributed Angie Doan (AD) motioned to approve as admitted, seconded and approved.

New documents submitted for numbering. Minutes of conference calls to be included.

Discussions-

Mannequins and Indenters-

Eric Flam (EF) offered definition of direction. A group effort to identify what is currently in use and what is in literature to build up a history of methodologies of indenters. Used as a backdrop for development of new tools.

At this point, only one response. Suggests that additional efforts to obtain information is necessary. Not capable of building the profile from literature search only.

Charles Lachenbruch (CL) went on record saying that most researchers are not happy with what they are using and wouldn't be very happy to have it included in a formal document.

EF responded that all information, even weaknesses, if important to building a composite leading to new technology.

Evan Call (EC) mentioned message regarding Northwest Testing Labs and AM mentioned earlier message on Scales mannequin.

Janet Cuddigan (JC) asked that all information collected be put into the numbered document list.

EF says if all information comes in as anticipated, should have working document prepared by October meetings.

Tissue Property Lit Search-

DB mentioned that on March conf call discussion on material properties of indenter. Not much knowledge, so DB had a search prepared. Submitted document for inclusion into TIG Documents list. Finalized document to follow.

Much work available on types of materials, types of indenters used, and how data evaluated (modeling). Subcategories were developed.

In particular, impact dampening was discussed as being potentially important, but an area that the literature search came up empty. Asked to have focused effort on this subject.

Proposed that this information will be valuable in designing our indenter.

Gel & tissue Characterization- Evan Call (EC)

EC Presented test apparatus and offered information establishing validity.

Presented series of tests, including human bicep testing, on various materials.

Showed models of buttocks indenters and explained how we might be able to evolve into larger torso pieces. Discussion of photo modeling and digitizing as a way to produce more stable indenters.

Discussion of need to identify what deforms first, indenter or surface.

Alternating pressure-

Discussion on need to consider using indenter on AP to measure altitude of pressure change and duration regardless of whether interface pressure has much to do with effectiveness of modality.

Heat dissipation, wetness and temperature-

EC says measuring heat and moisture at indenter / cushion interface is possible using a fluid with known humidity and measuring transfer at the surface level.

Friction-

Rick Fontaine (RF) suggested that friction may be too variable to include in support surface evaluations. Testing for friction coefficient of cover materials already exists and may serve the purpose.

At this time, there is no research that indicates the minimal amount of friction necessary to reduce slipping and maintain stabilization while reducing total amount of shear.

Mannequin shape- Possible to use crash-test dummy for shape. Clinicians agree that the concept of using a full body are desirable, but may be too costly to develop. Regardless, multiple body parts are necessary. Should see about getting research grant to develop as may benefit other industry. Prioritize, sacrum, heels, IT's.

Resistance to envelopment-

DB stated that most work was done by Stephen Sprigle (SS) and presented at last meeting. Most of the concern is with the indenter. Consider ongoing work item.

Discussion about envelopment and immersion. Envelopment is conformity, immersion is how deep is one explanation.

SS offered envelopment ability of surface to contain buttocks and accommodate for bony prominence and protrusions. Ability to conform. Immersion a linear measurement.

Discussion of types of bottoming, amount of immersion, and envelopment. May all be different work items. SS, EC, and DB will come up with work items. SS recommends that we expend some of the funds on hiring help to develop these tests. May investigate tissue deformation. Comparisons with rigid and compliant indenter looking for minimal difference as a measure of compliant surface.

Alternating Pressure-

CL and Alistair McLeod (AM). CL reviewed variables and presented new findings comparing mannequin, gel-butt, non-rocking gel-butt, and human subjects for heel, sacrum, and, ischial tuberosity.

Conclusions, some support that some interface pressure data may be surrogate for physiological data. The use of mannequins is more repeatable than human subjects, but may be optimistic.

Discussion on pressure as being the useful measure. Suggested that the multiple low pressure levels may be useful in reflecting various levels of blood flow.

Anecdotal feed back on clinical issues that may affect physiological and clinical outcomes.

Friction- Based on earlier work, RF recommended that friction testing utilize existing standards for friction co-efficient that may already be offered by the textile manufacturer.

Shear- CL discussed Horizontal stiffness and sliding tests. Interested in validating tests by using shear sensor (Vista Med). Will continue to seek validation using human model.

Presented some data for consideration.

Quick review of historical work items as identified on 10/28/02.

Updated work assignments and tasks reflected on TIG Task list dated 10/28/03.

Meeting adjourned at approximately 3:45 PM