Heat Dissipation in a Custom Molded Seating System

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Paper Presentation
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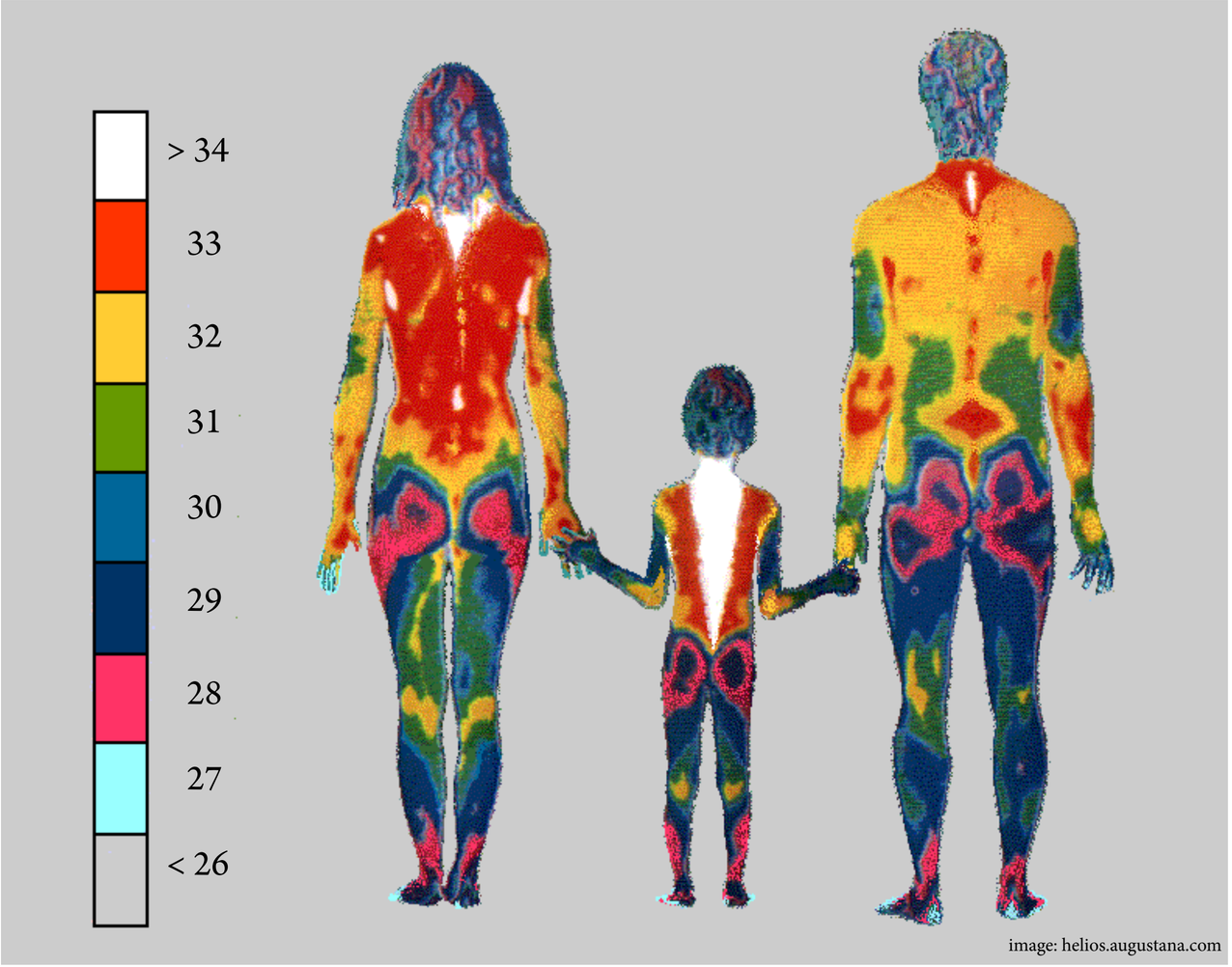
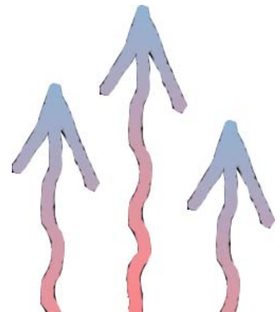
Purpose

Improve body heat dissipation for clients positioned in custom molded foam seating systems

Heat Build-up in Seating System

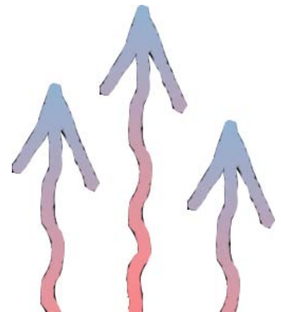


30% of
body in
contact with
seating system



Current Practice

3-D Spacer-mesh



Literature Search Strategy

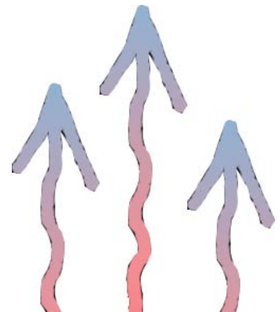
Cut-off: November 2015

Terms: Heat and/or Moisture and Seat*

Sources: Academic: Google Scholar; EBM Review;CINAHL; PubMed; Embase

Industry publications (incl. ROHO, Ride)

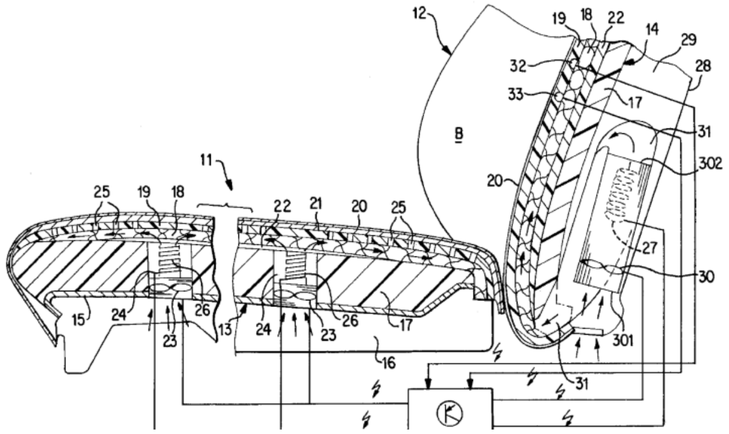
ISO standards, Patents, Engineering literature

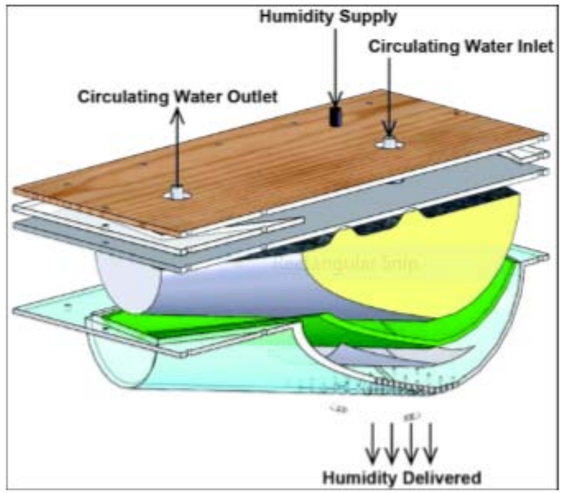


Literature Search Yield

Not a new problem for healthcare, auto-motive, aerospace

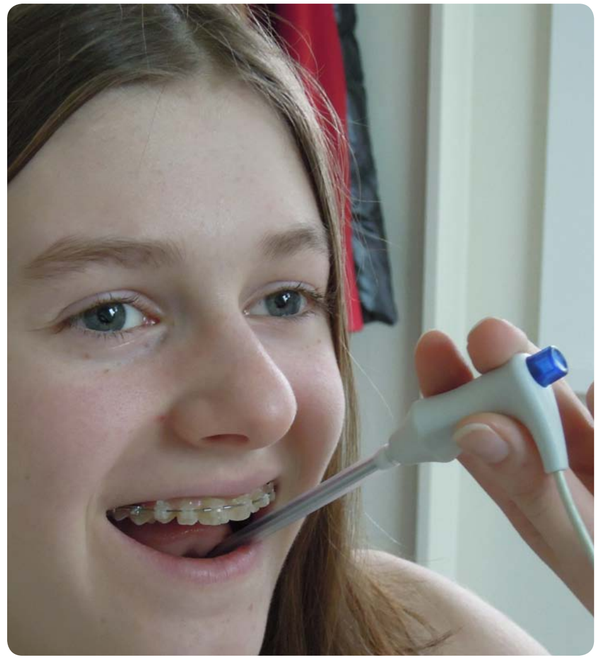
ISO 16840 (2014) = test method for measuring perspiration dissipating char-acteristics of wheelchair cushions

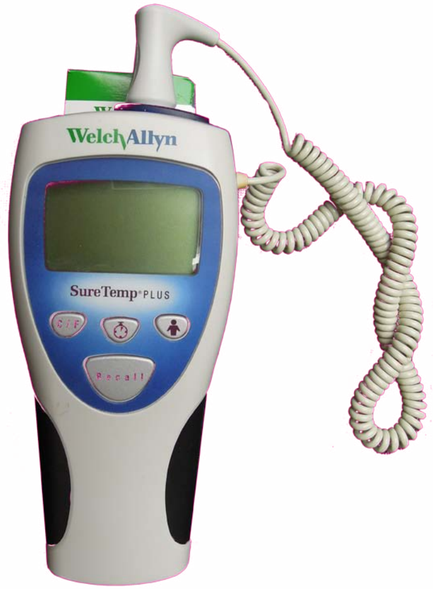




Application in custom-built seating environments?
price, production scale, technological complexity

Experiment Protocol: Measuring Temperature

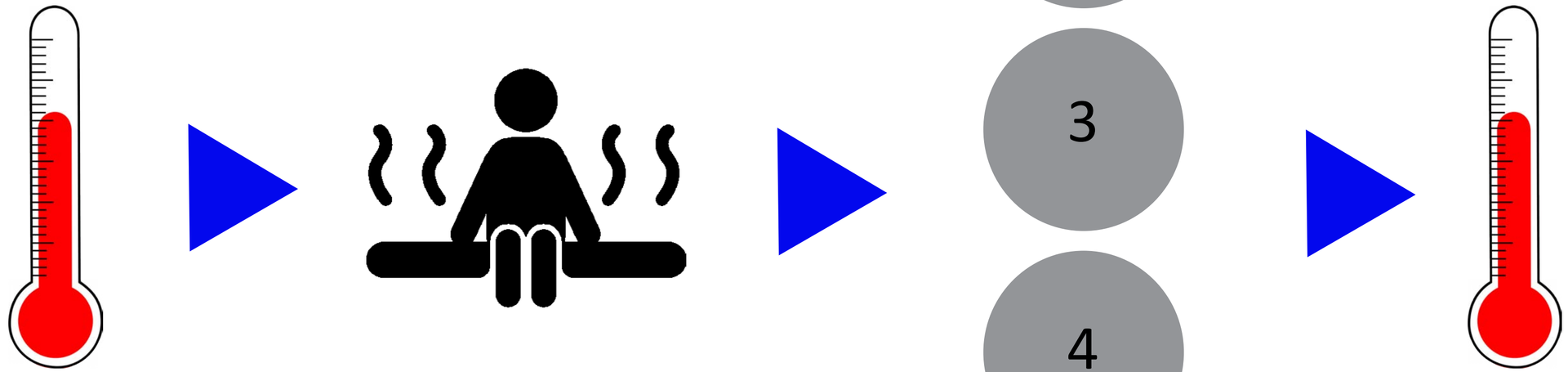




Bedford Scale

- +3 Much too warm
- +2 Too warm
- +1 Comfortably warm
- 0 Neutral
- -1 Comfortably cool
- -2 Too cool
- -3 Much too cool

Experiment Protocol



10 x

1

2

3

4

5

30 x

Experiment Protocol

1

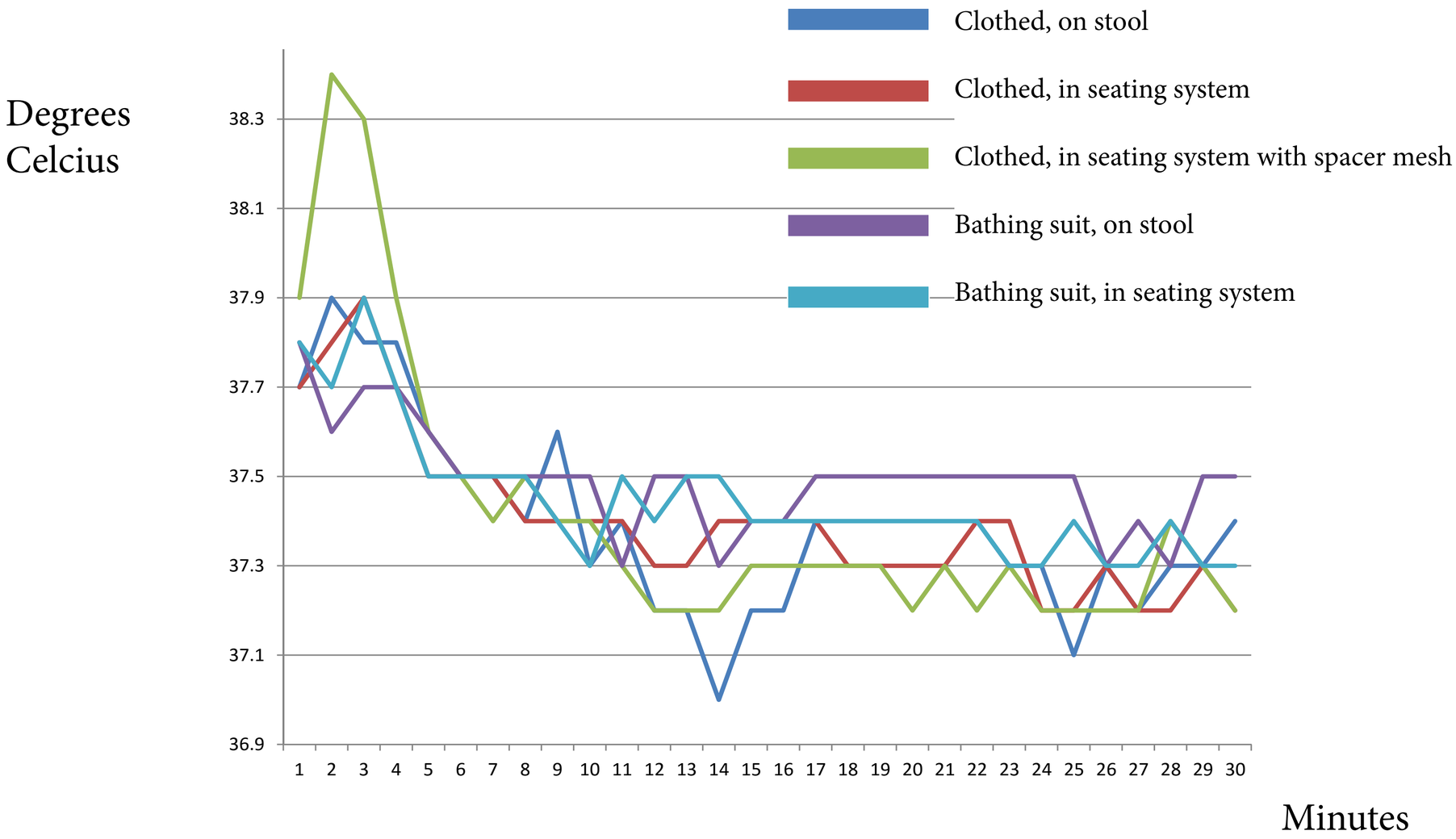
2

3

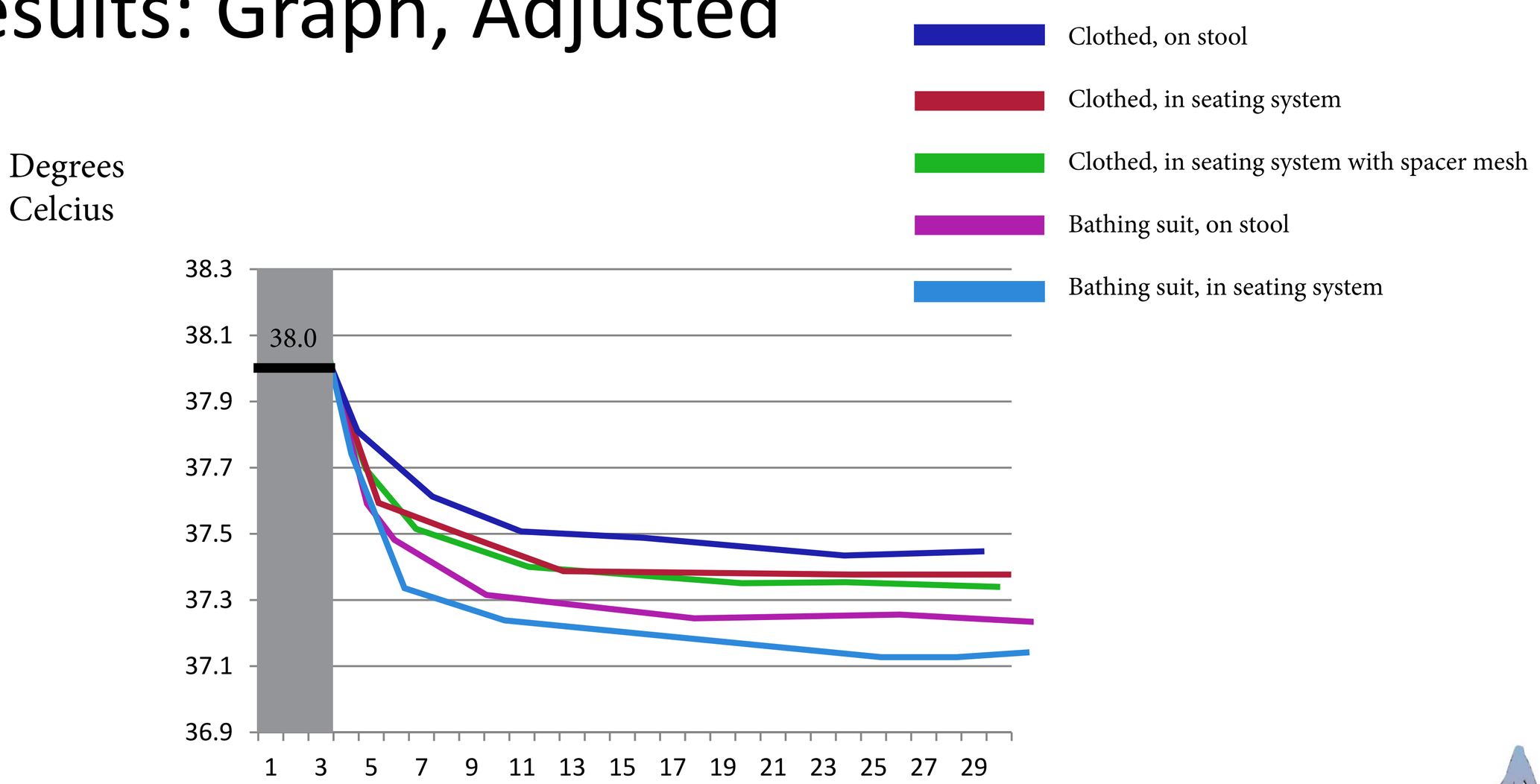
4

5

Results: Graph

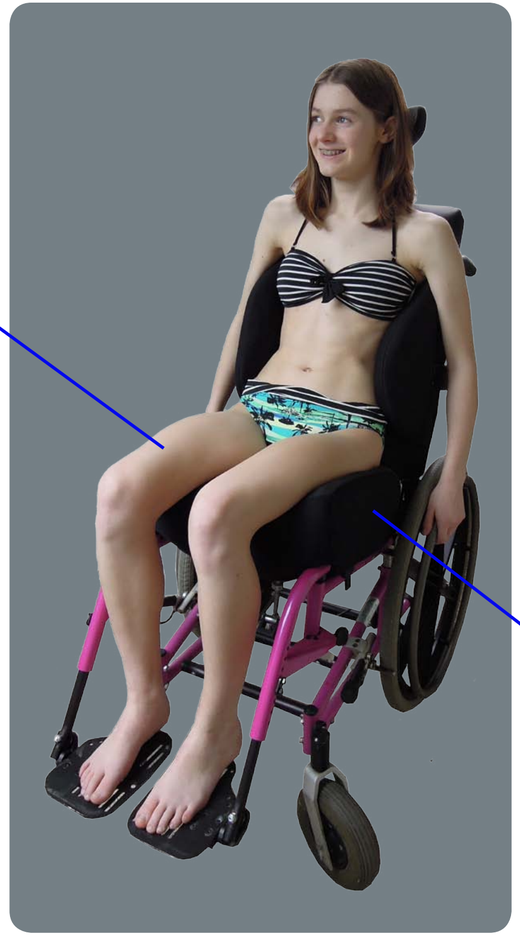


Results: Graph, Adjusted



Results: Analysis

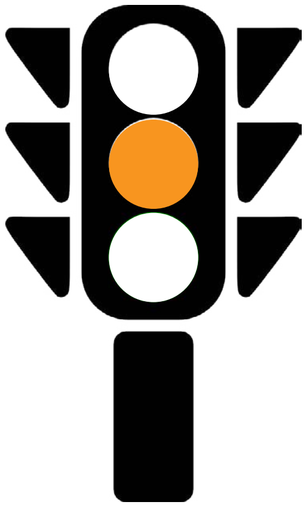
Body = 38 deg C



Seat = 23 deg C

Conclusions

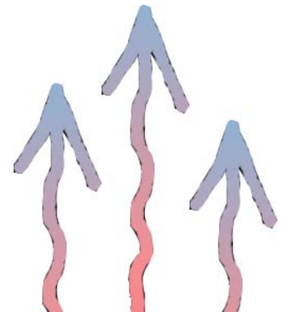
Spacer mesh did not make a discernable difference



Are results clinically useful ?

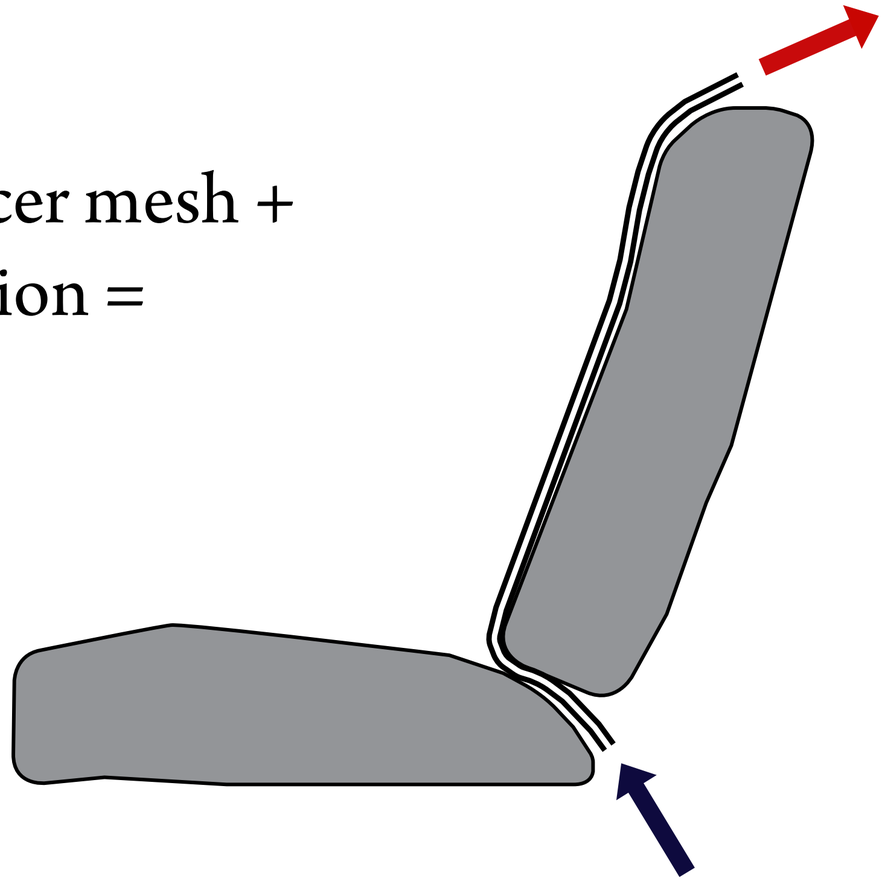
Is testing methodology viable?

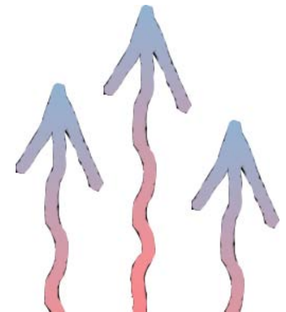
Focus on local or global heat management ?



Reflections

3-D Spacer mesh +
Convection =
Airflow

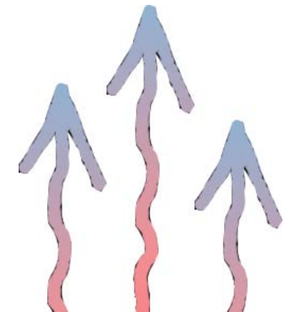




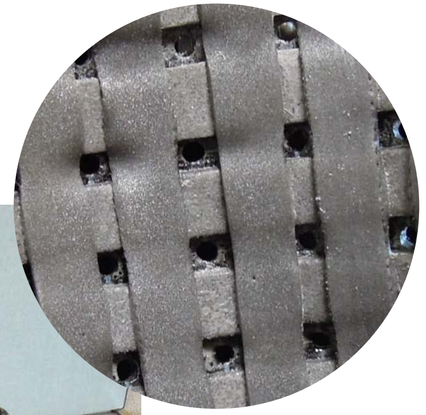
Further Research Directions

Optimize seating system
- Passive cooling
- Active cooling

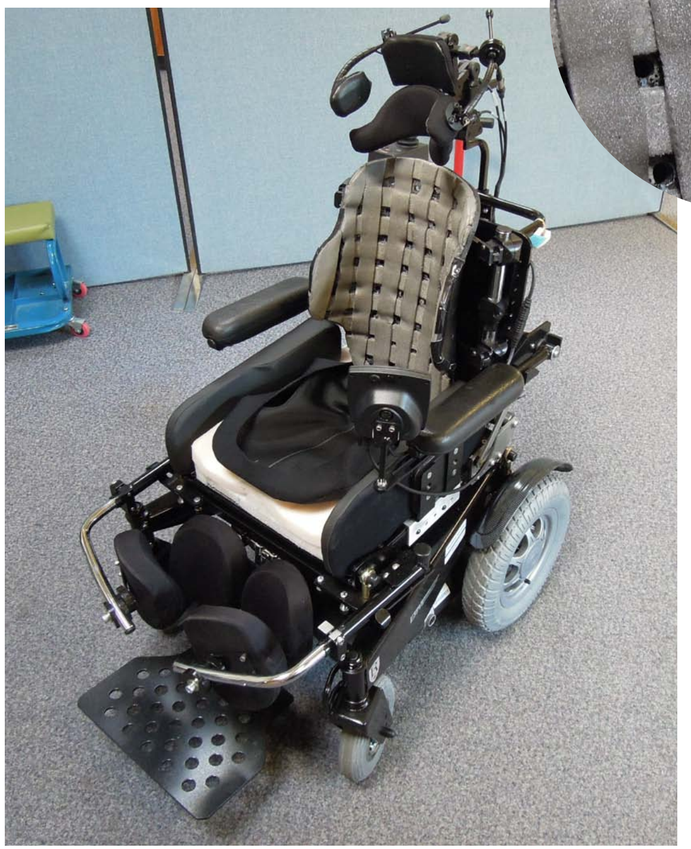
Optimize clothing
- Cut
- Fabric



Ongoing Innovation at Sunny Hill

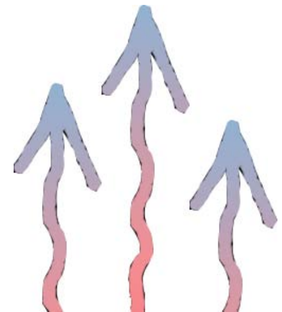


Water flow



Perforated padded shell

Cold Rush by Ossur



Discussion & Questions

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