

# Spine Buddy

An Evaluation of Sitting Application



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## Preliminary Analysis

- Factors to be considered for chair study:

- First impressions
- Comprehensibility
- Comfort

- Factors to be considered for car study:

- Comprehensibility
- Comfort
- Distraction



- Factors to be considered for chair study:

- First impressions
  - Initial opinion of Spine Buddy
  - General attitude towards soft vs. firm side
- Comprehensibility
  - Ease of application (speed)
  - Knowledge of where to place T part
  - Use actively or passively
- Comfort
  - Soft and firm
  - Preferred side (soft vs firm), preferred chair (high vs low)
- Universal design
  - If users' dimensions change interaction with and effectiveness of product

- Factors to be considered for car study:

- Comprehensibility

# Measurements

## Participants Measurements

	Back Length (inches)	Shoulder Width (inches)	Hip Width (inches)
Maximum	20.5	19	17
Minimum	17	13	12
Average	18.7	15.7	13.2

## Spine Buddy Measurements

Soft: 21" x 6.5"

Firm: 21.25" x 7.38"

## Test Process

Step No.	Type of Chair	Type of Spine Buddy	Time(Min)
1		Pre-test Survey	4
		Take pictures	
		Measure Body Dimensions	
		No Spine Buddy test	
2	Low back	Firm	1
3		Comfort Worksheet and Interview	4
4		Soft	1
5		Comfort Worksheet and comparison Interview	4
6	Break		1
7	High back	Firm	1
8		Comfort Worksheet and Interview	4
9		Soft	1
10		Comfort Worksheet and comparison Interview	4
11	Final Interview		3
Total			32

## Results - Observation

- Observed participants while using the Spine Buddy
  - To evaluate if the design is easy to use
  - To evaluate if users understand how to use the product correctly
  
- Check Item 1
  - Installation Time
    - No participants installed the Spine Buddy on the chair for more than 30 Seconds

The installation time is pretty short, so the design should be quite easy to use.

## Results - Observation

- Check Item 2  
Does the user place the top of Tee across the middle of the neck and rest the skull on it?



High+Firm

High+Soft

Low+Firm

Low+Soft

The reason why subjects did not rest their neck on the T part probably because the limited length of the chair back. The length is too low to let subjects rest their neck when leaning back.

## Results - Observation in Car Testing

- Check Item 1  
Installation Time
  - Less than 20 seconds
- Check Item 2:  
Place T near the neck?
  - User placed T near the neck
- Check Item 3  
Use product actively?
  - User used it passively
- Check Item 4:  
Did any distractions happen?
  - Distractions increased when accelerating



The subject reported that his back felt uncomfortable when speeding up. And this cause some distractions.

## Net Discomfort Scores

### Most uncomfortable combination:

Firm on High back chair (7.0)

Firm on Low back chair(5.5)

Soft on High back chair(1.0)



### Better-off cases

Soft on Low back chair(-3.0)

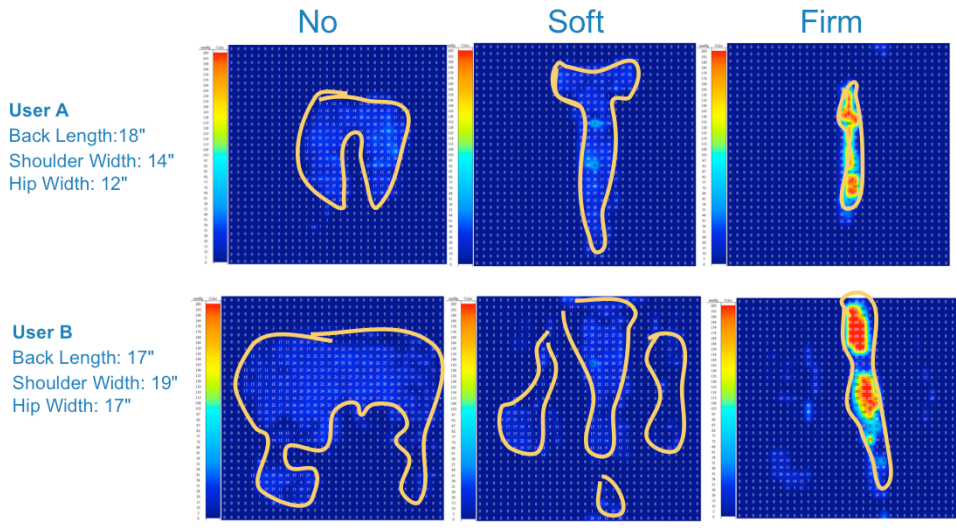
Soft on Car seat (-1.5)

### Most uncomfortable body parts:

Head and neck(3.22) and Upper back(2.6)



# Results - Low Back Chair



Pressure is concentrated on upper back and mid back

# Results

## Comparison Interview:

For what reasons did the users prefer the soft Spine Buddy?

- pressure: evenly distributed pressure
- contour: molds to spine shape
- angle: doesn't force user forward
- size: lower profile than firm model
- familiarity: more like using a pillow than a massage aid

For what reasons did the user prefer the firm Spine Buddy?

- size: top Tee is small and fits user's neck better
- active use: massage effect

The second part of our interview focused on the comparison between firm and soft Spine Buddy

Participants preferred the soft spine buddy because of...

However, those participants who preferred the firm spine buddy pointed out...

## Final Interview

### User Suggestions:

- 1) shape can be adjusted manually/automatically to mold the spine better, or use memory sponge
- 2) half cylinder rather than cylinder;
- 3) support for left and right side of the back;
- 4) add top buckles so the reversed one would be separable;
- 5) provide lumbar support, like make it I shape;
- 6) less firm;
- 7) customize appearance,

## Suggestions

### Adjustability:

size  
contour  
length

The head/neck rest able to change width and long part able to bend to match contours of spine.

Length should extend when needed.

Sizes decided by anthropometric data to fit the widest range of people.

size: head/neck rest (top of T) was fine for some users but not for others

contour: users disliked when the Spine Buddy pushed hard on some parts of their backs

length: some users unable to use T at the right place

Making Spine Buddy adjustable would allow it to fit more users comfortably.

## Suggestions

### Usability:

active or passive

duration of use

placement

When to use actively or passively.

Instructions included on how long to use.

Diagrams to explain that T-shape goes on neck.

active or passive: users don't know to use as massage or use as support

duration of use: users don't know options of all day use vs. periodic use

placement: users don't know to place top of T at base of neck

movement: cylinder rolling and loose elastic makes the Spine Buddy move

how to use

whether to actively use or passively

how long to use

put t shape on neck