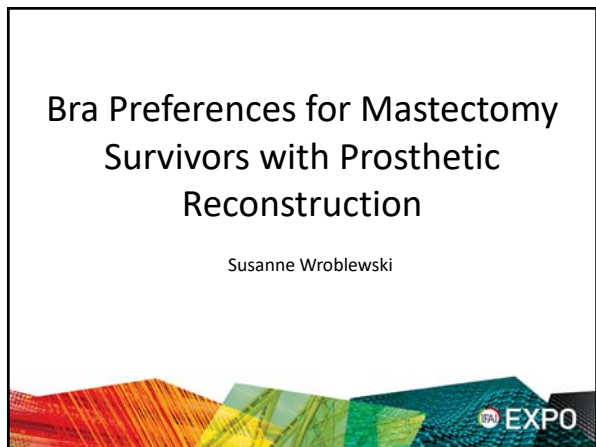
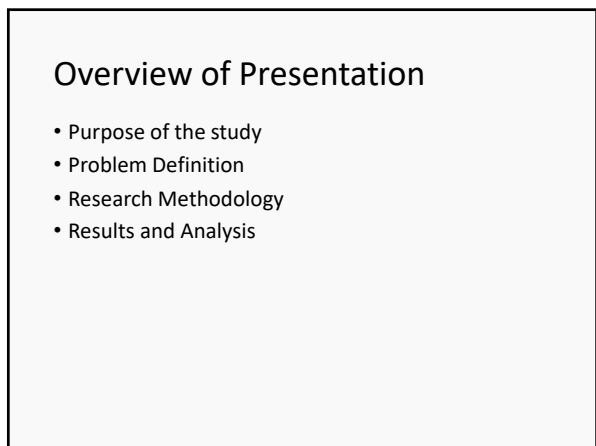




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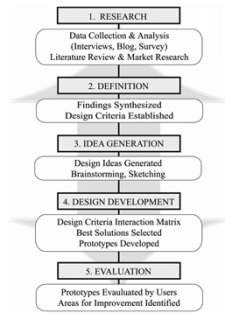
3

Purpose of this Study

- One in eight women will be diagnosed with breast cancer
- This study was undertaken to survey breast cancer survivors to determine design specifications that can be used to create bras that specifically meet the needs of this user group.

4

What is User Centered Design?



5

Who?
What?
When?
Where?
How?
Why?

6

Who...is impacted?

- *It is estimated that 268,600 new cases of invasive breast cancer will be diagnosed in 2019.*
- *There are over 3.1 Million Breast cancer survivors in the US alone.*

7

When...is it diagnosed?

- *Most cases of breast cancer are diagnosed between 40 and 70 years of age.*

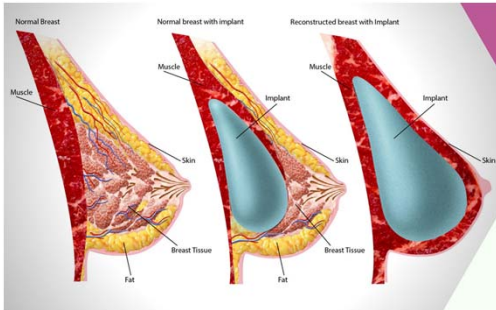
8

How...is it managed?

- *Lumpectomy*
- *Mastectomy*
- *Reconstruction*

9

What...is reconstruction



10

Where... are side effects found?

Treatment Related

- Lymph node removal*
 - Lymphedema*
 - Asymmetry*
- Radiation*
 - Uneven surface*
 - Incision sensitivity*

Implant Specific

- Cold breasts*
 - Breast shape*
- Capsular Contracture*

Medicine induced

- Menopause – hot flashes*

11

How...do current Bra styles work

- *Many styles*
- *Many functions*
- *Features impact style and fit*
- *Wide disparity of sizing*
- *Fit is subjective*
- *Common terminology is important*

12

Why... are Breasts important?

- *Breasts are a symbol of femininity*
- *Losing one's breasts can contribute to feelings of deformity
loss of femininity
loss of identity*

13

Problem Definition

How does mastectomy and prosthetic reconstruction impact the bra needs of breast cancer survivors?

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Bra Styles - The Bra Guide -

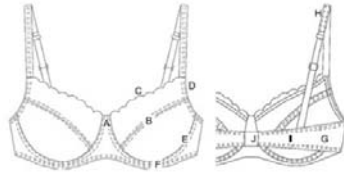
A Beginner's Guide To Common Bra Types

	Bralette A non-underwire bra with no padding or molded cups		Push Up A bra with additional padding at bottom of cups to create fuller bust
	Demi A bra with under-wire straps, half-shaped cups and horizontal bust line		Plunge A bra with low cut cups joined by thin center piece
	Balconette A low-cut demi bra with a rere silhouette		Full Cup A bra with cups that completely cover the breasts
	Bandeau A bra designed in a strip typically made of stretchy fabric		Strapless A bra designed without shoulder straps
	T-Shirt A bra with thin and smoothly contoured cups to give optimal shape under t-shirts		Minimizer A full coverage bra designed to reduce appearance of bust size by 1-2 inches
	Convertible A bra with detachable straps designed to be worn multiple ways		Sports A bra designed to support and prevent discomfort during physical activity

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Bra Features

- A. Gore
- B. Cup
- C. Neckline
- D. Underarm
- E. Wire
- F. Cradle
- G. Wing
- H. Strap
- I. Underband
- J. Fastener



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Bra wearers and mastectomy survivors

- Healthy breasted women have varying bra needs throughout their life.
- Mastectomy survivors (no matter their age) want to wear the same clothes they wore pre surgery

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Research Methodology

Mixed Methods approach

objective – Likert style responses

subjective – open ended questions

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Survey Instrument

Demographics

- How would you characterize your level of physical activity?
1 =Extremely inactive 3 = Neutral 5 =Extremely active
- How would you rate your socioeconomic status?
1 =Not able to make ends meet 3 = Neutral 5 =Very comfortable
- To what degree does your medical insurance cover post reconstruction bras?
1 =Extremely inactive 3 = Neutral 5 =Extremely active

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Breast Importance

**Rate your response from 1-5 where when
1 =Disagree 3 = Neutral 5 =Agree

- I use my breasts for seduction.
- I am proud of my breasts.
- My breasts are part of my femininity.
- My breasts provide life and nurture.
- My breasts are important to me.
- My breasts are:

20

Favorite Bra Features

When trying to find a bra that fits, which features are of the most concern? Select up to three.

- Strap length
- Strap width
- Cup shape
- Cup coverage
- Cradle/support
- Closure
- Underwires
- Wing and underband comfort
- Gore

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Results and Analysis

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Demographics

- Midwestern
- Age
- Marital status
- Ethnicity
- Years since reconstruction
- Physical activity
- Socioeconomic status

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Side Effects

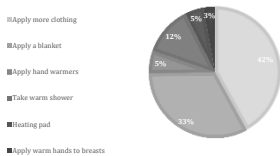
- 84% experience hot flashes.
- 100% of participants experience the cold breast side effect
- 70% experience periodic breast pain.

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Rewarming options

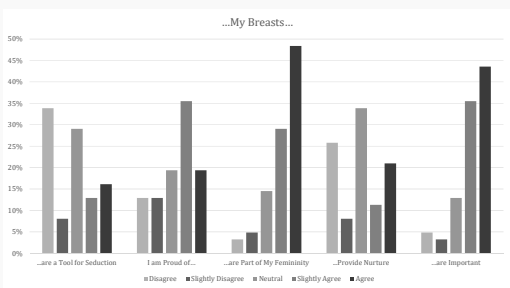
Conditions under which participants are cold	n	Percent
Cold weather or environment	33	53
Physical Activity/ sweating	11	18
Swimming	8	13
Always	4	6
n = 62		

COMMON METHODS TO REGAIN THERMAL COMFORT ONCE COLD



25

Breast Importance



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My Breasts...

- Do not define me. I am happy to be alive.
- Not as important as my life.
- An important part of my body image.
- Silicone and I now relate to them as a sign of my battle, my battle that I won. They are also a reminder that I am not invincible.
- Not who I am, but a definite part of me.
- I was definitely a lot more confident prior to my surgeries... I am learning to love myself again.
- Still a long way from normal.
- Nothing like I used to have before breast cancer. Can't even look at myself naked in the mirror.
- Were important to me. I loved them. However, the reconstructed versions are painful, misshapen, heavily scarred, and weirdly chilly, which gives them an otherworldly feel... the overall failure of these reconstructions to impersonate real breasts is sort of a bummer. I used to have lovely breasts, too. One strange thing: when I'm cold, which is often, the muscles there tic and spasm, like feelers on a creepy insect.
- No longer breasts, they are implants.
- Beautiful as before...but they don't feel quite the same.

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Bra inventory -quantity

- 28 % have purchased 1 or fewer bras this year
- 40% purchased between 2 and 3 bras this year
- 49% own five or fewer bras
- 20% own 11 or more
- 60% expect to keep a bra longer than 2 years

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Bra Inventory - types

- 90% wear a bra regularly
- 93% own a sports bra
- Only 34% own a push up bra

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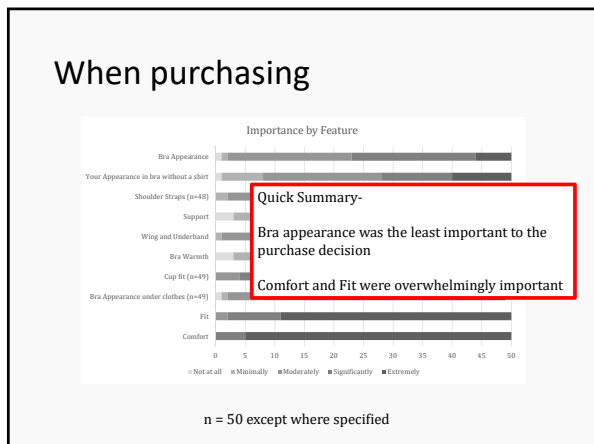
Bra Type and Feature Preferences

Bra Style	Wing/ under- band shape comfort	Cup shape	Cup coverag e	Cradle/ support	Strap width	Under- wire	Gore	Closure	Strap length	Total/ n =
T-shirt	Count 17	17	15	11	11	6	6	5	2	90
	% 5%	5%	5%	3%	3%	2%	2%	2%	1%	27%
Sports	Count 18	13	10	12	12	2	5	3	4	79
	%									
Full cup	Count									
	%									
Push-up	Count									
	%									
Bralette	Count									
	%									
Minimizer	Count									
	%									
Convertible	Count									
	%									
Total	Count 67	56	49	46	46	15	16	20	13	328
	% 20%	17%	15%	14%	14%	5%	5%	6%	4%	100%

Percentages and totals are based on responses.
a. Dichotomy group tabulated at value 1.

Quick Summary-
T-shirt and Sports bras were chosen more than any other type
Wing/Band comfort, cup shape and coverage were the most important features

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Accommodating breast differences

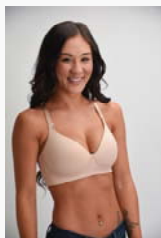
20% state that they have dissimilarly sized breasts
 8 % claim to have ultra sensitized reactions to fabric touching their skin
 Edema at the breast and underarm

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- ### Ideal Bra
- Overall comfort
 - Thermal comfort
 - Hide breast imperfections
 - Good support
 - Good cup shape
 - Comfortable adjustable band
 - Comfortable adjustable straps
 - Pretty/Stylish

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Refined Bra Design...Repeat.



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Questions?



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Thank You



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