

Tackling breast edema: from concept to reality

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Background

- Radiotherapy & breast conserving surgery
 - Safe
 - Good survival
 - Good cosmetic outcomes

But it is a risk factor for breast edema



Background

- Breast edema
 - Volume increase of 1 – 2 cup sizes
 - Incidence 0-90.4% overall (different assessments/ definitions used)
 - Objective assessments:
 - MRI = 64%
 - US = 19 – 90.4%

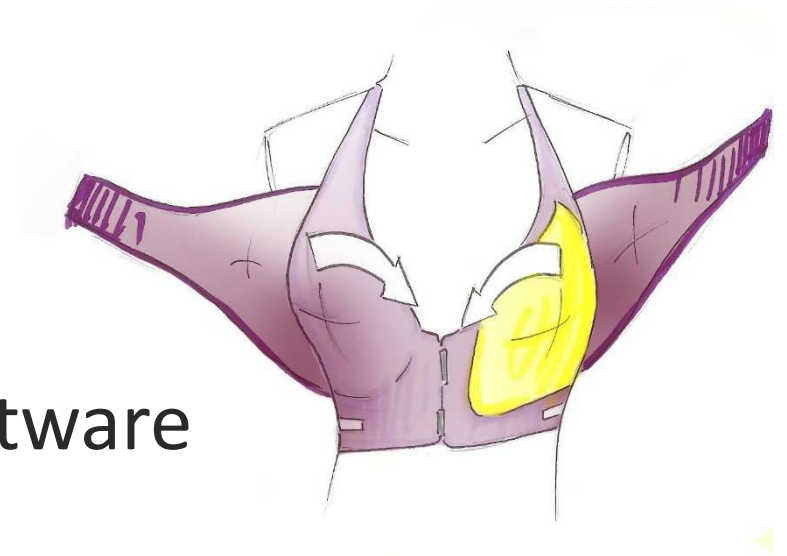


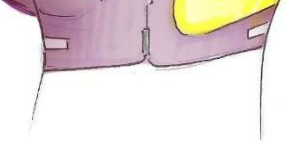
**Verbelen et al., 2014 Breast Cancer
Research and Treatment**



Methods

- ## ■ Patient and healthcare professionals interviews



- Marvellous Designer software
 - Product engineering
 - Fabric specifications
 - Different cup sizes/female constitution (avatars)
- 
- A stylized illustration of a purple bra with a yellow cup, positioned in the top right corner of the slide.

+ Expand all - Collapse all

Marvelous Designer Manual

+ Installation

+ Run

+ Environment

+ File

+ Avatar

+ 2D Patterns

+ Arrange Pattern

+ Sewing

+ Basting

+ 3D Garments

+ Expression in Details

- Fabric

+ Use Fabric List Window

- Set Fabric Properties

+ Change Fabric Name

+ Set Fabric Texture

+ Set Fabric Color

+ Set Fabric Gloss/Opacity

- Set Fabric Physical Properties

+ Presets

- Set Detailed Physical Prop...

+ Adjust Stretch-Weft, Stretc...

Set Detailed Physical Properties

Created by Anonymous, last modified by clo on Sep 15, 2015

Physical Property

Preset: S_Collar_with_It

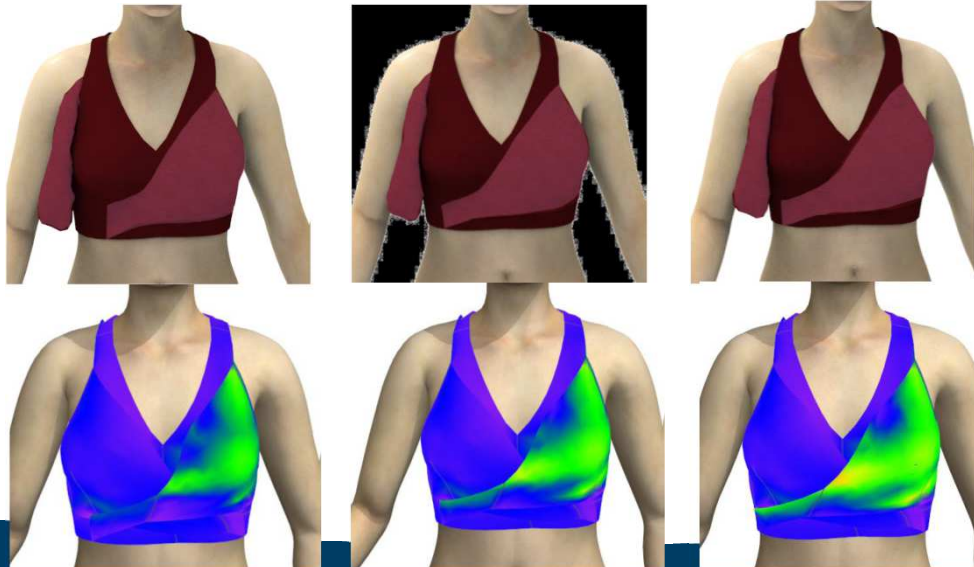
Detail

Stretch-Weft	32	
Stretch-Warp	32	
Shear	32	
Bending-Weft	65	
Bending-Warp	65	
Buckling Ratio	1	
Buckling Stiffness	90	
Internal Damping	1	
Density	35	
Friction Coefficient	3	



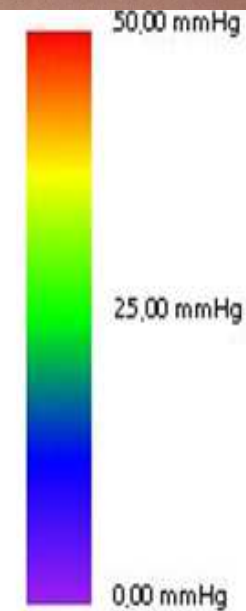
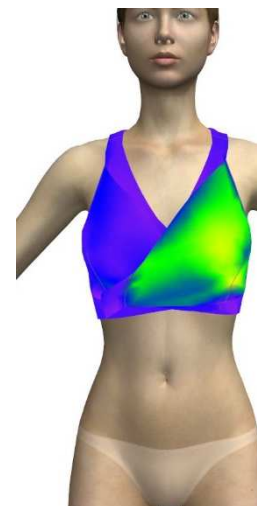
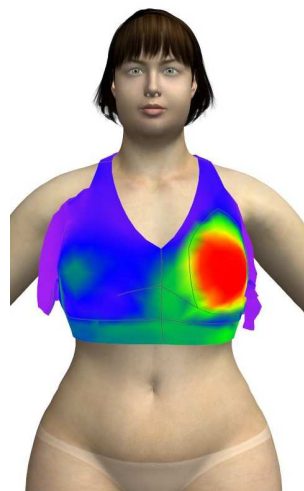
Results

- Concept
 - Basic bra with woven cup
 - Inlay, inflatable compression pad
 - Wrappers (L/R)



Results

- Closing in the front
 - Magnetic closing
- Pressure in relation to cup sizes and constitution



Concept bra



CoBra-trial (NTR 5726)

Custom made CoBra-Healthy

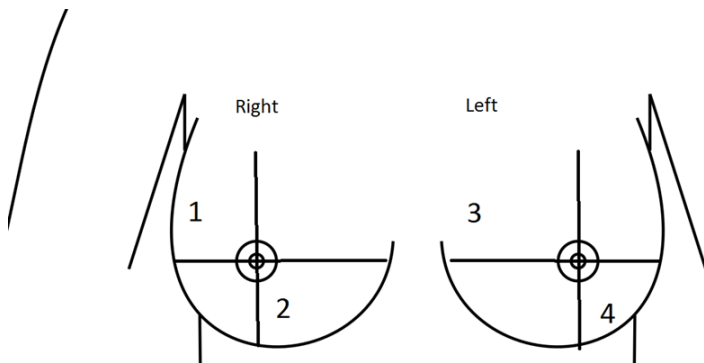
- Several compression bras already available, some are custom made.

- Research question:

What is the magnitude of the pressures delivered by a custom made compression bra, currently available?



CoBra- Healthy

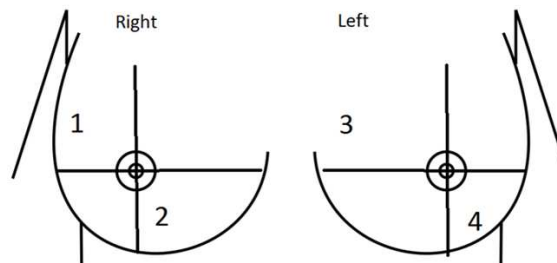


Healthy	Age	Weigth	Length	BMI	Bra size
1	40	54 kg	175 cm	18	70-75 A
2	35	85 kg	159 cm	34	85 D
3	33	67 kg	159 cm	27	85 B
4	60	71 kg	165 cm	26	110 C

CoBra-Healthy

Pressure mmHg*	Q1 T0	Q2 T0	Q3 T0	Q4 T0	Q1 TOPA	Q2 TOPA	Q3 TOPA	Q4 TOPA	Q1 T1	Q2 T1	Q3 T1	Q4 T1
Healthy1	8	7	7	9	6	8	8	9	6	8	5	9
Healthy2	7	9	6	12	6	11	5	14	4	9	4	11
Healthy3	7	8	7	7	6	14	6	9	6	14	6	9
Healthy4	6	10	7	9	6	11	5	10	6	11	5	10

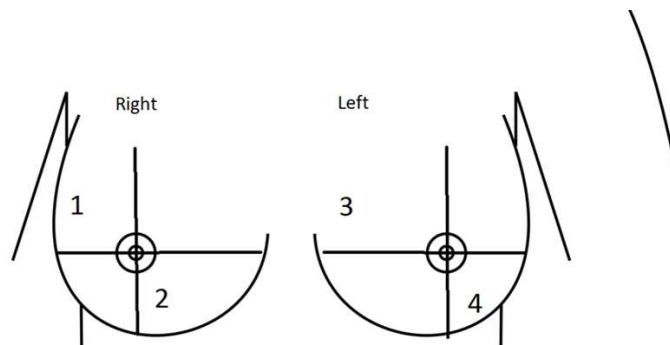
* All pressures measured
in standing position



CoBra-Healthy

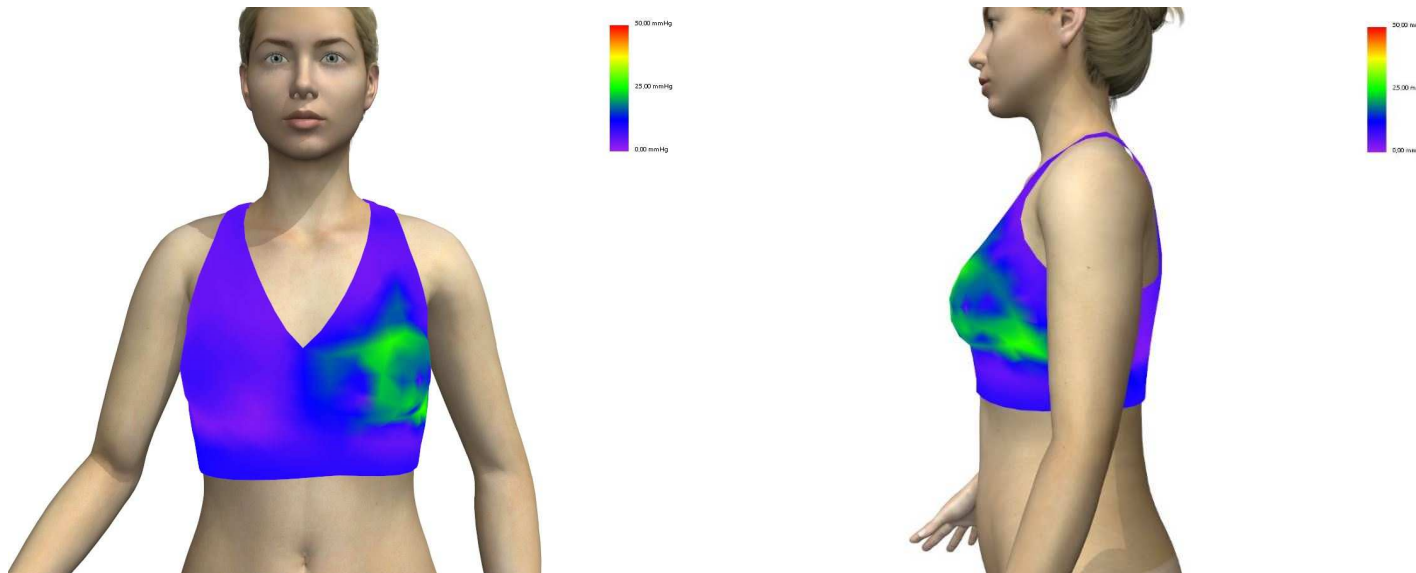
Pressure mmHg*	Q1 T0	Q2 T0	Q3 T0	Q4 T0	Q1 T1	Q2 T1	Q3 T1	Q4 T1	Q1 range	Q2 range	Q3 range	Q4 range
Healthy1	9	7	10	9	7	6	5	8	6-13	5-11	3-9	6-11
Healthy2	8	8	6	10	5	3	3	6	3-6	2-4	3-5	5-8
Healthy3	7	17	6	11	6	7	3	6	4-9	6-7	2-5	5-9
Healthy4	6	17	6	12	5	9	4	7	3-8	7-10	3-7	6-10

*** All pressures measured
in supine position**



Preliminary conclusions

- Pressures of the CoBra correlate to the mathematical model of the basic bra but are systematically lower



Preliminary conclusions

- Pressures of CoBra are not in range of Cl1 compression:
 - Overall range in stand = 4-14 mmHg
 - Overall range supine = 2-17 mmHg
- Q3 has the lowest pressure (range 4-8 mmHg)

