Exploring the Safety & Effectiveness of the Use of Weighted Blankets with Adult Populations

2007 American Occupational Therapy Association's Annual Conference Presentation

(Modified Version)

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Acknowledgements

- The presenters would like to acknowledge and thank those who are central to this work:
  - To all of the research participants, without whom this research would not be possible
  - Professor Sundar Krishnamurty, faculty advisor for all mechanical engineering students participating in each of the studies reviewed and in future works
  - The Cooley-Dickinson Hospital administration for the continued support of researching sensory approaches/modalities
  - The staff at the inpatient behavioral health unit at Cooley Dickinson Hospital for their teamwork in helping to make studies 2 & 3 a success
  - The Nursing Department at UMass Amherst for providing the lab space and use of vital signs equipment for study #1
  - Professor Royer for assistance with statistical analysis

OT Scope of Practice: Weighted Modalities

- The therapeutic use of weight has been utilized and explored by occupational and physical therapists (rehab professionals) for many years.

- OT's using a sensory integrative approach first utilized and promoted the use of weighted vests and weighted blankets with children and adolescents with learning disabilities and pervasive developmental disorders.

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Sensory Integration Fidelity

- According to the literature on sensory integration (SI) fidelity (Parham, et. al., 2007), the application of the use of weighted blankets and vests among adolescent, adult and geriatric populations in acute inpatient mental health services may not necessarily be considered SI. Occupational therapists must understand the guidelines regarding what constitutes fidelity to SI according to Ayres and what does not (Parham, et. al., 2007).

- Currently, weighted blankets are often used in acute mental health services for sensory modulation purposes: *to facilitate self-organization, positive change and the recovery process among consumers.*

Applications for Acute Care in Mental Health Settings

- In 1999, Tina Champagne, M.Ed., OTR/L began initiating the use of weighted blankets in adult acute care mental health settings in an attempt to offer more self-controlled and individualized approaches to facilitate the consumer's ability to self-nurture, increase coping skills, increase reality orientation, and actively engage in self-care during both acute dynamic states and for prevention purposes.

- In this way, it is in keeping with the President's New Freedom Commission

  (Department of Health and Human Services, 2003)

- Over time, inter-disciplinary staff recognized its influence as an individualized, multi-sensory modality that also appeared to decrease the need for the use of seclusion and restraint

  (Champagne & Stromberg, 2004)

Most Frequently Asked Question #1:
Why is the weighted blanket used?

- *GOAL(s):*
  - *To facilitate self-care, self-nurturance, coping skills development, reality orientation & the recovery process*
  - *Sensory Modulation*
    - As a grounding technique
    - To increase reality orientation
    - To calm or relax
    - To self-sooth
    - To distract
    - To comfort one's self
    - To care for one's self
    - To facilitate engagement in the act of nurturing one's self

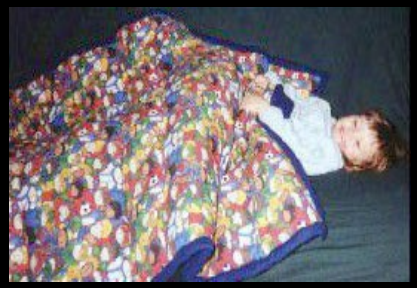
- *A tool to be used to help facilitate the recovery process!*

Weighted Blanket: *Choices…*

*Examples of Different Styles Available!

Remember: The Experience of Sensation is ***Multimodal***

Weighted Blanket:
**More Than Just Weight…*



- There are many different qualities offered by the weighted blanket.
  - Some examples include:
    - Tactile (fabric: cotton/fleece/other)
    - Temperature (warmth)
    - Weight (deep pressure)
    - Visual (pattern/colors)
    - Self controlled/self applied (not forced)
    - Affective meaning: self-holding, feeling of being held

Most Frequently Asked Question #2:

How is it used?

- Positioning: sitting down or lying down
  - *Draped over the front of the individual* **OR** *wrapped up in it* (loose or tight - based upon person's preferences)

The Importance of Meaning

- **SELF-CONTROLLED: Use of the weighted blanket is never forced! It is NEVER to be used as a restraint.**

- **When used in a self-controlled manner: it typically has "comfort" and self-care associations** (for many)
  - Conscious & unconscious
    - Swaddling/Self-wrapping
    - "Feels like a hug"
    - "It made me feel safe and more secure"

- Facilitates self-care, coping & self-nurturance

- Facilitates moving into and being in the lying down or seated position - even when distressed (with many)

Past Guidelines for Use

- In the ***past***:
  - Safety and use recommendations were based on the weighted vest and backpack literature due to the lack of weighted blanket research

    (Walker & McCormack, 2002)
- ***However:***
  - Is it **NOT** appropriate to use these guidelines since the way that weighted blankets are used is very different from the way that weighted vests have been used.

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Individualization: A Collaborative Approach

- Early quality improvement studies with consumers by Champagne demonstrated that consumer preferences varied significantly in:
  - The type of blankets preferred
  - Weight distribution
  - Amount of weight preferred and variations in preferences based upon length of time used
  - Fabric preferences
  - Warmth factors
  - The way it is used
  - Safety factors

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Initial Safety Considerations?

- A literature review of inter-disciplinary research was conducted to identify potential safety considerations and the varied goals identified for the use weighted and pressurized garments (Parr & Champagne, In press).

- Some of these include:
  - Diagnostic considerations
  - Trauma history
  - Respiratory precautions
  - Cardiac/circulatory precautions
  - Vital signs influence
  - Skin integrity including: Open wounds or fragile skin
  - Any lifting precautions
  - Orthopedic considerations: broken or fractured bones

More Safety Questions…

- Risk management departments questioned:
  - Is the use of the weighted blanket within the OT scope of practice?
  - What are the safety considerations?
  - Need to establish policy & procedure for use
  - Is there a need for medical clearance?
- More questions: But how do you know if it is safe to use?
  - Who can it be used it with?
  - When wouldn't it be used?
  - Are there any contraindications?
  - Safety factors related to use on an acute care unit?

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Most Frequently Asked Question #3: *Which One Do I Buy?*

- There are many different styles available with varied affordances & barriers. Some examples in differences in styles includes:
  - The amount of weight offered
  - Fabric choices
  - Weight distribution
  - The ability to adapt the amount of weight used in each blanket (or not)
  - Materials used as weights
  - Ease in the ability to launder
  - Ease in ability to change the amount of weight preferred

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Effectiveness: *Still More Questions…*

- How do we know if it is effective?
  - People have different tendencies & preferences
  - No one intervention will work for *everyone*
- Importance of getting to know yourself!
  - What are your tendencies & preferences?
  - Do you have the tendency to like a heavy blanket, a light weight blanket or no blanket?
  - When do you tend to use a blanket? Why?

Why Engage in Research?

- To provide consumers with *more* **safe, humane, self-controlled, effective, and person-centered alternatives** for use during crisis situations and for prevention purposes
- To engage in evidence-based practice
- To explore if and how the use of the weighted blanket "helps"
- To communicate evidence-based findings
- To promote the integration inter-disciplinary approaches to research and care delivery

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Where to start?

1. Identify the area of interest and the research question
   - **Research Question:** Is the use of the weighted blanket safe and effective among adult consumers of mental health services?

§ Conduct a literature review: Is there a need for research in this area?

- NO PUBLISHED RESEARCH WAS AVAILABLE!
  - Yes - there was a need!

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Research: An Emergent Process

- Recognized the need
  - Practice
  - Research
- Created a research partnership
  - Shared experiences
    - Practice patterns
    - Resources
- *"What do you mean there is no research?"*
  - Identified the need to start with pilot studies
  - Began with exploratory studies

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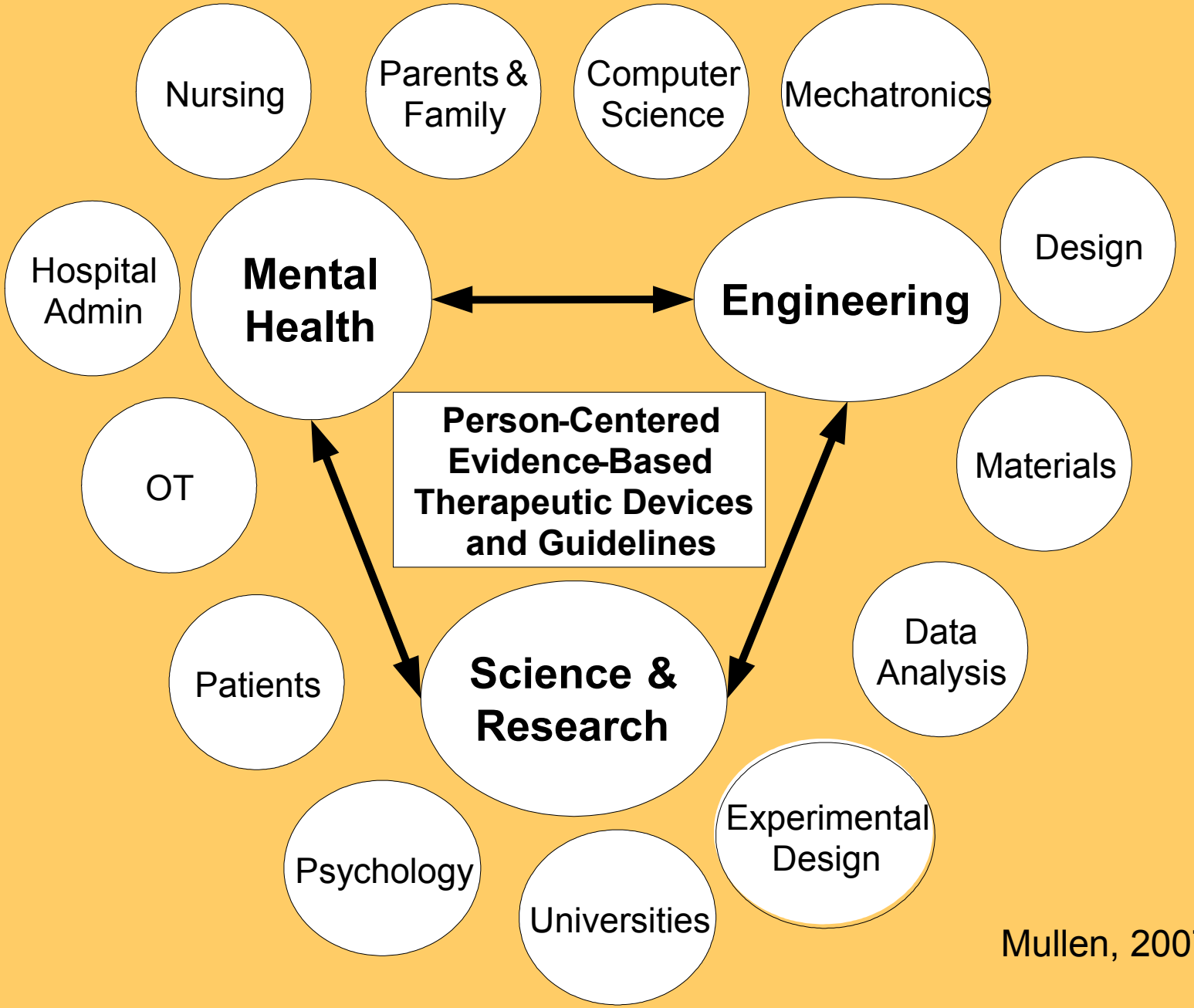
Initial Partnership

- Cooley Dickinson Hospital, Acute Inpatient Behavioral Health Unit, Northampton, MA
  - Tina Champagne, M.Ed, OTR/L

- UMass School of Mechanical Engineering
  Amherst, MA
  - Professor Sundar Krishnamurty, Ph. D
  - Professor Robert Gao, Ph. D
  - Brian Mullen, graduate student


Nursing
Parents & Family
Computer Science
Mechatronics
Hospital Admin
Mental Health
Engineering
Design
OT
Person-Centered Evidence-Based Therapeutic Devices and Guidelines
Materials
Patients
Science & Research
Data Analysis
Psychology
Universities
Experimental Design

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First Informal Pilot Study

- Developed and implemented an initial pilot study with 20 engineering students
  - Positioning, equipment & procedural exploration
- The outcome of this study and literature review lead to the decision to create a first series of formal pilot studies using a specific methodology and the lying down position for a 5 minute period
  - It also helped to create a systematic methodology for the first series of studies

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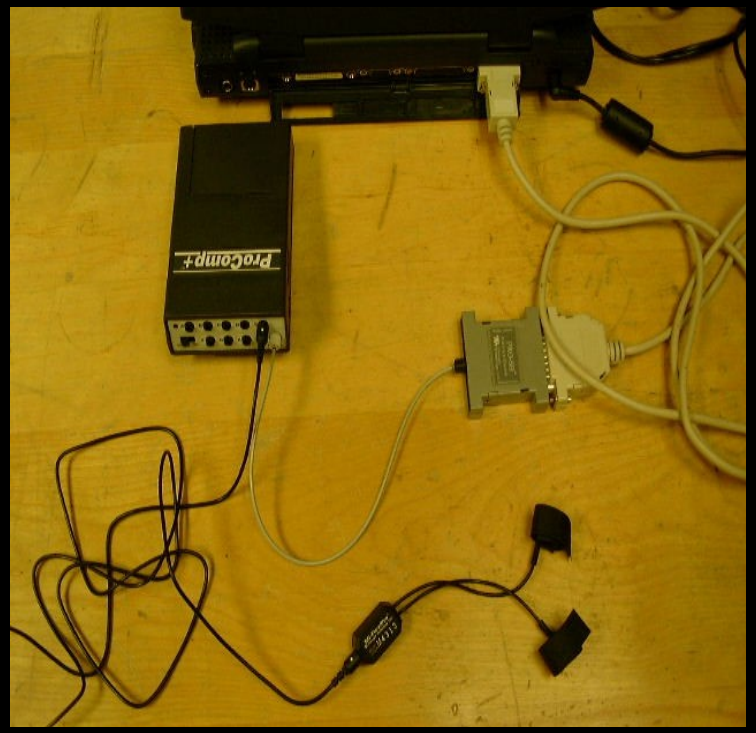
Exploring Effectiveness: *Quantitative* First Used Electrodermal Activity



- Procomp+ Sensors
  Thought Technology

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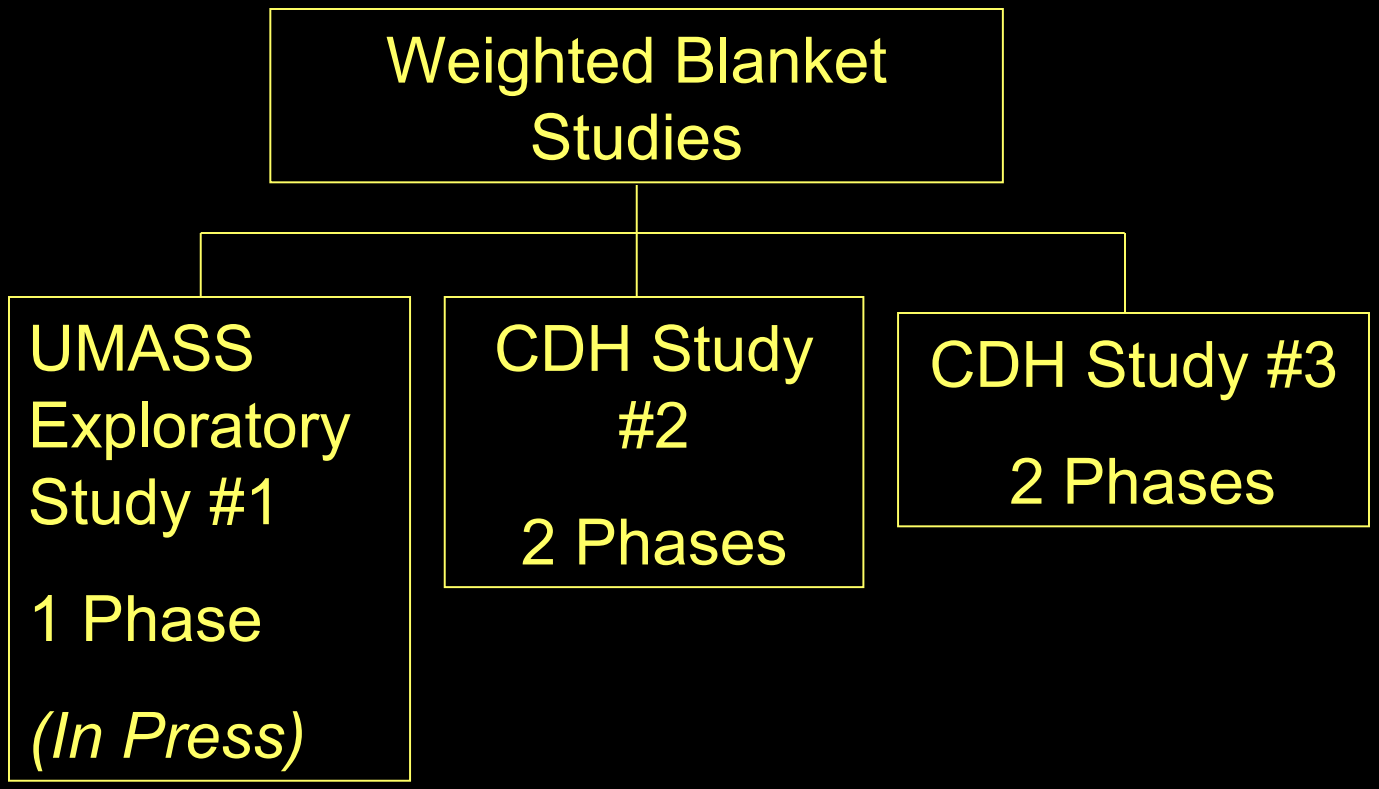
Formalized Pilot Study Plan



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Weighted Blanket Study #1: UMass, Amherst

- Inter-disciplinary created and implemented experimental design and methodology
- The Partnership:
  - UMass, Amherst, Massachusetts
    - Brian Mullen, MS (Principle Investigator)
    - Professor Sundar Krishnamurty, Ph. D
    - Professor Robert Gao, Ph. D
  - Cooley Dickinson Hospital, Northampton, Ma.
    - Tina Champagne, M.Ed, OTR/L (Co-investigator)
    - Debra Dickson, APRN, BC

Weighted Blanket Study #1

- RESEARCH QUESTION: Is the 30 pound weighted blanket safe and effective to use with adults?
  - What influence does it have on anxiety?
  - What are the participant's preferences?
  - How is it used?

- Concurrent, Nested, Mixed Methods Approach
  - Exploratory Pilot Study
    - One data collection phase
    - Crossover Design
    - Quantitative and qualitative measures
      - A common problem when using mixed methods approaches: *may result in unequal evidence*

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Sampling & Design

- A convenience sample of 32 non-acute, non-hospitalized adults (inclusion of ages 18-64)
  - Actual age range 18-58; 19 males & 13 females
  - Average age: 31
  - Std. deviation: 11.7; skewed distribution (younger)
    - **Only 30 participants data were used for quantitative analysis due to GSR sensor problems with 2 participants**
    - **All 32 were used for the qualitative exit survey analysis**

- Relatively controlled setting:
  - UMass, Amherst - Skinner Hall Nursing Labs
- Standardized procedures
  - Methodology created and researcher's trained

The Weighted Blankets

- 2 of the same style/made for the study
- 56” X 76” - Cozy Comforter
- Cotton one side/fleece one side
- Vendor: Weighted Wearables
  - ***At the time of the first study*** this vendor sold the heaviest blanket on the market (30 lbs) & was most preferred style by CDH consumers. We now offer many weighted blanket styles/varieties at CDH.

Measurement Tools

- Quantitative & Qualitative Tools Used
  - Pulse rate
  - Blood pressure
  - Pulse Oximetry
  - Galvanic Skin Response (GSR)
  - STATI-10 questionnaire
  - Exit Interview

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Vital Sign Parameter Guidelines

Age	Temperature	Pulse Per min	Respirations Per min	Oximetry SpO_2	BP mmHg Systolic	BP Diastolic
Adult	98.6 +/- 1	60 to 100 Mean 75	12 to 20	90%	100 to 130	60 to 85

(Barkauskas, Baumann, & Darling-Fisher, 2002; Harkreader & Hogan, 2004))

Pulse Rate & Blood Pressure

- Any readings that were outside the safe range were outside of that range prior to the use of the WB, demonstrating that the weighted blanket was not the cause of pulse and blood pressure readings falling outside of the safe ranges.

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Pulse Oximetry

- Only the data for 20 participants could be used for pulse oximetry due to problems with the monitor staying secured
- All 20 stayed within the safe range

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Exploring Safety: Study #1

- **Question #1:** *Is the use of the 30 lb. weighted blanket safe to use with this population?*

- For *this* group of adults:
  - Yes, it can be demonstrated that for the **3 *vital sign measures*** used it appeared safe to use with this population
    - Blood pressure - n=30
    - Pulse oximetry - n=30
    - Pulse rate - n=20

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Exploring Effectiveness: Study #1

- **Question #2:** Is the use of the 30 lb. weighted blanket effective?
  - Skin Conductance Results (Quantitative): 33% demonstrated a lowering of skin conductance when using the 30 lb. weighted blanket in the lying down position for 5 minutes
  - Possible variables
    - Too calm for the GSR to register?
    - Is the GSR a sensitive enough measure?
    - Is 30 lbs too *heavy* for some or too *hot*?
    - Uncontrollable variables (e.g., thoughts of the participants, etc.)

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Exploring Effectiveness STAI-10 Results: Study #1

State Trait Anxiety Index - 10 (STAI-10)

- 63% reported less anxiety symptoms after using the 30 lb. weighted blanket
  - 19 participant's *anxiety ratings decreased* with the use of the weighted blanket
  - 8 participants experienced *no change*
  - 3 reported *higher anxiety* with the blanket than without

Note: this reflects different effectiveness results than the skin conductance measure

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Exploring Effectiveness Exit Survey: Study #1

- For the exit survey data all 32 participants responses were included

- "When did you feel more relaxed, when using the blanket or when not using the blanket?"
  - 78% reported that they felt more relaxed with the blanket than without the blanket.

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Exit Survey: Study #1

- Pressure Preferences & Body Weight (n=32)
  - Body weight does not appear to factor into amount of weight preference

Pressure of the 30 lb. Weighted Blanket	Number of Responses	Body Weight Ranges
"Not enough"	5	112 -234 lbs.
"Good"	26	114 – 206 lbs.
"Too much"	1	174 lbs.

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Exit Survey: Study #1

- Weighted Blanket Quality Preferences (n=32)
  - Each participant ranked each of the following WB qualities independently of the others

Weighted Blanket Qualities Participant's Rankings	**Very Effective (1)**	**2**	**3**	**4**	**Very Ineffective (5)**
Warmth (Temperature)	12	15	3	1	1
Weight (Deep pressure)	13	15	2	2	0
Feeling of the fabric (Tactile)	11	11	7	2	1
Voluntarily used (Not forced upon you)	10	13	7	1	1

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Weighted Blanket Study #1
Results Summary

- The use of the 30 lb weighted blanket with this non-acute and non-hospitalized adult population was within safe ranges for the 3 vital sign metrics used.
- Using SC as an anxiety metric, 33% of the participants were found to exhibit a greater reduction in skin conductance with the 30 lb. weighted blanket than without the blanket.
- The lying down position demonstrated a decrease in skin conductance for all participants

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Study #1: Results Continued

- According to the STAI-10 questionnaires 63% of participants rated their anxiety lower with the 30 lb. blanket
- 78% of the participants in the exit survey found the use of the 30 lb. weighted blanket helped to reduce perceived levels of anxiety.
- All additional exit survey comments (10) were positive about the weighted blanket.
- The manuscript for this study has been accepted for publication by: *Occupational Therapy in Mental Health* for publication in January 2008.

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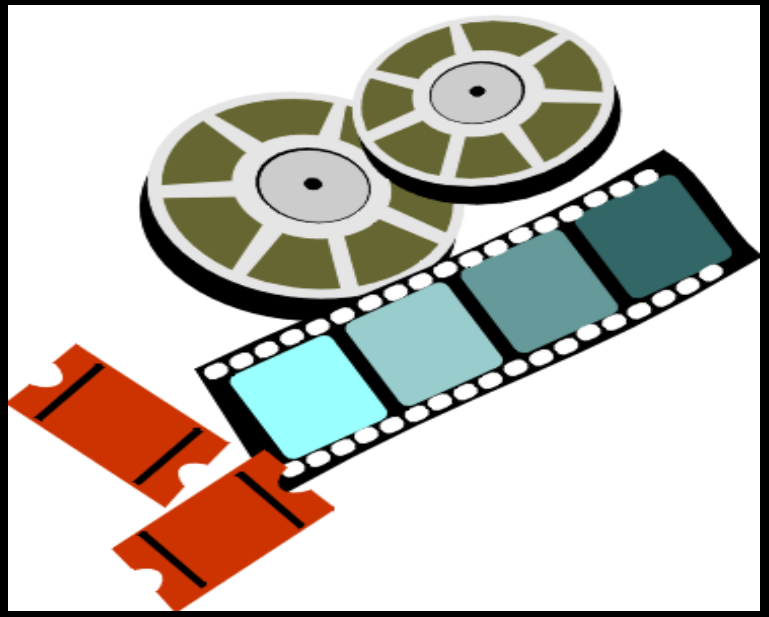
Sampling of Preliminary Findings Weighted Blanket Studies 2 & 3 Conducted at Cooley Dickinson Hospital



Sneak Preview Only

****Note: not all data is included***

Weighted Blanket Study #2 Cooley Dickinson Hospital

- Experimental Design & Methodology

- Cooley Dickinson Hospital, Northampton, Ma.
  - Tina Champagne, OTR/L - Principle Investigator
  - Debra Dickson, APRN - Co-investigator
  - Alison Berryman, M.Ed, OTR/L - assistant
  - Marie Chalifour, BS, OTR/L - assistant

- UMASS, Amherst, Ma.
  - Brian Mullen, MS - Data analysis & Technical Support
  - Professor Sundar Krishnamurty, Ph. D - Data analysis
  - Professor Michael Royer, Ph. D - Data Analysis

Weighted Blanket Study: CDH Study #2

- Repeated study #1 on Cooley Dickinson Hospital's acute inpatient behavioral health unit
  - Day one: completed informed consent
  - Day two completed phase one: monitoring phase with the full 30 lbs. as completed in study #1 at UMass
    - *Added a second phase (day 3 through the remainder of the admission) allowing the consumer to chose a self-determined amount of weight to use over the course of the admission*
- Additional changes made
  - Population & setting specific
  - Collection of demographics, Adolescent/Adult Sensory Profile, monitored whether restraints were used with participants
  - Exit survey enhanced and used at the end of phase 2 in order to obtain more consumer preference information

Study #2 Criteria

- Inclusion Criteria:
- Population: A purposeful (volunteer) adult sample of 30 participants for each phase
  - Ages 18-64; actual age range was 18-54
  - 8 Males & 22 Females
  - Allen Cognitive Level of 4.8 or higher
  - Must demonstrate safe behavior over first 24 hours of admission
  - Must be able to demonstrate an understanding of the consent document & the ability to sign the consent agreement

- Exclusion Criteria
  - Positive pregnancy test upon admission
  - Having broken bones or open wounds
  - Illiteracy

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Exploring Safety Results: Study #2

- Vital Sign metrics used: pulse oximetry, blood pressure, and pulse rate
- Pulse oximetry results: n=30, all were above 90%
- Blood Pressure (BP): majority were in the safe range both with and without the blanket. Those not in the safe range demonstrated this pattern both with and without the use of the blanket, indicating that the blanket was not the cause of the BP deviation
- Pulse: results indicate the same results as for BP

- Conclusion: The weighted blanket is safe to use given the vital signs obtained with this population

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Exploring Effectiveness Results: Study #2

- Effectiveness data reveal 43% had a significant reduction in skin conductance with the 30 lb. weighted blanket compared to without the blanket.
- STAI-10 results reveal 51% reported a reduction in anxiety after using the 30 lb. WB than when not using the 30 lb. weighted blanket.
- 77% reported a preference for the weighted blanket when using a *self-determined amount of weight.*

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Effectiveness Results: Study #2 Exit Survey

- What do you typically like using?
  - Heavy blanket: 23
  - Light weight blanket: 6
  - No blanket: 1
- How did the amount of weight feel?
  - Not enough: 1
  - Good: 23
  - Too much: 6
- When did you feel the most relaxed?
  - When using the WB: 77% (23)
  - When not using the WB: 23% (7)

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Effectiveness Results: Study #2 Exit Survey

- Self-preferred amount of weight used in phase two (from day 3 - over the remainder of the admission)
  - 5 lbs. - 3
  - 10 lbs. - 1
  - 15 lbs. - 6
  - 20 lbs. - 10
  - 25 lbs. - 3
  - 30 lbs. - 7
- Preferred fabric?
  - Cotton - 5
  - Fleece - 25

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Effectiveness Results: Study #2 Exit Survey

When did you use the WB?

- Throughout the night: 26
- During the day: 10
- Other comments: (only 2)
  - "Most of the night but took off when too hot sometimes"
  - "While lying in bed"

Exit Survey: Study #2

- When using the WB how did you feel?
  (1=Very Relaxed - 5=Very Unrelaxed)

  - 1 (Very Relaxed) - 14
  - 2 - 9
  - 3 - 3
  - 4 - 3
  - 5 (Very Unrelaxed) - 1

Exit Survey: Study #2 WB Qualities

Quality	1 = Very Effective	2	3	4	5= Very Ineffective
Warmth (Temp.)	17	7	1	2	3
Weight (Pressure)	11	10	3	5	1
Feeling of the fabric (Tactile)	11	14	2	2	1
Voluntarily used (not forced upon you)	21	6	2	1	0

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Exit Survey: Study #2

- What did you like the most about the weighted blanket (WB)?
  - "The weight"/"pressure" - 8
  - "The warmth" – 5
  - "It is comforting" - 5
  - "Made me feel secure"/"Felt secure" – 4
  - "Felt like a hug"/"Felt like someone was holding me" -2
  - "Calming" – 2
  - "Relaxing" - 2
  - "The Feel of the fabric" - 2
  - "It made me sleep better/kept me in a deep sleep"- 2
  - "Felt less back pain after sleeping" - 1
  - "The way it conformed to my body, especially my lower body"- 1
  - "That the amount of weight can be changed"- 1
  - "It lowered my anxiety" - 1
  - "That the fabric was bright and colorful" - 1
  - "The weight felt like my cat on my legs" - 1
  - "I love the weighted blanket"- 1
  - "That it wasn't forced" - 1

Exit Survey: Study #2

When was the WB the most helpful?

- "At night" – 6
- "When sleeping" – 4
- "When anxious"/"when feeling jittery" – 3
- "When taking a nap in the afternoon" – 2
- "Wrapping in it when I was scared"/"When scared" – 2
- "When first going to bed"/"Just before falling asleep" – 2
- "When I needed to calm down" – 1
- "When not feeling relaxed" – 1
- "When I was stressed out at night" – 1
- "Late night when my mind is usually racing" – 1
- "Helped me sleep through the night" – 1
- "When lying down" – 1
- "The benefits seemed highest after waking up" – 1
- "During the first ten minutes of use" – 1
- "During the day" – 1
- "When I first got into bed and was cold" – 1
- "When I was lost" – 1
- "When I felt insomnia it soothed me to sleep" – 1
- "When I was upset" - 1

Exit Survey: Study #2

- When using the WB how did you feel?
  - "More relaxed"/"Relaxed" – 11
  - "Secure" – 8
  - "Comfortable" – 5
  - "Safe" – 4
  - "Good" – 4
  - "Comfort"/"Comforted" – 3
  - "Calm"/"Calmed me down" – 3
  - "Too hot"/"Too warm" – 3
  - "Warm" – 3
  - "A little Claustrophobic after a few hours of using it"/"Trapped" – 2
  - "Cozy" – 1
  - "Sleepy" – 1
  - " Like someone was holding me down" – 1
  - "Calm but only when there was a little weight" (5 lbs. vs. 30 lbs.) - 1

Exit Survey: Study #2

- What did you like the least about the WB?
  - "Too hot at times" - 8
  - "Too heavy"/"Too much weight at times"/"Too heavy over time" – 6
  - "Nothing" - 5
  - "That I have to leave it here"/"That it isn't mine"- 3
  - "It shifted off the bed" - 2
  - "Would prefer the weights to be more evenly distributed" - 2
  - "It carried a lot of static"- 1
  - "The fleece" - 1
  - "I liked it" - 1
  - "30 lbs. was too much but 15 lbs. was perfect" – 1
  - "Difficult to make my bed" (heaviness) - 1

Results Continued: Study #2

- None of the study participants required the use of restraint or seclusion throughout the admission.
- Several participants had a history of restraint during previous admissions.

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CDH Study #3 Snapshot!
Exit Survey Sneak Peak Only

Study recently completed: Data Analysis in progress

Weighted Blanket Study #3

- Conducted at: Cooley Dickinson Hospital's
  Acute Inpatient Behavioral Health Unit
  Northampton, MA

- Same inclusion & exclusion criteria with the following revisions:
  - Purposeful (volunteer) adult sample of 33 participants
  - Actual age range for this study was 19- 57
  - 10 males & 23 females
  - Excluded participants from CDH study #1
  - Used self-preferred amount of weight for both phases
  - Added Temperature Sensor
  - Added Temperature as another vital signs (safety) metric
  - Added a second exit survey

Exit Survey: Study #3

- What do you typically like using?
  - Heavy blanket: 24
  - Light weight blanket: 9
  - No blanket: 0
- How did the amount of weight feel?
  - Not enough: 1
  - Good: 29
  - Too much: 3
- When did you feel the most relaxed?
  - When using the WB: 91% (30)
  - When not using the WB: 9% (3)

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Exit Survey Results: Study #3

- Self-preferred amount of weight used over the admission
  - 5 lbs. - 1
  - 10 lbs. - 1
  - 15 lbs. - 2
  - 20 lbs. - 7
  - 25 lbs. - 5
  - 30 lbs. - 17
- Preferred fabric?
  - Cotton - 15
  - Fleece - 18

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Exit Survey: Study #3

When did you use the WB?

- Throughout the night: 31
- During the day: 14
- Other comments:
  - "When lying down between groups, reading, etc."
  - "Whenever I wanted to sleep"
  - "During the day in bed"
  - "When anxious, overwhelmed"
  - "Nights - until I became warm"
  - "If I had one at home I would like to snuggle in it in the winter and watch TV"

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Exit Survey: Study #3

- When using the WB how did you feel?
  (1=Very Relaxed - 5=Very Unrelaxed)

  - 1 (Very Relaxed) - 15
  - 2- 12
  - 3- 5
  - 4 - 1
  - 5 (Very Unrelaxed) - 0

Exit Survey: Study #3
WB Qualities

Quality	1 = Very Effective	2	3	4	5= Very Ineffective
Warmth (Temp.)	19	11	2	1	0
Weight (Pressure)	15	12	5	1	0
Feeling of the fabric (Tactile)	15	12	5	1	0
Voluntarily used (not forced upon you)	26	4	3	0	0

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Exit Survey: Study #3

- What did you like the most about the WB?
  - "Weight/pressure" - 12
  - "Warmth/Kept me warm" - 7
  - "Made me feel safe/secure" - 7
  - "Feel of the fabric/The fabric" - 4
  - "Like someone was hugging me/like a big hug" -2
  - "It was comforting" - 2
  - "Very relaxing/It relaxed me" - 2
  - "Helped me fall asleep" - 1
  - "Helped me sleep" - 1
  - "Calm and cuddly" - 1
  - "To be able to change the amount of weight" - 1
  - "The size" - 1
  - "It was comfortable" - 1

Exit Survey: Study #3

- What did you like the least about the WB?
  - "Nothing/N/A" - 8
  - "Hot/Too warm/A little warm" - 7
  - "The weight/heavy" - 4
  - "Hard to move when sleeping/movement difficult but tolerable/hard to move around" - 3
  - "Hard to make my bed" - 2
  - "Weights not evenly distributed throughout the blanket" - 1
  - "Weights became uneven at one point" - 1
  - "The color" - 1
  - "The size" - 1
  - "Tactile - but I still liked it" - 1
  - "It would fall off to one side if I moved a lot" - 1
  - "When it fell on the floor it was hard to pick up" - 1
  - "Sometimes it made me feel claustrophobic until it was adjusted to 15 lbs." - 1

Exit Survey: Study #3

When was the use of the WB the most helpful?

- "When trying to fall asleep/fell asleep faster/seemed to speed up the process of falling asleep" - 9
- "At night/nighttime" - 7
- "When I was cold" - 3
- "When lying under it /when it as on me" - 2
- "When feeling lonely" - 2
- "After having a nightmare" - 1
- "Nap time" - 1
- "When sleeping" - 1
- "Early morning" - 1
- "Bed time" - 1
- "All of the time" - 1"When insecure" - 1
- "When anxious" - 1
- "When feeling sad" - 1
- "When feeling suicidal" - 1
- "When feeling upset" - 1
- "When feeling stressed" - 1
- "When I needed comfort and grounding" - 1

Exit Survey: Study #3

- When using the WB how did you feel?
  - "More relaxed/relaxed" - 10
  - "Secure" - 8
  - "Safe" - 7
  - "Comfortable' - 5
  - "Comforted" - 3
  - "Calm" - 3
  - "Warm" - 3
  - "Overall very well/fine/all right" - 3
  - "Content' - 1
  - "Better' - 1
  - "Felt like someone was next to me" - 1
  - "Because of the lack of physical contact the blanket became a helpful alternative" - 1
  - "Like my mom who passed away was hugging me" - 1
  - "Not comfortable" - 1

Results Continued: Study #3

- None of the study participants required the use of restraint or seclusion
- Several participants had a history of restraint during previous admissions.

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Common Themes

- SAFETY: All 3 Studies show that the weighted blanket (WB) is safe to use in the adult population for the vital signs measures used
- STAI-10 for study 1 & 2 both showed a decrease in anxiety. Study 3 data not yet analyzed
- WB Qualities for all 3 studies were primarily rated effective to very effective
  - Consumers at CDH rated the fact that it is self-controlled as the most effective quality in both CDH studies
- WB was warm, comforting, relaxing, and calming to many of the participants
- SLEEP: For many participants, sleep had a positive impact when using a self-determined amount of weight
- Amount of weight preferred: body weight is generally not a factor influencing the amount of weight preferred.

Exit Survey Comparisons CDH Studies: 2 & 3

- What did you like the most about WB?
  - Weight - 20
  - Warmth - 12
  - Comforting - 7
  - Feel of fabric - 6
  - Relaxing - 4
  - Calming - 3
  - Able to sleep - 3
- What did you like the least about WB?
  - Too hot - 15
  - Too heavy - 10
- When was the WB the most helpful?
  - At night - 13
  - When sleeping - 5
  - When anxious - 4
  - When lying down - 3
  - When napping - 3
  - When stressed - 2
  - When upset -2
- When using the WB how did you feel?
  - Relaxed - 21
  - Secure - 16
  - Comfortable - 10
  - Safe - 11
  - Calm - 6
  - Warm - 6

Fabric Preferences

Cotton:

- CDH study #2: 5
- CDH study #3: 15
  - *TOTAL: 20 preferred cotton*

Fleece:

- CDH study #2: 25
- CDH study #3: 18
  - *TOTAL: 43 preferred fleece*

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Self-preferred Amount of Weight

- CDH study #2:
  - 5 lbs. - 3
  - 10 lbs. - 1
  - 15 lbs. - 6
  - 20 lbs. - 10
  - 25 lbs. - 3
  - 30 lbs. - 7
- CDH study #3:
  - 5 lbs. - 1
  - 10 lbs. - 1
  - 15 lbs. - 2
  - 20 lbs. - 7
  - 25 lbs. - 5
  - 30 lbs. - 17
- TOTALS:
  - **Studies #2 & #3:**
    - **5 lbs. - 4**
    - **10 lbs. - 2**
    - **15 lbs. - 8**
    - **20 lbs. - 17**
    - **25 lbs. - 8**
    - **30 lbs. - 24**

Preliminary Guidelines

- The weighted blanket is NEVER to be used as a restraint
- Review each person's medical and trauma history
  - Do they have any medical considerations that would effect utilizing the weighted blanket?
  - Does the person have any trauma considerations that would effect utilizing the weighted blanket?
  - Do they have a tendency to feel claustrophobic?
- Explore weight and fabric preferences with the person

Preliminary Guidelines: Continued

- Have the person try using the blanket overnight
  - Remind the person that they can remove the blanket if it ever feels too heavy or too hot
- When trialing the blanket overnight, follow-up with the person the next day
  - Did the blanket have enough weight or too was it too much?
  - Ask the person if they want to make any changes in the amount of weight they are using, weight placement, and find out why they are requesting these changes.

Preliminary Guidelines: Continued

- Assist consumers in self-rating influence of use both in the moment and over time
- If there are any concerns or changes in preferences at any time, customize the blanket to the person's needs
- User preferences must be documented, placed in a central location for staff and consumer to refer to, and reviewed in treatment team
- Never put or allow a consumer to put the weighted blanket over their head
- Obtain medical clearance or a physician's order when there are any safety concerns

Future Directions

- Continued Collaboration with the UMass School of Mechanical Engineering
  - To assist in the design, creation and research of weighted blanket prototypes based on staff and consumer preferences
  - Creation of an optimized pressure vest
  - Researching the safety and effectiveness of the weighted blanket & pressure vest prototypes
  - Comparison studies: the weighted vest to the pressure vest; the weighted blanket prototypes to those currently on the market

Optimized Pressure Vest Prototype

UMass Amherst, School of Mechanical Engineering

Additional design assistance by Joe Patterson & Marc Santos
UMass Amherst, Mechanical Engineering undergraduate students

Future Directions

- Collaboration with Dr. Ivelisse Lazzarini at Creighton University
  - Exploring EEG as an effectiveness metric
  - Exploring a nonlinear dynamic theoretical model
  - Exploring nonlinear dynamic approaches to research
  - Collaboration on the research and development of weighted blanket prototypes based on faculty, student, staff & consumer preferences

Resources

For more information visit: www.ot-innovations.com

The *Weighted Blanket Book* by Walker & McCormack

Weighted blanket vendor examples:

- Weighted Wearables: www.weightedwearables.com
- Quiet Quilt: www.quietquilt.com
- Dream Catchers: www.weightedblanket.net
- Salt of the Earth: www.saltoftheearthweightedgear.com
- Calm Comforts: www.calmcomforts.com
- Abilitations: www.abilitations.com
- Southpaw: www.southpawenterprises.com