



# Unique Considerations for Women with Extremity Trauma and Amputation

*State of the Science Symposium  
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# Women and the Need for Strategy

*“We, at VA, must be visionary and agile enough to anticipate and adjust not only to the coming increase in women Veterans, but also to the accompanying complexity and longevity of treatment needs they will bring with them.”*



Secretary Shinseki, July 16, 2011  
Department of Veterans Affairs  
National Training Summit on  
Women Veterans

# Women in Combat



Improved Quick Release System

Narrower Shoulders

Front Ballistic Plate Insertion

Additional Cummerbund Adjustability

Yoke and Collar Assembly designed for compatibility with a hair bun

Darting for more secure fit

Shorter Length to better fit female torso



# Scope of Traumatic Extremity Injuries 2003-Feb 2013 (DoD Trauma Registry)

Military Operation	OEF	OIF	OND	Total
<b>Battle</b>	4700	7823	58	12,581
Male	4643	7656	56	98%
Female	57	167	2	2%
<b>Non-Battle</b>	1883	4407	284	6574
Male	1802	4124	226	94%
Female	81	283	13	6%
<b>Total</b>	6590	12265	284	19,139 (3.2%)

# Population of Women with Amputation

- **35% of 1.6 Million Amputees** (all causes) **in US in 2005 were Female** (*Ziegler-Graham et al*)
- **45% of Amputations Result of Trauma** (704K) ; **19% Females** (133K) (*Ziegler-Graham et al*)
- **1, 598 Service Members with Traumatic Amputations; 25 Females (1.6%)** (1 May 2013)
  - 20 Female Single Limb Amputees
    - 17 Lower Limb
    - 3 Upper Limb
  - 5 Female Multiple Limb Amputees
    - 4 Bilateral Lower Limb
    - 1 Bilateral Upper Limb



# Females with Extremity Trauma & Amputation Receiving Care in VA

## *Women Account for:*

- 2% (1,922) of the 90,000 Veteran Amputees resulting from all causes
- 2.2% of the 20,570 Veteran Amputees receiving care in VHA in FY 2013
- 4.3% (9) of the 205 OEF/OIF/OND amputees receiving limbs in FY 2012
- 4% (\$314K) of the \$7.7M spent on artificial limbs in FY 2012
- 7.2% (\$9.3M) of the \$129M spent on orthoses in FY 2012



## Unique Considerations...Utilization of Services

- “Veterans with amputations are significant users of all VA healthcare services (not just Prosthetic Services). VA should pay special attention to coordinating services that provide *comprehensive interdisciplinary* care for amputees to meet their *multiple needs*.” (VA OIG, January 2012)
- Veterans with amputations and extremity trauma require integrated care across many programs (e.g., Patient Aligned Care Teams; Orthopedics; Surgery; PM&R; Pain Management; Mental Health; Prosthetic Services; Social Work Care Management).
- Lifetime female health care expenses a third higher than male expenses (Alemayehu & Warner 2004)
- **In VHA, female amputees are seen more frequently than male amputees in Rehab Services** ( VHA Rehabilitation & Prosthetic Services)

# Unique Considerations.....Social Support

- **Greater risk as women Veterans for concomitant issues of PTSD and Military Sexual Trauma** (*VA Center for Women Veterans*)
- **Greater risk as women Veterans for homelessness** (National Center on Homelessness among Veterans ,2010 Report to Congress)
- **Greater risk as female Veterans** (Briefing by Bureau of Labor Statistics March 2012) **and amputees for unemployment** (*Hebert & Ashworth 2006*)
- **Female Amputees are more likely to live alone** (Singh et al)



## Unique Considerations.....Physical

- Age, cause, and level of amputation impact functional outcomes; **no gender differences in function of lower limb amputees** (Frlan-Vrgoc *et al*, 2011)
- **Both women and lower extremity amputees at significant risk for osteoarthritis** of the hip and knee; risk for knee OA in women increased by approximately 15% for each additional kg/m<sup>2</sup> (*Struyf, et al; Sowers 2001*)
- **Female lower extremity amputees demonstrate significantly lower BMD values than male counterparts** (*Smith et al, 2011*); **traumatic amputees have lower BMD than non-traumatic** (*Leclercq et al, 2003*)
- **Lower-Limb Female Amputees report more skin problems than male counterparts** (*Meulenbelt et al*)

# Pain & Psychological Functioning (*Hirsh et al 2010*)

- More men report Phantom Limb Pain (PLP) but not significant when controlled for cause
- No differences in presence or intensity of Residual Limb Pain (RLP) or in intensity of PLP
- **Female Amputees significant for greater overall pain intensity**
- **Female Amputees significant for Pain Interference (Modified Brief Pain Inventory Interference Scale)**
- No significance in psychological functioning (SF-36 MH)

# Pain & Psychological Functioning

- **Females significant for greater pain catastrophizing (CSQ-CAT) and use of coping self statements**
- Females, though not significant, reported greater coping strategies related to resting, relaxation, and social support
- **Females significantly more likely to endorse beliefs related to personal control over pain, appropriateness of solicitous responses from others; slightly more likely to endorse appropriateness of use of pain medications**

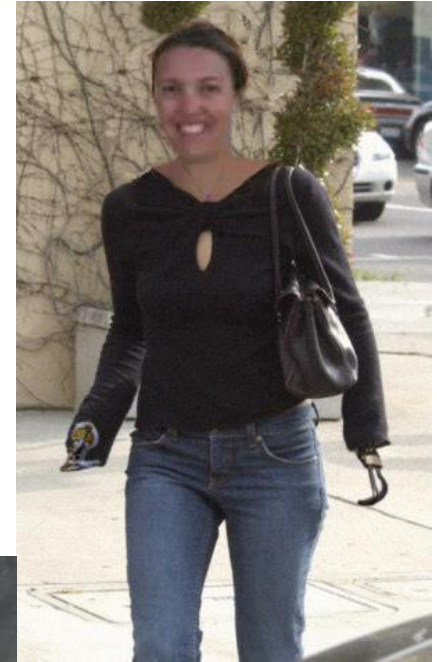
# Prosthetic Use & Satisfaction

- **Female amputees less likely to be successfully fit with prosthesis (Singh)**
- **Female Amputees higher satisfaction with their prosthetist; less likely to be satisfied with prosthesis fit and appearance (Pezzin et al)**
- **Females with Upper-Limb Amputation are more likely to reject the prosthesis (*Biddis & Chau; Ostlie et al*)**



# Improved UL Technology - More Individual Choice

- Gen 3 DEKA Arm



# Advances in Lower Limb Technology/Seating



# 3-D Technology



# Pregnancy and Women with Limb Loss

- Weight management and regular exercise important – amputees may be impacted early in pregnancy
- Transfemoral amputees most affected due to larger amount of soft tissue present
- Modifications will vary depending on the socket and suspension
- Alignment, abnormal wear of components should be checked regularly
- Above-Knee amputees having a C-Section should have incision made higher to prevent irritation by socket brim.





# Clinical & Environmental Factors

- Providers may need to provide enhanced communication to maximize encounter satisfaction
- Females report a greater need for privacy, modesty, and sense of dignity during evaluation process
- Females often prefer a female prosthetist/orthotist
- Females describe different rehabilitation goals –  
“not everyone wants to return to running”
- Should strive to have female peer visitors  
“men don’t see this the same way women do”



# Unique Considerations.... Psychosocial Adjustment

- **Most studies have found no association between sociodemographic factors and adjustment to limb loss, but those who have, found males have better outcomes than females (Horan & MacLachlan)**
  - Body Image Anxiety
  - Social Functioning & Discomfort “disabled”
  - Female Amputees have less sexual problems than males (*Geertzen et al*)
- **Several factors impact psychosocial adjustment:**
  - Personality – risk taker & extrovert associated with better social integration
  - Optimism
  - Social & family support
  - Positive Meaning
  - Participation in sports/physical activities



# Female Service Member Amputee Experience (Carter 2012)

## **Phenomenological Study of 6 Female US Service Members with traumatic amputations:**

- *“please tell me a little bit about your background and how you came to join the military”*
- *“In what ways, if any, has being injured changed your life?”*
- *“If you were to walk into a hospital today as a peer visitor to visit a Servicewomen who had just lost a limb, what would you tell her?”*
- **Three major themes emerged:**
  - Physical Disability Adjustment Issues – Pain, Loss of function
  - Psychosocial Adjustment & Coping Skills – Body Image, Personal safety fears, grief and loss, and coping with attitudes of others
  - Protective Factors – Positive Attitude, social support, military culture, sense of humor, recognition it could have been worse, making meaning

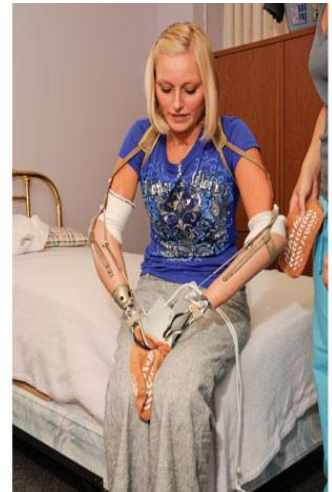
# Female Service Member Experience

- Physical Disability & Adjustment
  - Sweating, phantom pain, are a part of life – would not let it limit activity
  - Lower limb wore prostheses, upper limb had abandoned
  - Level of complexity increases dramatically for each joint you are missing
- Psychosocial Adjustment and Coping Skills
  - Body image worse for upper limb- hears whispers “so ugly”
  - Losing a limb, whether arm or leg, reduces a woman’s ability to defend herself and diminishes her sense of personal safety (Companion or Service Dog)
  - Described period of mourning followed by individual personal resilience.
  - All feared their friends would abandon them & be difficult to make new ones
  - All desired to be recognized/respected as an individual and Wounded Warrior; “ask about their career before asking about their disability”
  - “Only another veteran amputee can understand my life experience”
  - Many found new meaning – “transformative experience;” “I’ve accomplished more with one leg than.....with two;” “put me on a completely different path”

# Conclusion



- Changing roles of women, both military and civilian, put females at an increased risk for traumatic extremity injury and amputation
- While fewer women than men undergo amputation, women with extremity trauma and amputation have unique needs
- Need for Prosthetic and orthotic manufacturers to develop additional female components/braces
- Clinicians should give greater consideration to custom bracing, prosthetic components/sockets, and seating systems for women
- Research on women and amputation very limited



# Questions



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