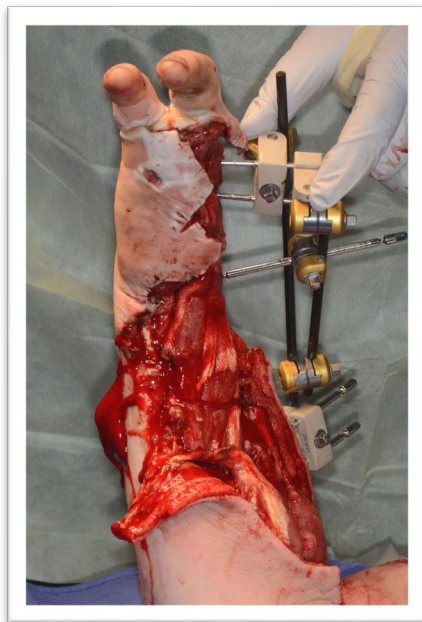


VCA AND THE MILITARY



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MANDATORY DISCLAIMER

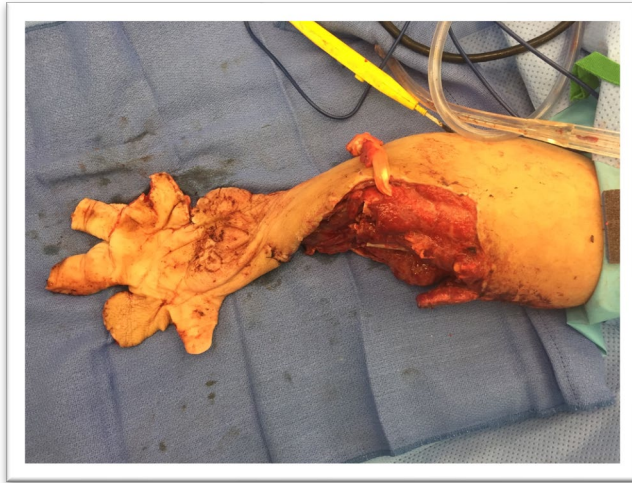
The views expressed in this presentation are those of the authors and do not necessarily reflect the official policy or position of Walter Reed National Military Medical Center, the Department of the Navy, Department of the Army, Department of Defense, nor the U.S. Government





OIF/OEF AMPUTATION

- Over 2200 major limb amputations
- 276 major upper extremity amputations
- Bilateral UE 17





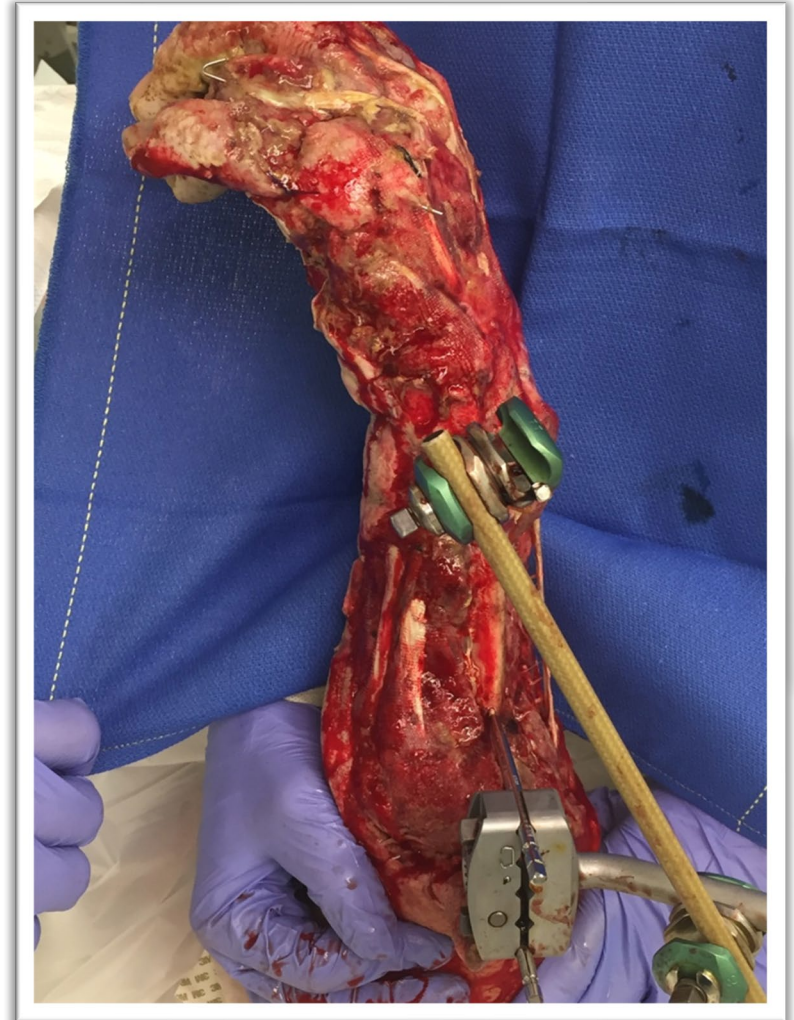
Military VCA in the World

C. A. Fries¹  · D. Tuder² · V. S. Gorantla³ · R. K. Chan⁴ · M. R. Davis⁵

- As of 2020. 9 veterans have had VCA Worldwide
- 9 of approx. 170 VCA worldwide
- HAND cases
 - 1st transplant was for an Ecuadorian marine (1964)- failed
 - 2009 USMC Corporal – unilateral transplant 2 years after being medically retired
 - 2010- Wilford Hall- unilateral hand transplant- 10 years plus with limb- medically retired before transplant
 - 2010 – Polish bilateral hand VCA at a civilian facility
 - 2012- Johns Hopkins- bilateral upper in medically retired army Master Sergeant
 - 2015- Afghan Army Captain bilateral upper transplant in Kochi, India. (2019- still in Afghan Army)
 - 2016- Brigham and Women's Hospital- USMC medically retired- bilateral upper transplant
- Other VCA
 - 2018- Johns Hopkins- Penis transplant- medically retired
 - 2015- Russa 2015- Face transplant



WHAT MAKES THEM UNIQUE?

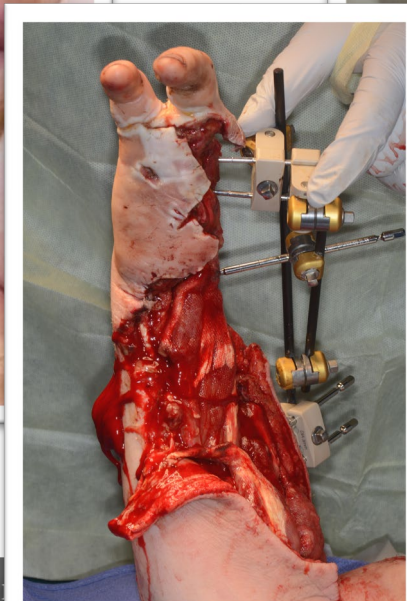
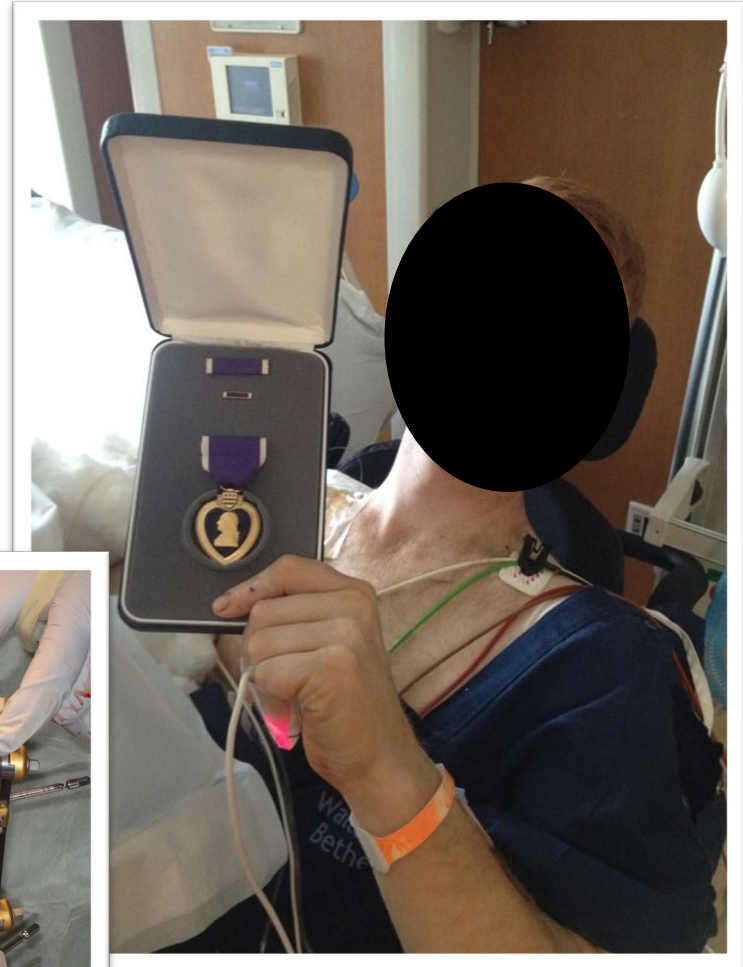




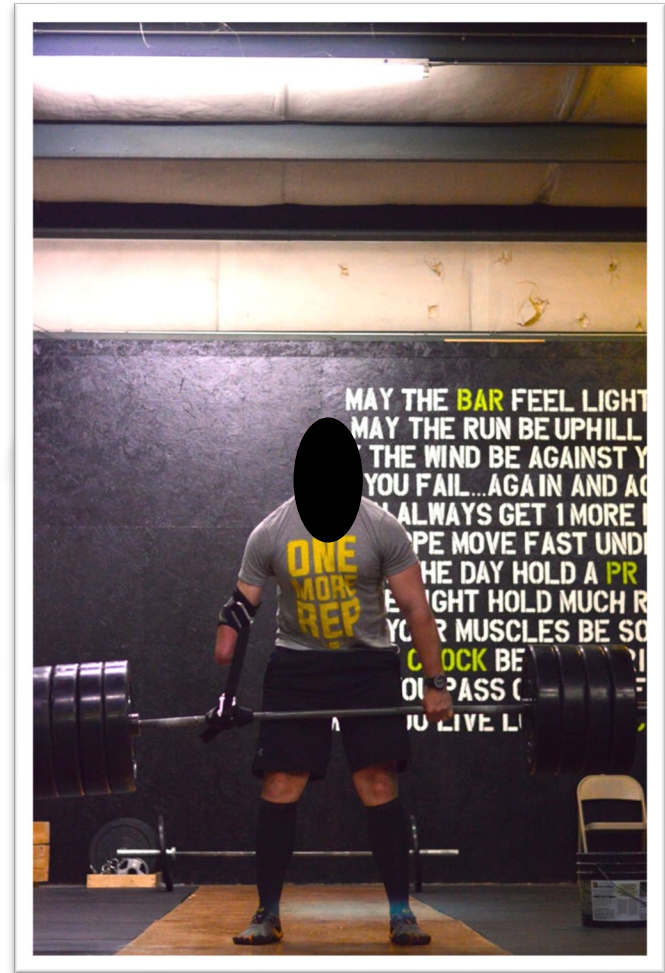
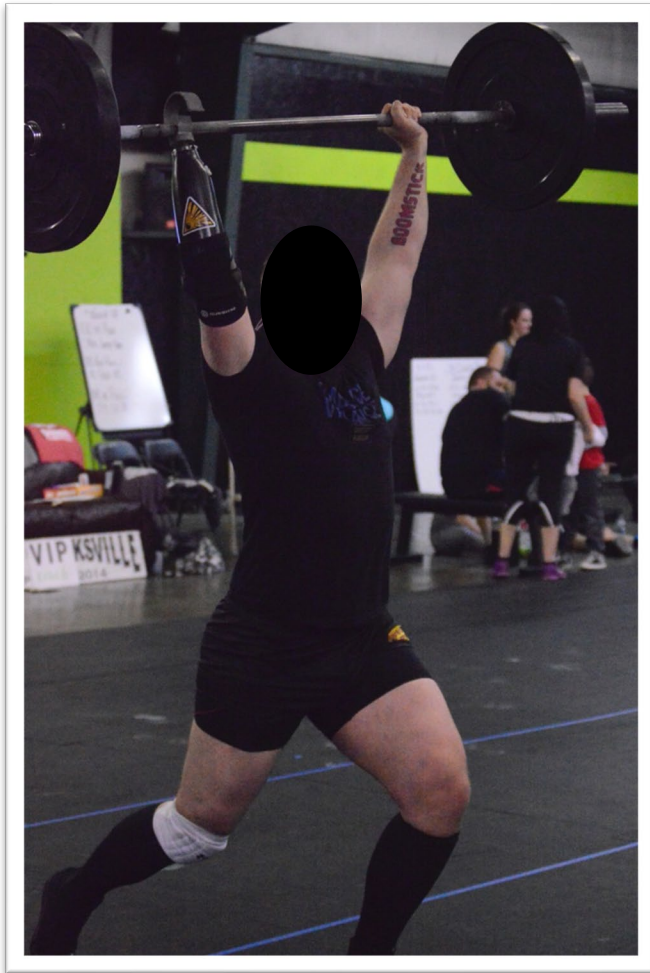


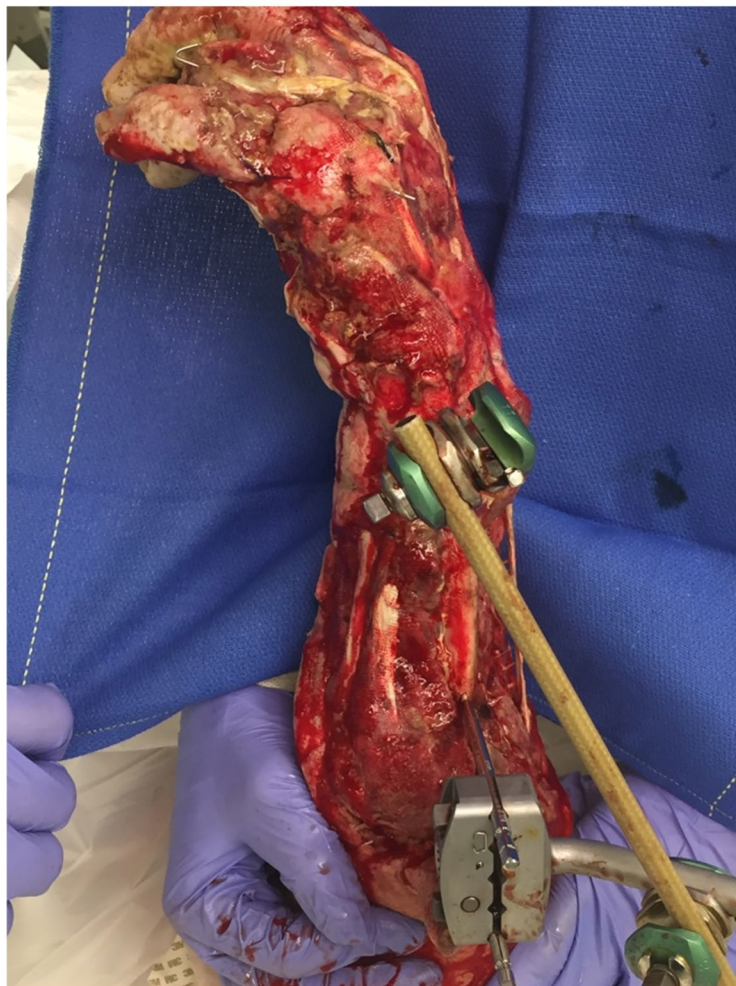
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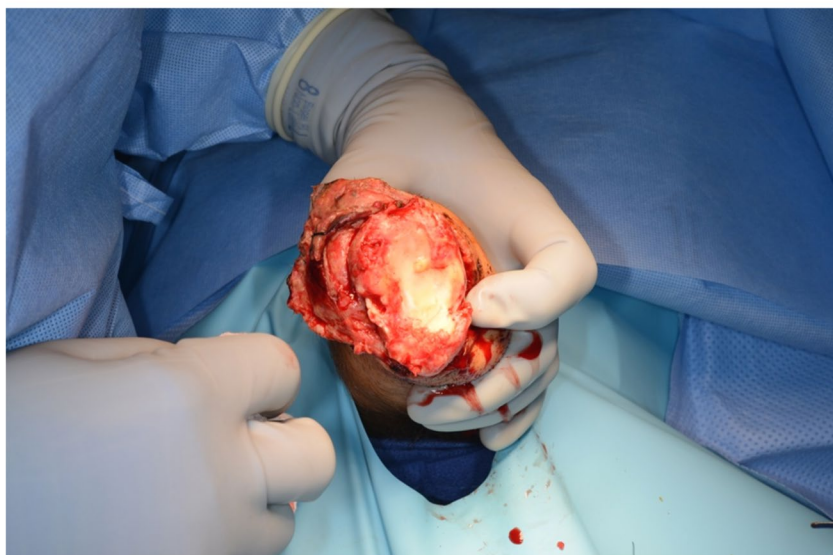
INTEREST IN VCA?

- 276 major upper extremity amputations
- Bilateral UE 17
- 2 quad amputees have received transplants
- 1 bilateral upper extremity





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WHY IS INTEREST LOW?

Starts high



<https://abcnews.go.com/Health/lindsay-ess-story-quadruple-amputee-hand-transplant-recipient/story?id=38545191>



<https://www.usatoday.com/story/news/nation-now/2017/07/19/zion-harvey/491548001/>

Wanes

Within ★ Reach

Interview with MSGT Rick Cicero- upper and lower limb Amputee from the war- perfectly Eloquent Answer 1:09 seconds.

<https://www.withinreach.info/weigh-all-options>

- 1) Medications
- 2) Organ dysfunction (kidneys/DM)
- 3) Sun exposure/lifestyle changes



IS INTEREST GROWING?

Not Really



<https://www.qlplus.org/challengers/rick-hard-j-cicero-jr-army-police>



<https://www.nbcsports.com/golf/news/after-losing-limbs-afghanistan-rick-cicero-making-difference-club-fitting>



DO ATTITUDES, OPINIONS, KNOWLEDGE OF OTHER TREATMENTS HAVE AN IMPACT ON MILITARY PERSONNEL CONSIDERING TRANSPLANT ?

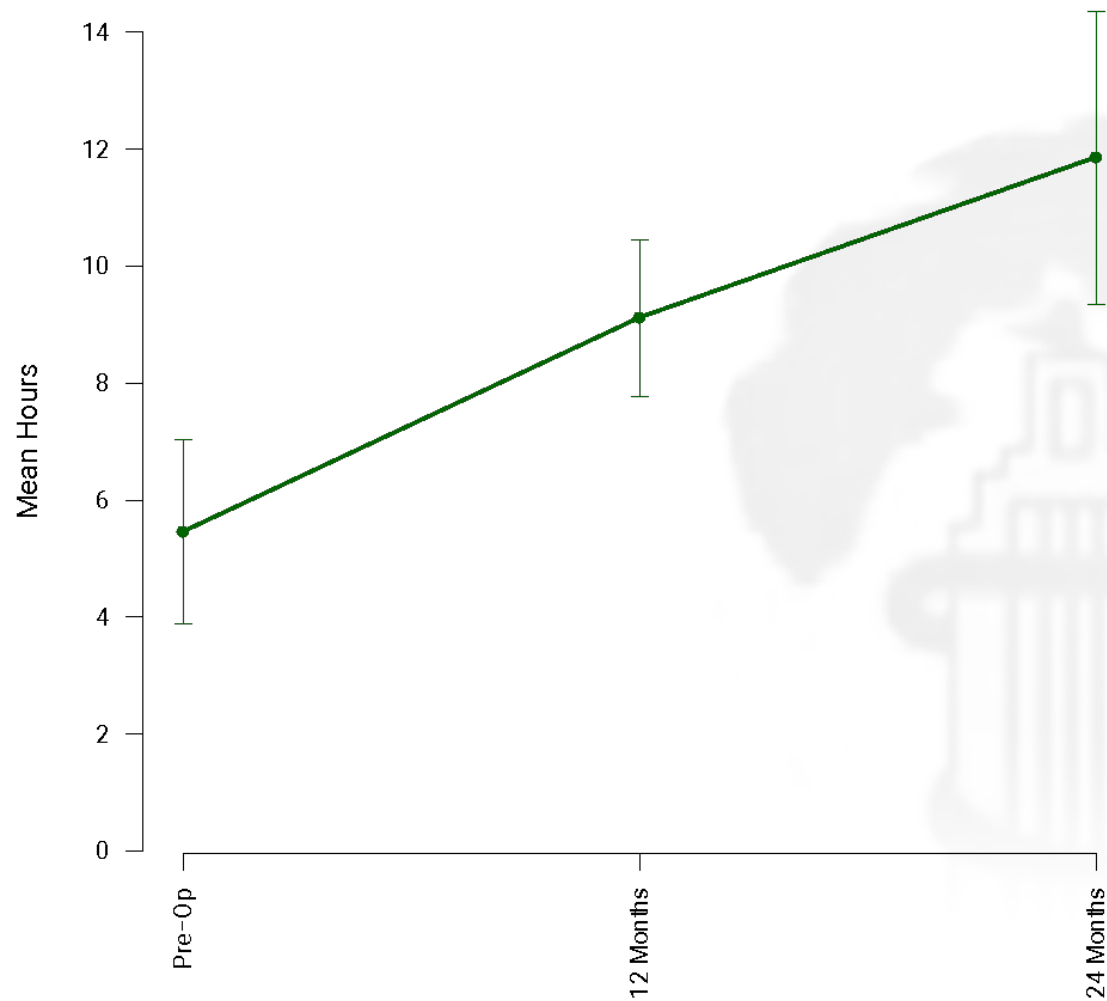


- FDA trial at Walter Reed
- 14 completed under this trial
- Numerous others under compassionate use
- Excellent outcomes

<https://twitter.com/IIOPtampa/status/1559557867983732736>



Mean Prosthetic Use in Hours per Day



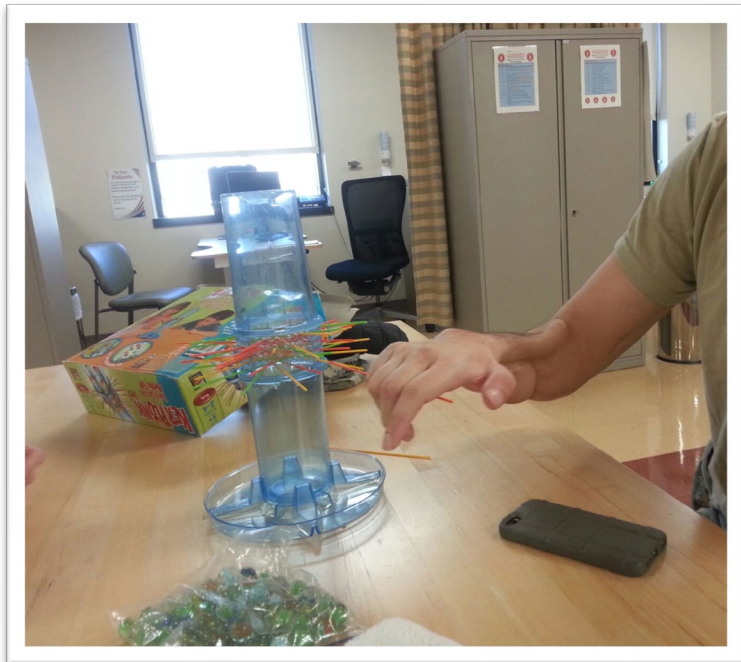


WHAT ABOUT

Standard Prosthetics



Limb Salvage





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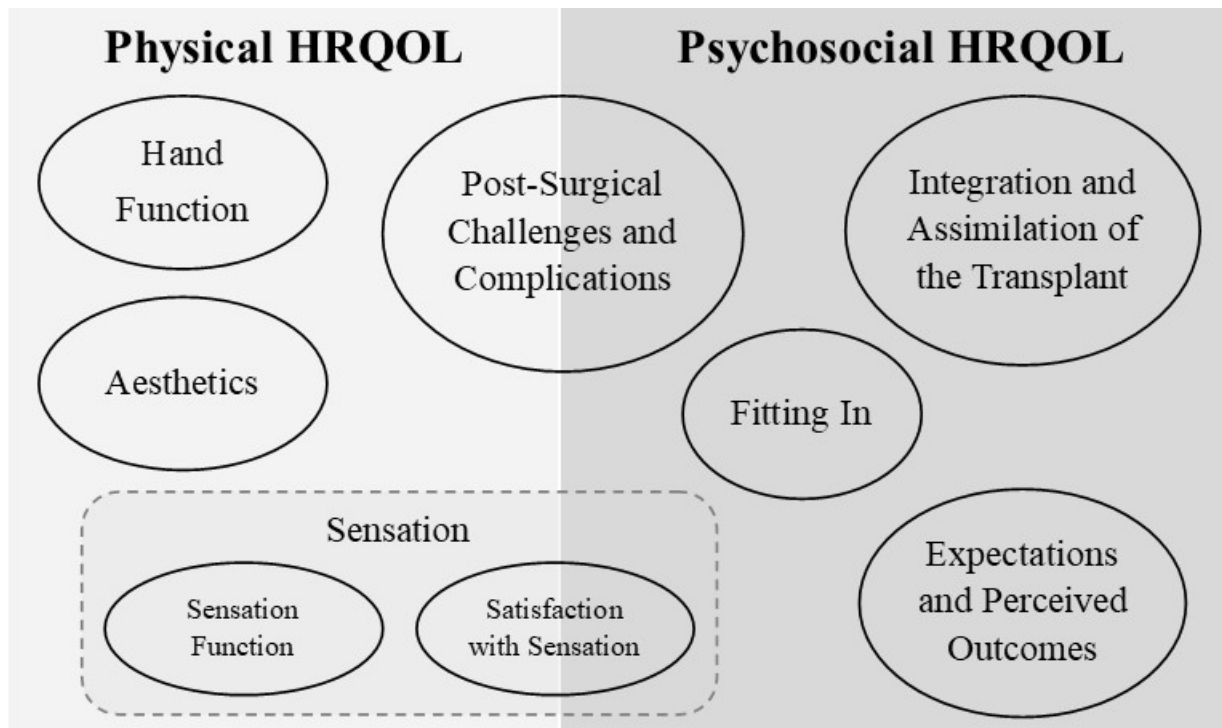
L. Scott Levin,
MD
Chair,
Department of
Orthopaedic
Surgery Paul B.
Magnuson
Professor of
Bone and Joint
Surgery



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NEW HRQOL DOMAINS FOR HT



Tyner, C., Slotkin, J., Kisala, P., Levin, L. S., Tintle, S. M., & Tulskey, D. (*in press*). Assessment of quality of life after upper extremity transplantation: Framework for patient-reported outcome scale domains. *Frontiers in Psychology*. doi:10.3389/fpsyg.2022.989593



TORCH COLLABORATION

1. **Assess the benefits of UE VCA, Limb Salvage, Osseointegration and Standard prosthetic users across emotional, social, physical, and functional domains.**
2. **Longitudinal assessment of how this changes over time.**

Hand Transplant	Limb Salvage	Osseointegration	Standard Prosthetic Users
25 pt goal	25 pt goal	25 pt goal	25 pt goal

Currently Enrolling patients – 51 % enrolled

Johns Hopkins University

University of Pennsylvania

Walter Reed National Military Medical Center

University of Louisville

University of California Los Angeles

University of Delaware

Leeds University (UK)- bringing on board now



WHAT ARE THE MAJOR CONSIDERATIONS IN THE CANDIDATE SCREENING PROCESS ?

- Manuscript in Preparation now from our TORCH Consortium- time constraints preclude in depth discussion
- 1) University of Pennsylvania/Children's Hospital of Philadelphia; 2) UCLA; 3) University of Louisville; 4) Brigham and Women's Hospital; 5) Massachusetts General Hospital; 6) Johns Hopkins University; 7) NYU Langone Health; 8) Mayo Clinic; 9) Duke University; and 10) Leeds University United Kingdom
- 9 of 10 sites participated, 8 of 10 completed
- Good consistency of Medical Contraindications to transplant
- Poor Consistency of psychological/psychiatric contraindications to transplant



ARE THERE SPECIFIC OUTCOME METRICS THAT SHOULD BE TRACKED FOLLOWING VCAS AND SHOULD THEY DIFFER BY POPULATION ?

- Prospectively collected outcomes before and after transplant longitudinally over time. Transplant outcomes will change over time. Funding for continued assessment over the next 20 years is imperative.
- LIMB QOL/HT +HRQOL domains
- Should they differ by populations- no
 - All new LIMB QOL measures provide equivalent outcomes measurement between individuals who are current or former members of the military and those without a military background. (Differential Item Functioning Analyses)
 - 288 Civilians. 315 Active Duty/Reservists



- Graft survival is inadequate. Functional metrics important but not the whole story
- We must find a way to capture the outcomes of our “failures”.



- The devastating Allure of Medical Miracles
David Dobbs

<https://www.wired.com/story/devastating-allure-of-medical-miracles/>



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DARPA-Haptix- Leverage

GRIP

Grasping Relative Index of Performance



speed-precision
relationship of a
grasper

CBI

Control Bottleneck Index



bottlenecks in
control and
feedback

GaMA

Gaze and Movement Assessment



kinematic motion
and gaze behavior
in functional tasks

PEP

Prosthesis Efficiency and Profitability



prosthetic system
efficiency and
profitability

PIC

Prosthesis Incorporation



tool incorporation
and physiological
relevance



Cleveland Clinic
Lerner Research Institute



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THANK YOU

