

Amputee Care Program: Experiences at WRAMC

LTC Paul F. Pasquina, MD

Medical Director Amputee Program

Chief, Physical Medicine & Rehabilitation



If you look at any free country in the world, chances are that some American blood was spilled for that freedom.....

Goal:

- Provide the highest quality of care to our soldiers, who are willing to put their life in harms way.



Goal:

- Provide the highest quality of care to our soldiers, who are willing to put their life in harms way.



Care: Comprehensive Short Term / Long Term

- Evacuation
- Surgical
- Medical
- Nursing
- Co morbidities
- Therapy
- Psychological
- Social support
- Pain Management
- Nutrition
- Prosthetics
- Education
- Equipment
- Community reintegration
- Vocational rehabilitation
- Return to duty

Highest Quality

- Expert Opinions
 - Education
 - Physician
 - Nursing
 - Therapist
 - Prosthetist
 - Patients
 - Family members
 - Resources
 - Research
- Teamwork
Multidisciplinary
 - Cooperation
Multiple MTFs
 - Partnership
DoD  VA

Overview

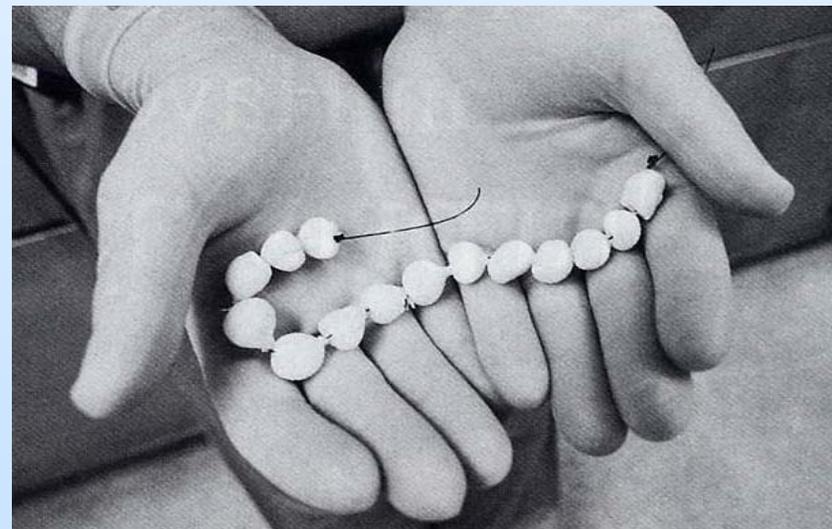
- Review current situation
- Uniqueness of the combat amputee
- Modeling an amputee care program
- Treatment
- Facility resources available
- Research opportunities/ideas

Americans In Harm's Way

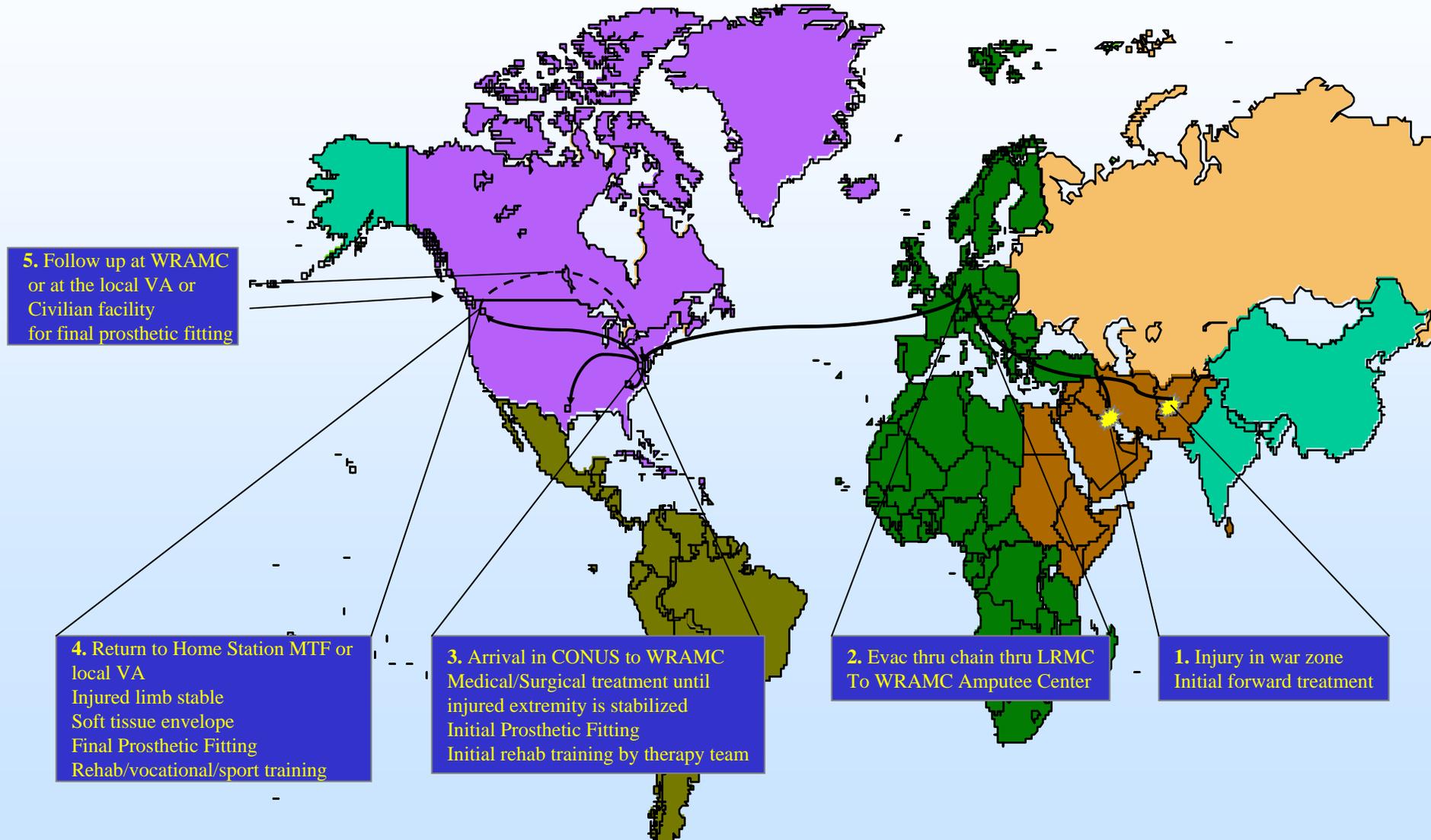


Advances in Technology

- Forward surgical/resuscitation capabilities
- Advanced evacuation capabilities
- Body Armor
 - Preservation of vital organs
 - Increased extremity injuries
- Advanced surgical techniques
 - Convert injury to clean surgical wound
 - Save as much viable tissue as possible (preserve joints)
- Advances in antibiotic tx



Medical Evacuation



Average Length Of Stay

CSH 1.8 Days

LARMC/ROTA 5.2 Days

CONUS MEDCEN 41.7 Days

*During Viet Nam the average time from Injury to reaching the amputee center at Valley Forge was 4 Weeks

Average Daily Census WRAMC patients with amputation 2003

• March	5
• April	5
• May	5
• June	2
• July	8
• August	10
• September	9
• October	10
• November	13
• December	10

Major Limb Amputees at WRAMC

Location of Injury	OEF/OIF
BKA	30
AKA	25
BE	12
AE	9
Bilateral BKA	6
Hip/Shoulder Disarticulation	4
Symes	5
BKA, Thru Knee	1
Bilateral BE	2
AE, BE	2
AK, Thru Knee / AK, Hip Disart	2
Hand	2
Through Knee	2
Foot	1
BKA, Symes	1
Bilateral BE, AKA	1
Hip Disarticulation, AKA, BE	1
Total	106



14

2

Common Co- Morbidity

Type	Percentage
Infection	82
Soft Tissue	68
Fractures	50
Nerve Injuries	24
DVT	8
Heterotopic Ossification	?
Head Injury (Significant)	6
SCI	2

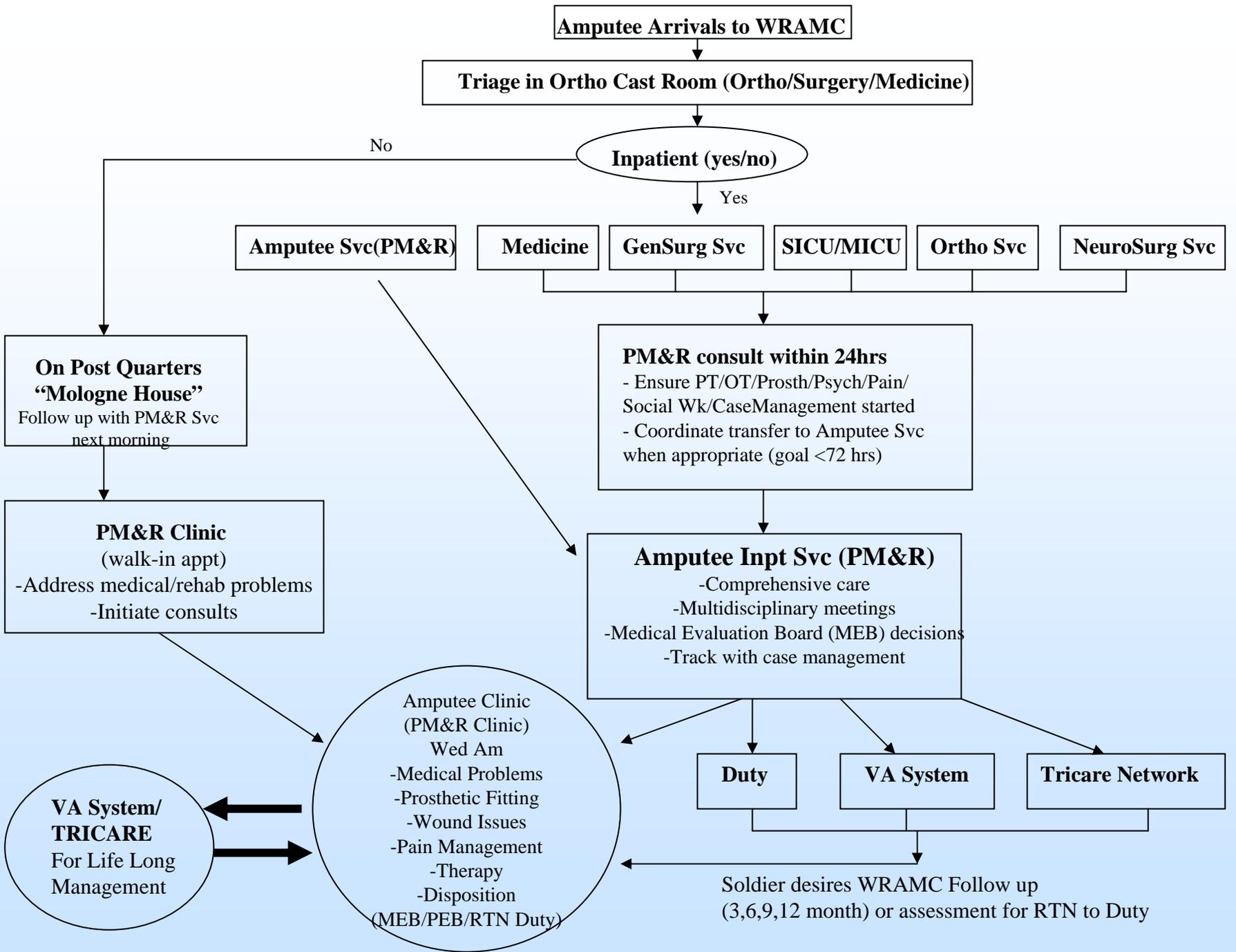


Modeling a Program

- Historical Reports (“Lessons Learned”)
 - Surgical Approach
 - Evacuation Procedures
 - Create Centers of Excellence (include GME programs)
 - Incorporate Rehabilitation Principles
 - Limit Convalescent Leave
 - Provide Holistic Care
 - Introduce Recreational/Motivational Activities
 - Establish Life-long Care
 - Better define role of the VA

Modeling a Program

- Leadership
- Command Support
- Organizational Structure
- Education
- Communication
- Teamwork
- Partnership



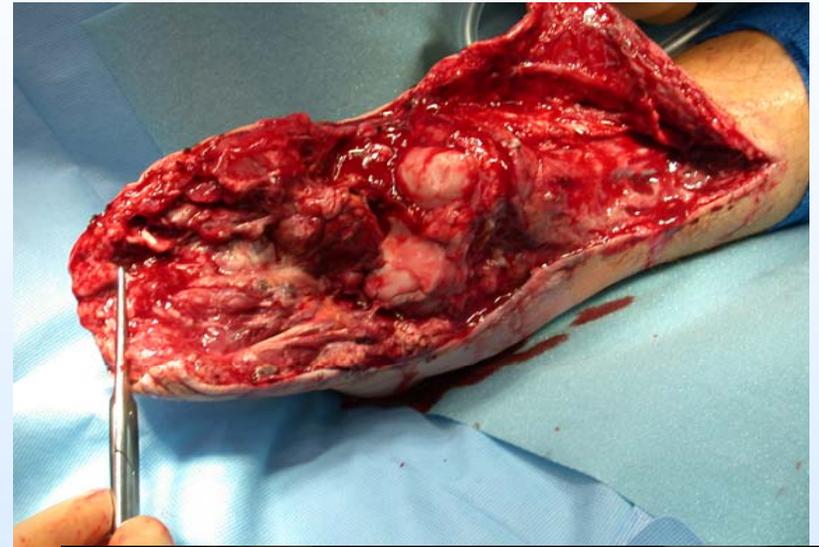
Teamwork

- Surgeons
 - All subspecialties
- Physical Medicine & Rehabilitation
- Anesthesia and Pain Management
- Nursing
- Physical Therapy
- Occupational Therapy
- Prosthetics
- Psychiatric Consultation
- Social Work
- Peer Support
- Nutrition
- Gait Lab
- Database
- Command Support
- Congress/OTSG
- PEBLO
- Public Affairs Office
- VA Counselors

Treatment

Complex Surgical Problems

- Amputee surgical procedures staged over lengthy evacuation chain at different treatment facilities
- Multiple, complex injuries
 - Multiple amputations, bone fractures
 - Wound healing



Complex Surgical Decision Making



Optimizing Length / Function

- Team decisions
 - Viability of tissue
 - Viability of nerves
 - Progress in therapy
 - Prosthetic options



Complex Rehabilitation Problems

- Co morbidities:
 - Brain Injury
 - Facial Trauma
 - Spinal Cord Injury
 - Peripheral Nerve Injury
 - Fractures
 - Internal Organ Damage
 - Pain Management
 - Poor wound closure



Vacuum Assisted Closure



Plastic Surgery



Infections

- Dirty wounds require frequent returns to the OR for washouts as well as revisions.
- Infection Control: all incoming hospitalized wounded swabbed (nares, axilla, and groin) to rule out MRSA
- *Acinetobacter baumannii*, some sensitive and some resistant to abx
- WRAMC experience
 - 37 patients with *Acinetobacter* out of 442 medical evacuees screened
 - Others: 18 with MSSA, 6 with MRSA, 5 with Staph
 - 3 identified cases of nosocomial spread of MDRO *Acinetobacter*

Co-morbid SCI / TBI

- VA Partnership
- Ordering Helmets
- Medical Management
 - Bowel/Bladder
 - Skin
 - Medications
 - Seizure
 - Agitation
 - Drowsiness



Co-morbid Nerve Injuries



Pain Management

- Peri-operative
 - PCA
 - Regional Anesthesia
- Co-morbidities
- Residual limb
- Phantom limb
- Multi-modal Approach
 - Opioids
 - Long acting
 - Short acting
 - Anticonvulsants
 - TCA's
 - NSAID's (COX-2)
 - TENS
 - Topicals
 - Sleep (Quetiapine)
 - Botox

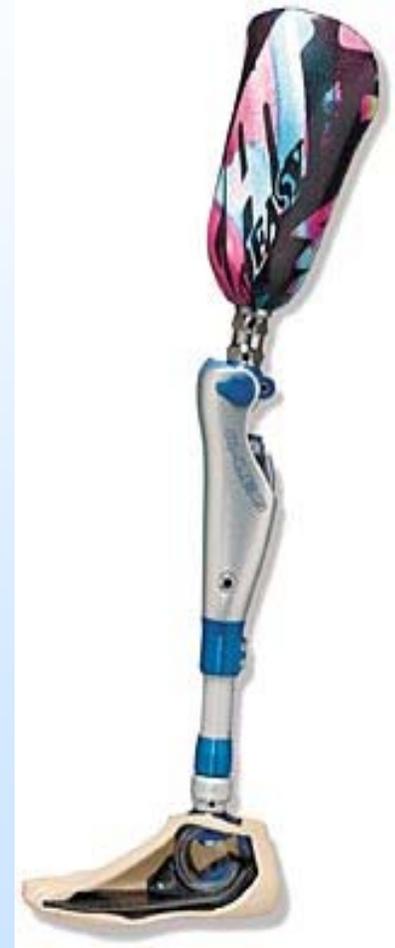
Prevent/Treat Complications

- DVT/PE:
 - Increased Risk
 - Asymptomatic
 - Prophylaxis
- HO
 - Healing
 - Pain
 - Prosthetic fitting
 - Treatment



Prosthetic Fitting

- Pre-Surgical Consultation
- Meet functional goals
- Leading Edge Technology
- CAD/CAM



Prosthetic Fitting

- Immediate post-op prosthetic use often not possible:
 - Homodynamic stability
 - Weight bearing status
 - Wound healing
 - Limb maturation

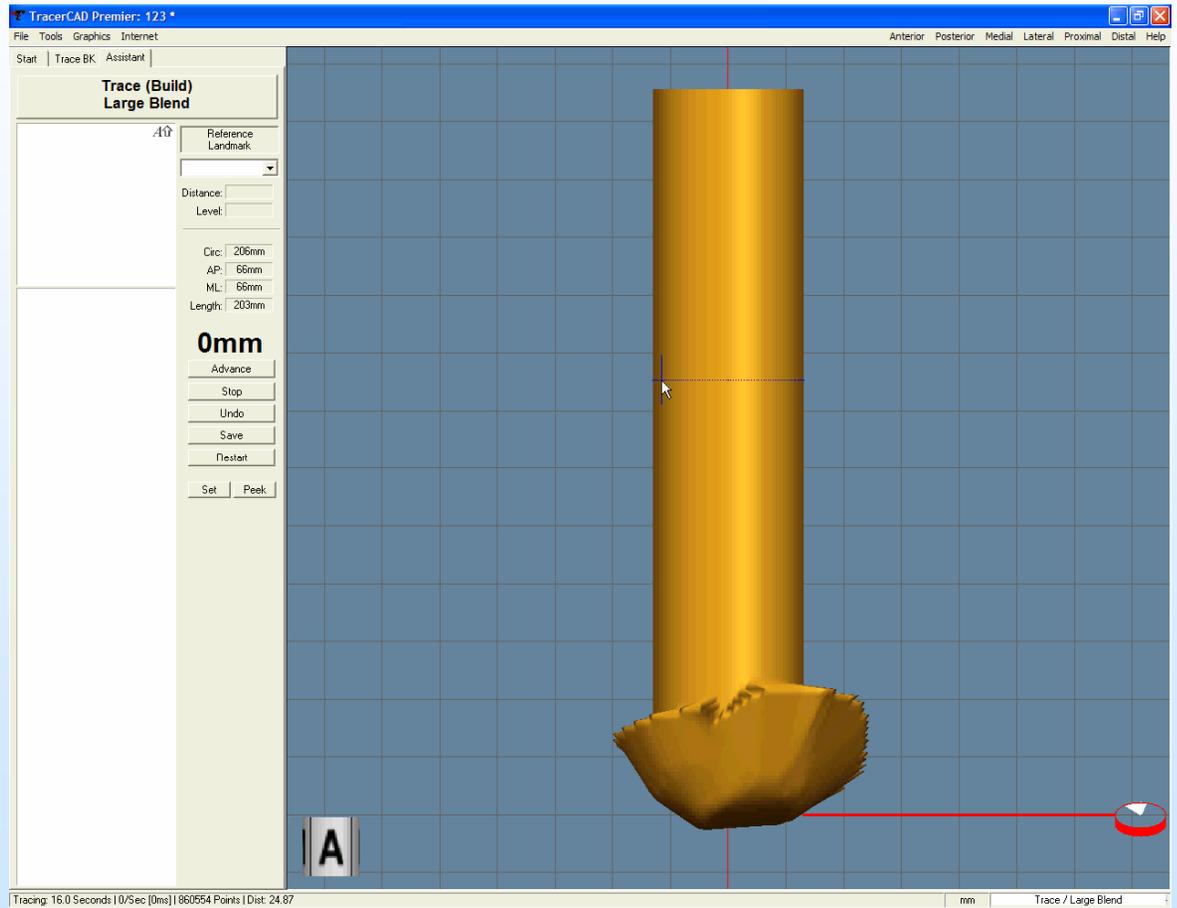


Lower Extremity Prostheses

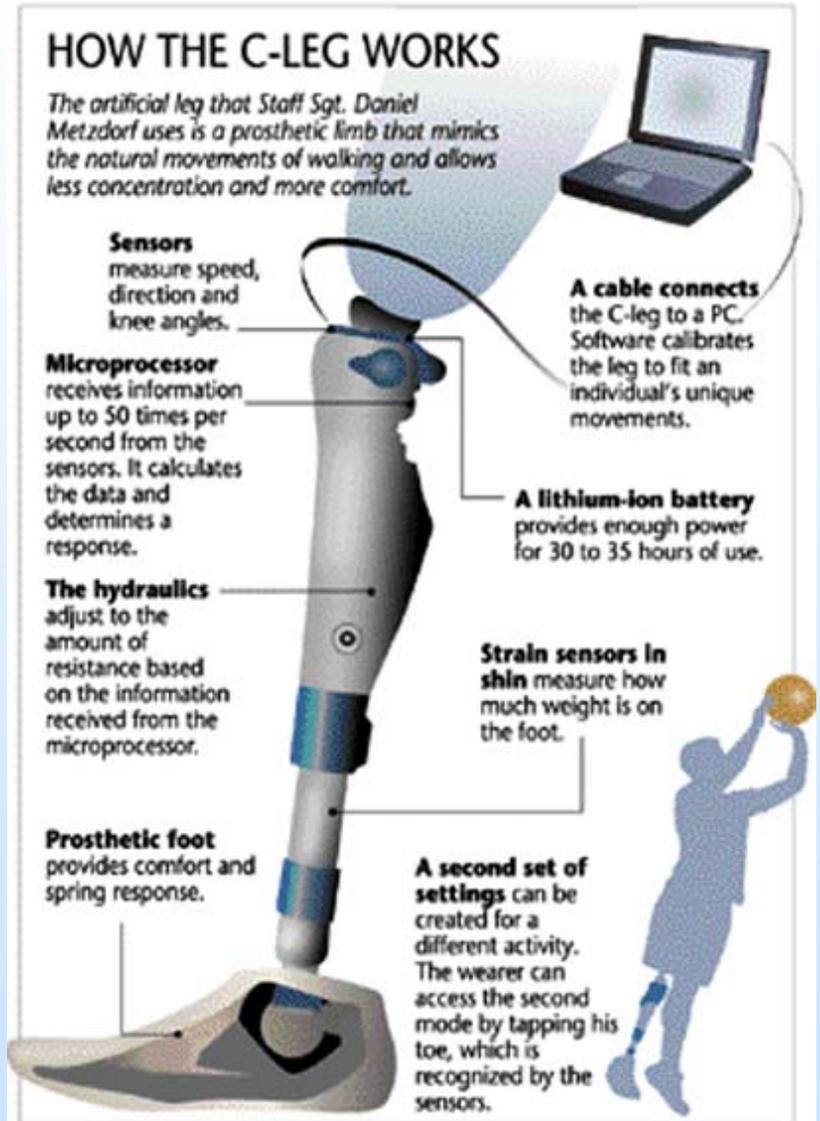
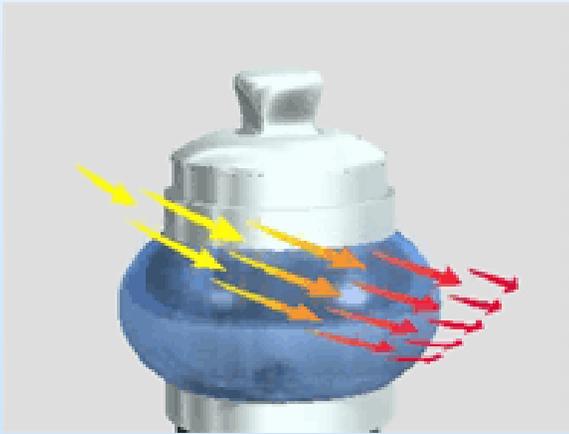
- Complex Wounds
- Scar Lines
- Rapid Volume Changes



CAD/CAM



Advances in Technology



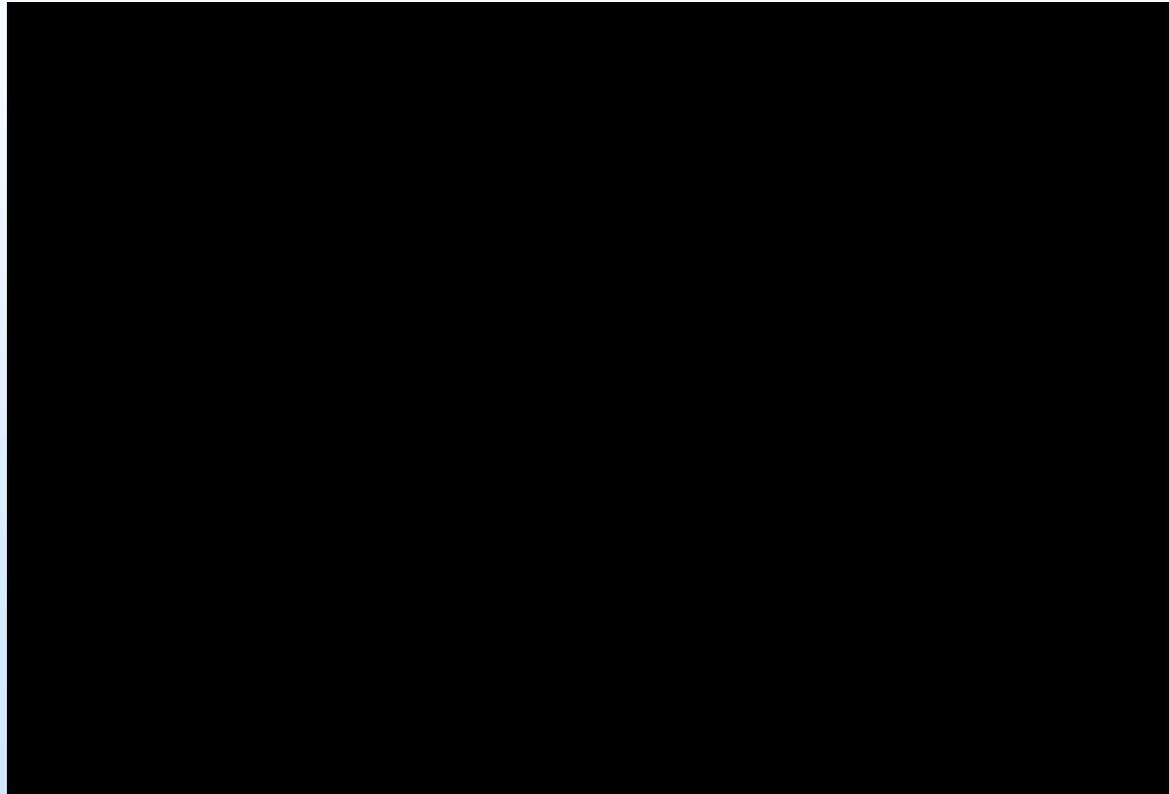


Upper Extremity Prostheses



Upper Extremities

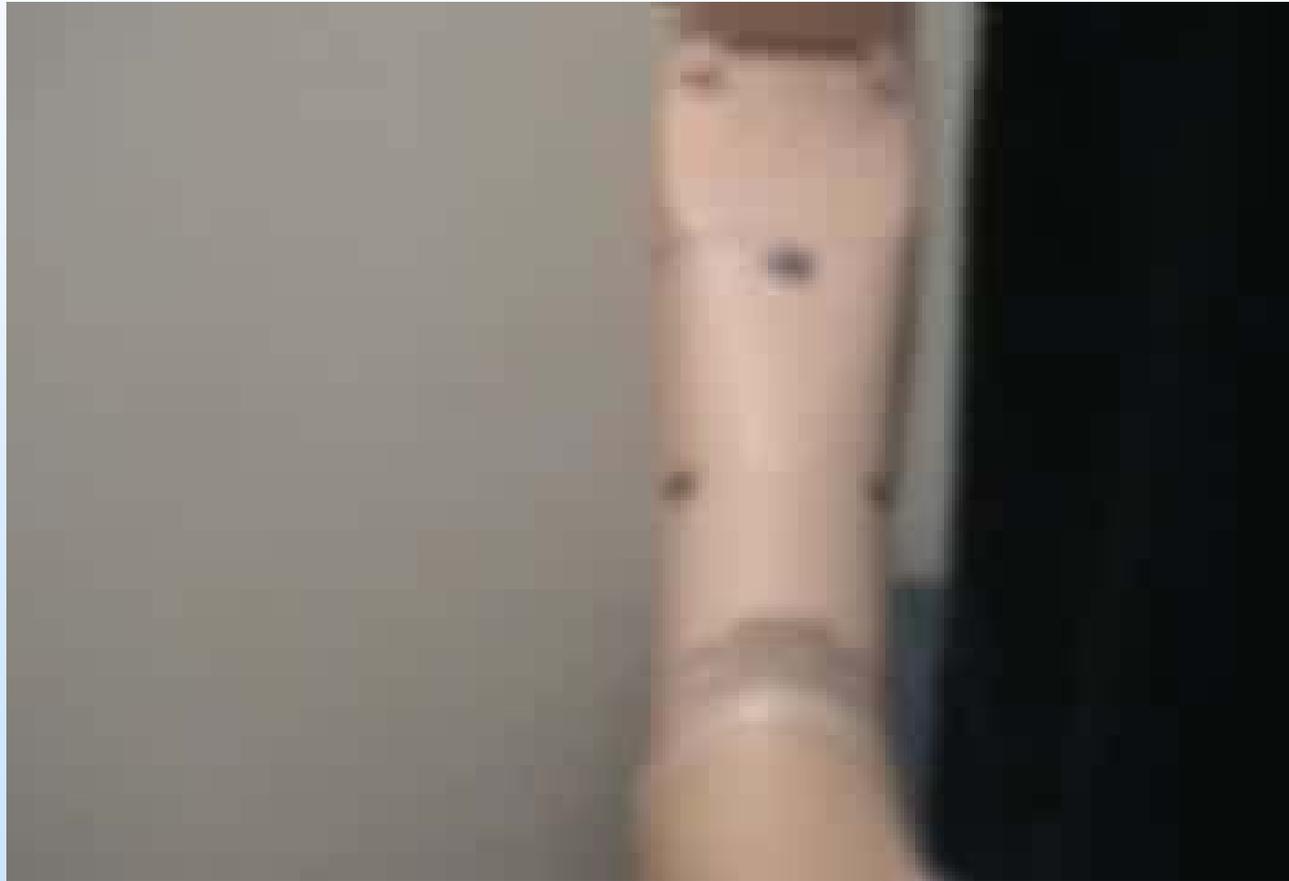
- Nature of wounds limit body-powered
- Myoelectric training can begin immediately



Advances in Technology



Advances in Technology

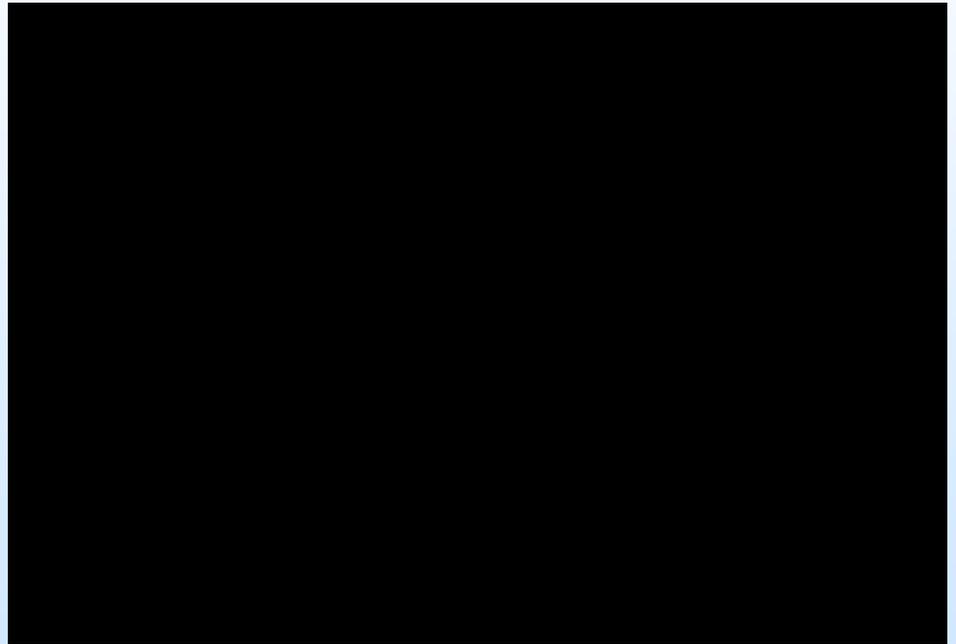


Cosmetic Prostheses

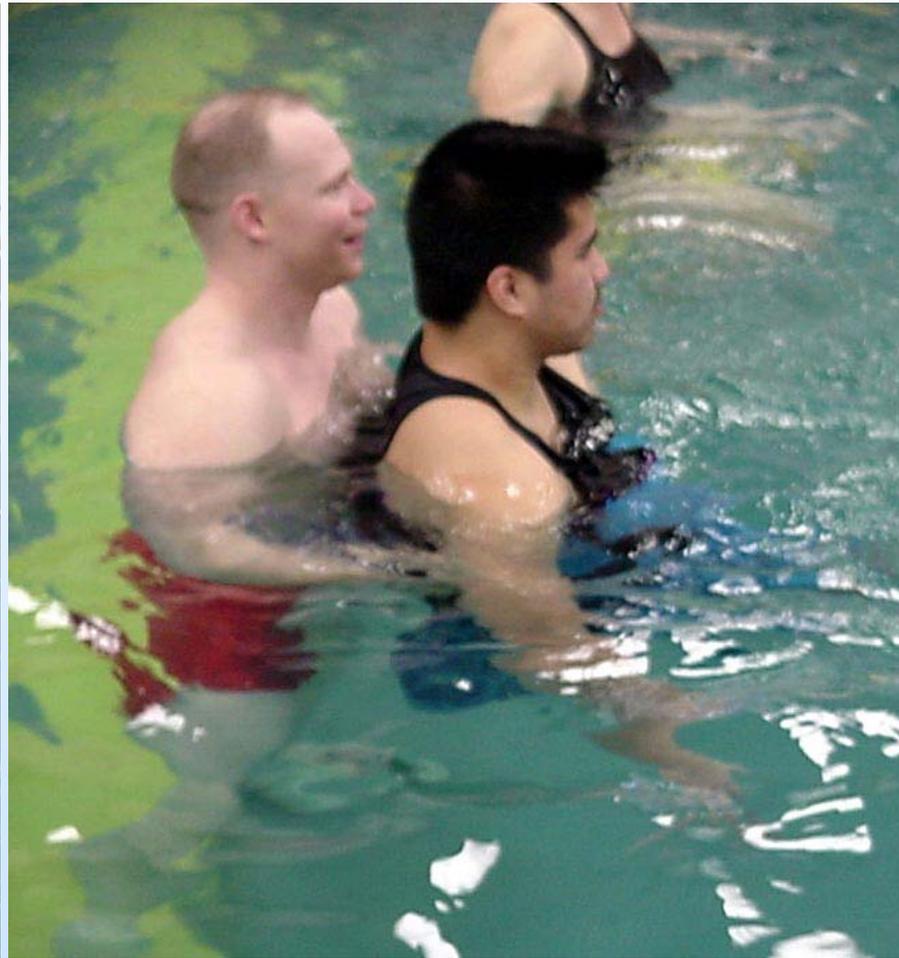


Physical Therapy

- Therapist Education
- Donning/Doffing
- Basic Mobility Skills
- Strength Training
- Gait Training
- Balance Training
- Co-morbidity Rehab
- Advanced Skill Training



Pool Therapy



Advanced Activities



Return to Duty

Occupational Therapy

- Prosthetic Donning/Doffing
- Myoelectric training
 - Myoboy
- Gross motor skills
- Fine motor skills
- Activities of Daily Living
- Community Reintegration

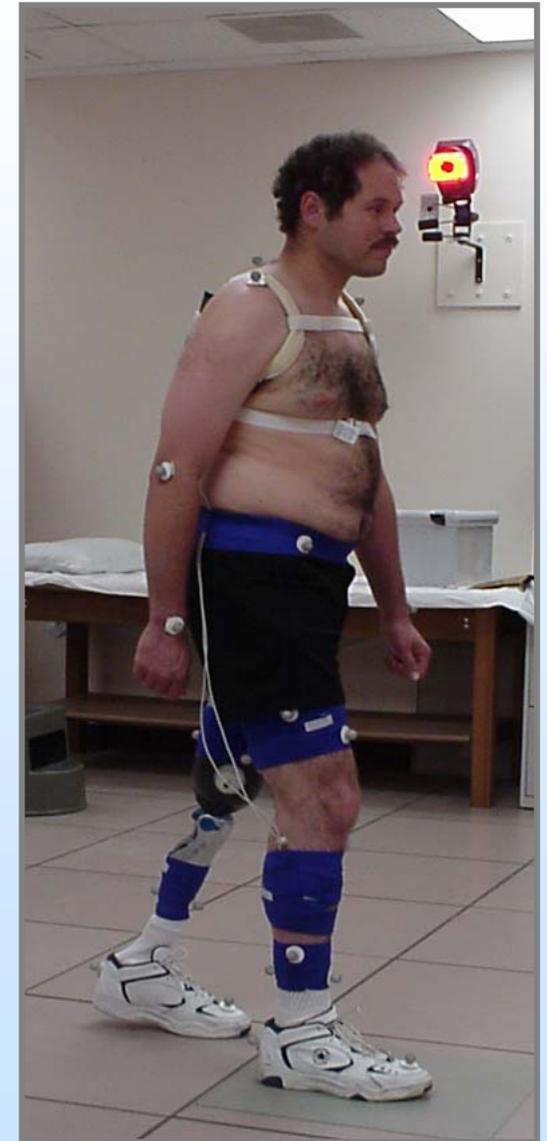
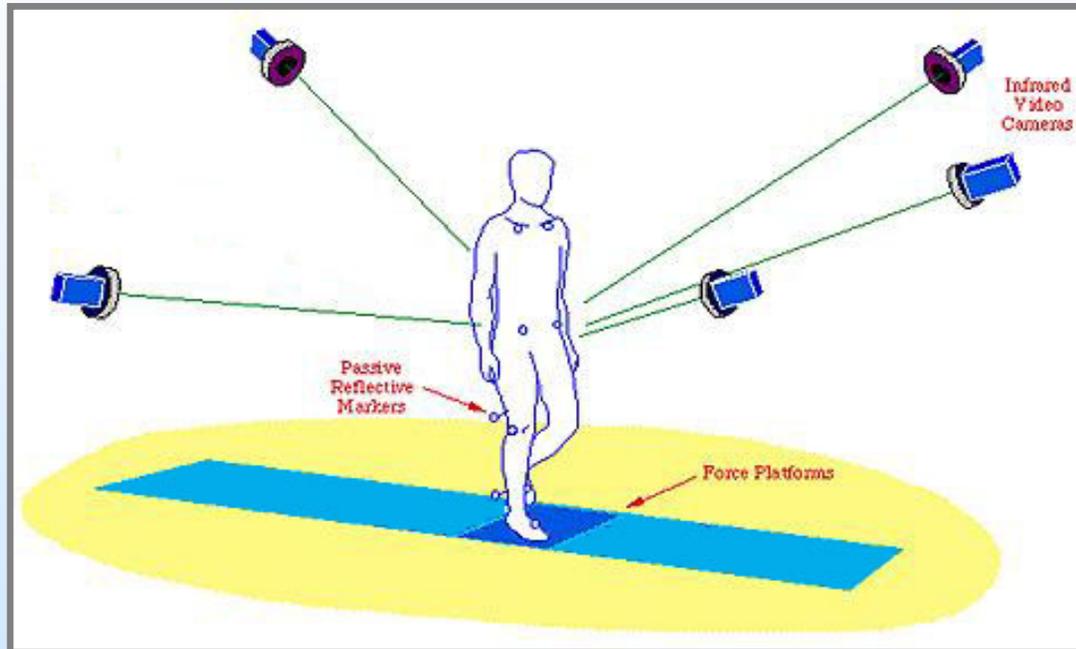


Apartment

- Kitchen
- Bedroom
- Laundry
- Office

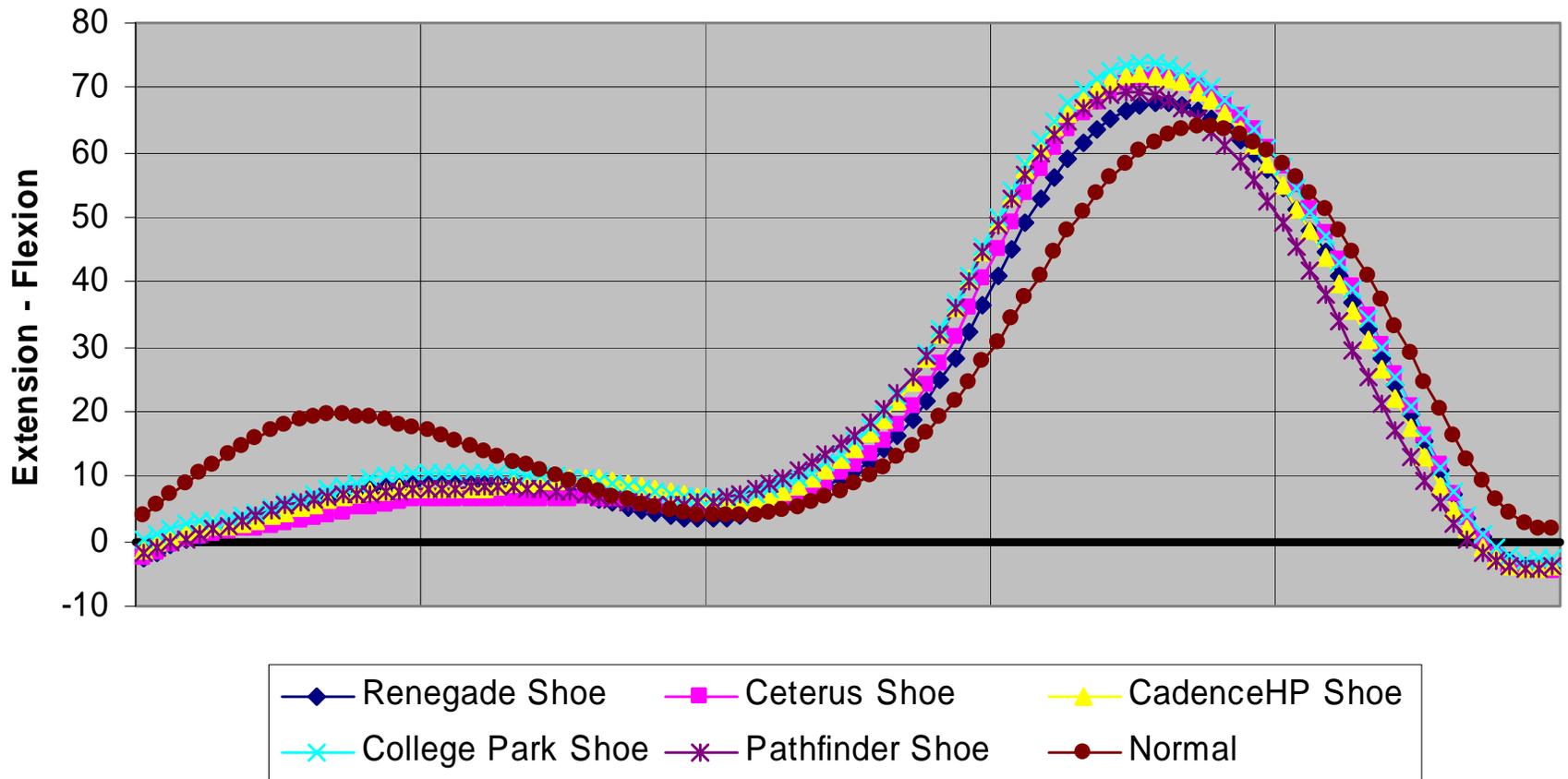


3D Motion Analysis Lab

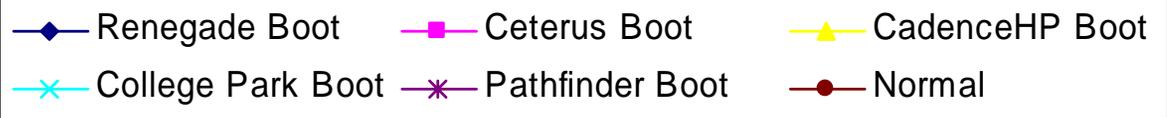
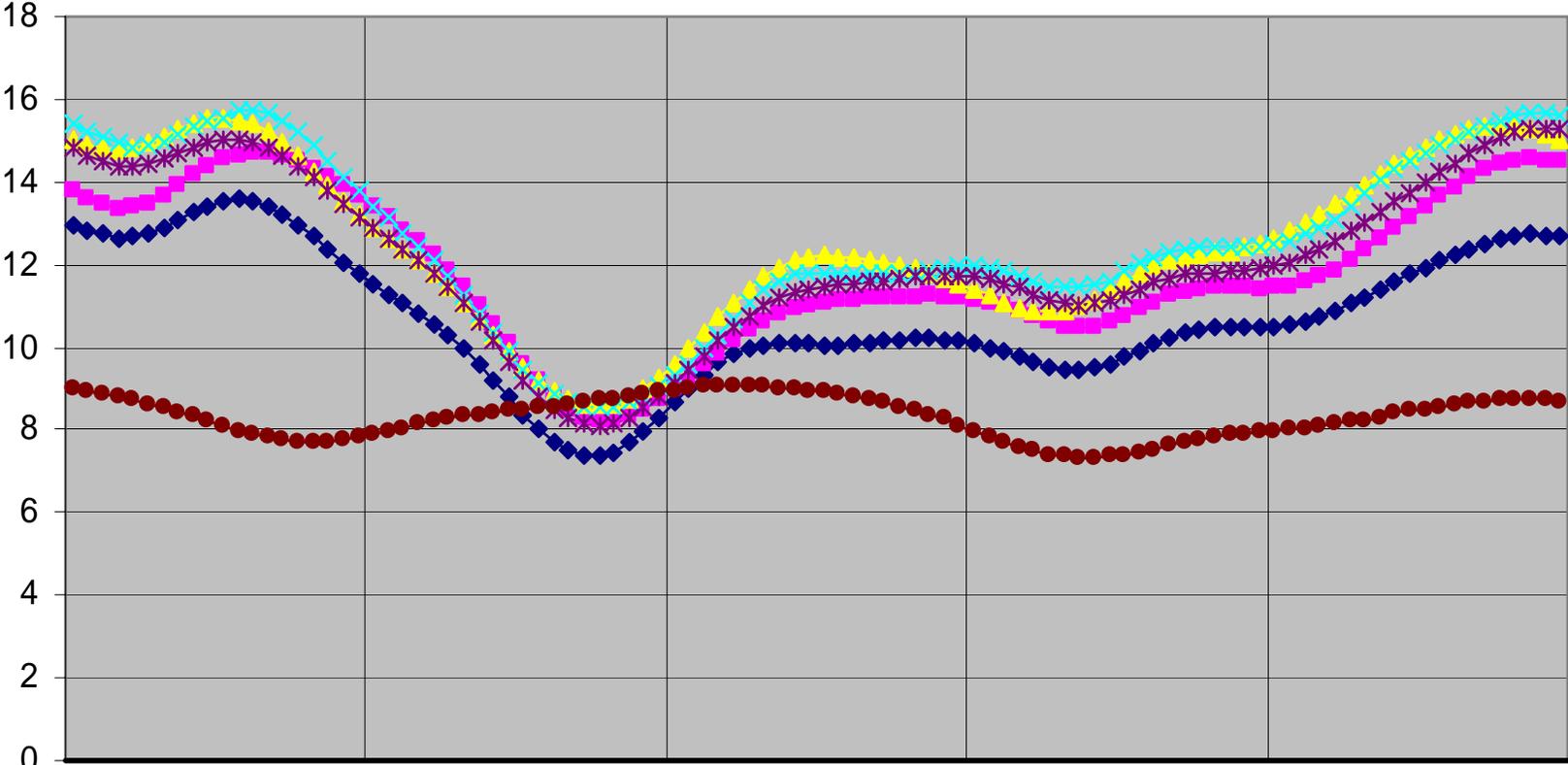


Comparison of 5 Prosthetic Feet Sneakers vs. Army Boots

Prosthetic Knee Flexion Sneaker



Pelvis Forard Tilt Boots



Unique Psycho-Social Needs

- Adjustment to loss at young age
 - Limb
 - Other bodily functions
 - Friends
 - Separation from unit
- Duty status
 - AD, NG, Reserves
 - Duty station vs. Home
 - MEB/PEB
 - Perceptions of VA
- Social support system
- Premorbid socio-economic status
- Political beliefs
- Religious beliefs



Peer Support

- Special person
- Training available (ACA)
- Extremely valuable
 - Patient
 - Rehab Team



Recreational/Motivational Therapy



Unique Pre-morbid Activity Level

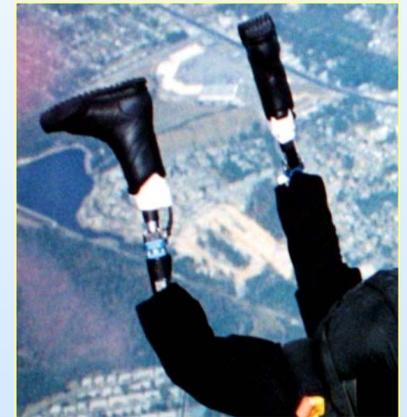


Photo presented to WRAMC from
D. Bowman

Public Affairs

“..they cope with grievous combat injuries, mostly unknown in civilian hospitals. The best military hospitals arguably stand shoulder to shoulder with top academic centers in terms of training and research.”



“Our fine young sons and daughters of America who’ve given so much to our country are getting the best care possible for their injuries...”

American Academy of Orthopaedic Surgeons President James H. Herndon, MD.

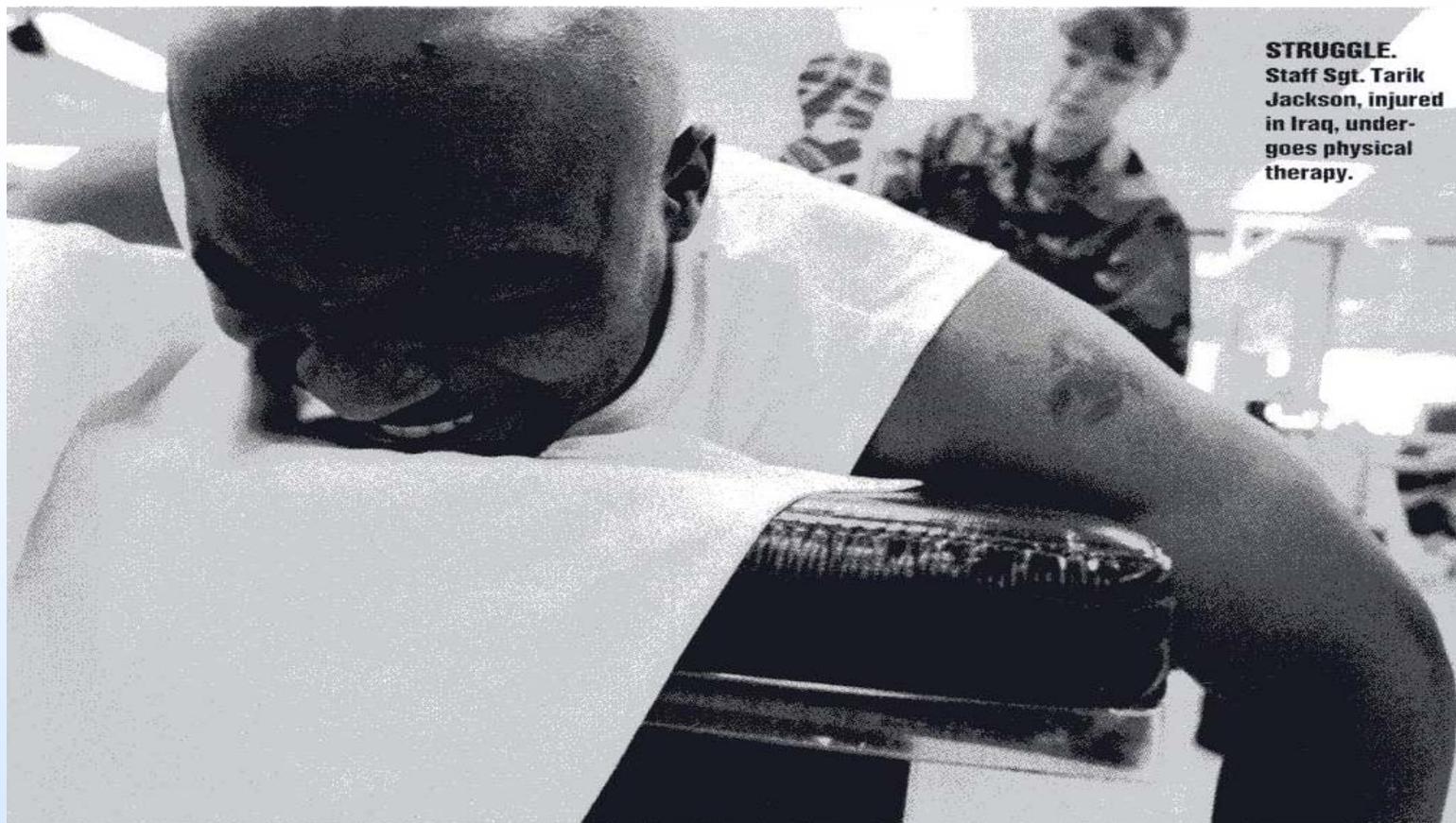


AAOS extols military surgeons

Page 33

- 13/ *Subspecialty sports certification: Debate continues*
- 42/ *Annual Meeting of future: What should it look like?*
- 45/ *AAOS co-sponsors summit: Wrong-site surgery*
- 47/ *Safer surgery: Road map for change*
- 64/ *Medical liability reform: Campaign moves forward*

David W. Peck, Jr., MD
8741 SUSANNA LN
BETHESDA MD 20815-4713



STRUGGLE.
Staff Sgt. Tarik
Jackson, injured
in Iraq, under-
goes physical
therapy.

THE FRONT LINES OF HEALING

When injured soldiers come home, Walter
Reed hospital helps them get their lives back

la Repubblica delle Donne

Gaza
IL MURO CHE
HA FALLITO

Inseminazione
DOPO LA LEGGE
LE COPPIE VANNO
ALL'ESTERO

Architettura
MA CHE BEL
PARCHEGGIO!

Bellezza
TENTAZIONE
PERFETTA

Anno 8° N.381 del 20 dicembre 2003



PROMISE KEEPER



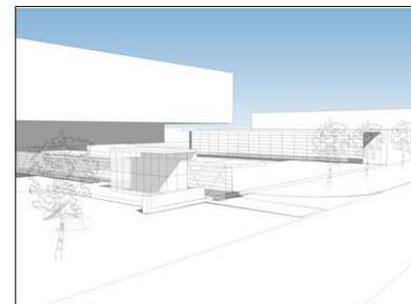
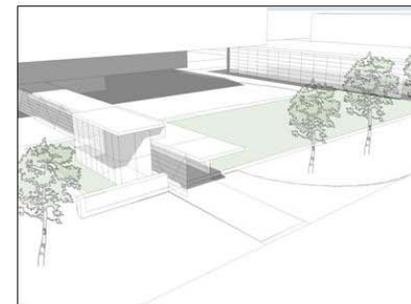
Agence France-Presse

President Bush joined Army Staff Sgt. Michael McNaughton for a run at the White House. Mr. Bush vowed to jog with him when he recovered from injuries sustained in Afghanistan. Story, A6.

**New Facility
Proposal for
Advanced Rehabilitation**

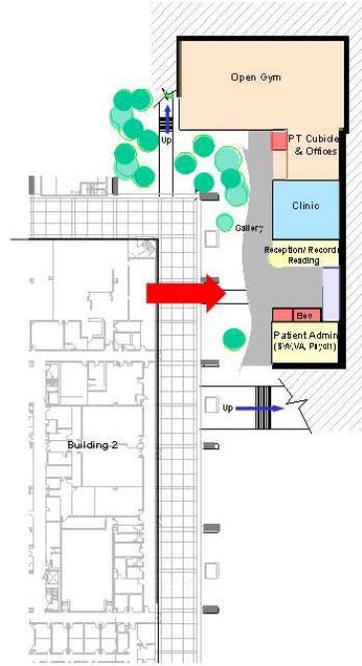


Building form

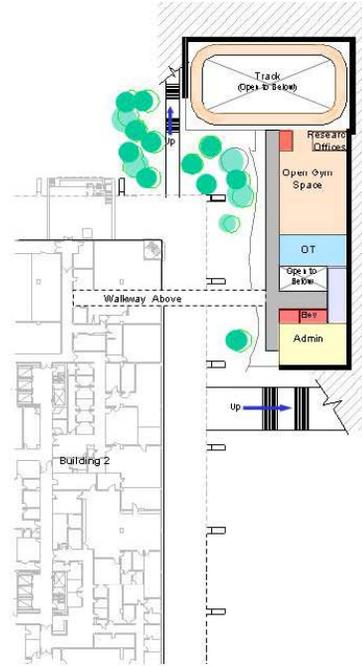




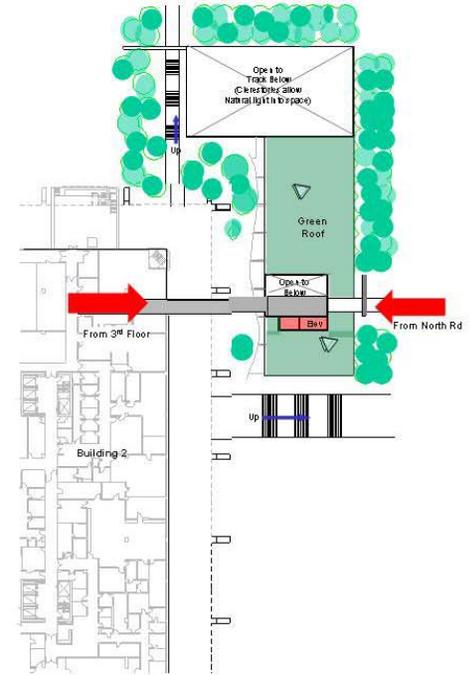
Roof Plan/ Site Plan



First Floor



Second Floor



Third Floor

Color Code:

- | | | |
|--|--|----------------------|
| Open Gym/ Track (includes offices, research areas & storage) | Support (Includes Public Toilets, Showers, Storage, Lounges) | Circulation |
| Clinic Area | Administration (includes Reception & Records) | Vertical Circulation |
| Entry | | |

Key Plan





VEHICLE SIMULATOR



CLIMBING WALL



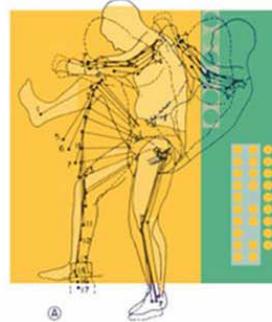
ELEVATED RUNNING TRACK



EASY STREET, OCCUPATIONAL THERAPY



OPEN ATHLETIC & SPECIAL EQUIPMENT AREA



Prior to analyzing McNaughton's gait, Barri Miller, Walter Reed Orthopedic Center, raises McNaughton's C-leg to ensure motion-sensing digital cameras can see reflectors placed on it.



PFC. Tristan Wyatt, 21, tries on his computerized titanium and graphite prosthetic leg at Walter Reed Army Medical Center under the supervision of his prosthetist. Wyatt lost his right leg in a rocket explosion in Iraq in August.



KINEMATIC STUDY

Research Opportunities

- Epidemiological
- Information Technology
- Surgical Management
- Medical Management
- Pain management
 - Stump pain
 - Phantom Pain
- Wound management
- Psycho-social
 - Rapid Community Reintegration
 - PTSD
- Therapy Techniques
- Prosthetic Advances
 - New materials & components
 - Meet demands for return to duty
 - Develop guidelines for prosthetic prescriptions

Research Opportunities

- Develop Clinical Pathways
- Outcomes Measures (validity/reliability/cost)
 - Mobility
 - Functional
 - Quality of Life
 - Advanced Activities
 - Gait Parameters
- Long-term Studies
 - Prevention of OA (knee, hip, shoulder)
 - Back Pain
 - Cardiac (O₂ consumption)

The Future

- Limb salvage
- Artificial muscles
- Genetic reengineering
- Limb regeneration



Exoskeletal Systems



▶ HOME

POPULAR science

MIND OVER MACHINE



The Washington Post

MONDAY, JULY 21, 2003

Moving Forward, One Step at a Time

After Iraq, Wounded Soldiers Try Out New Limbs, New Lives

Second of two articles

By TAMARA JONES and ANNE HULL
Washington Post Staff Writers

A fat C-141 rumbles to a halt at Andrews Air Force Base. A gangplank is lowered from the belly of the plane, and the Army's latest casualties from Iraq hobble or are carried to a waiting white bus, their gear still covered with fine desert dust.

These medevac flights are now so routine that no cameras, no VIPs, await the wounded. Their welcome home happens at Walter Reed Army Medical Center, the nation's biggest military hospital, where doctors and nurses in camouflage fatigues wait at the curb to whisk the newest patients to the large exam room on the second floor. Here the soldiers are triaged with swift precision:

"I need 10 of morphine!" a doctor calls out.

"Are you weak in your right hand?" another asks.

"Where does it hurt you now?"

A 20-year-old private moans. In Baghdad, he camped out in a bathroom of Saddam Hussein's palace, stacking his Chips Ahoy on the shelves above the gold-ingot faucets. Now he lies on a gurney with shrapnel in his belly, beneath a balloon that says, "You're the Best!"

Upstairs on the orthopedics ward, the beds



BY MICHAEL LUTZKY—THE WASHINGTON POST

Healing: *Tyson Matthews pulls up Garth Stewart's pants leg for Jason Neale and Bobby Bullard to get a better look at his new leg.*

are already filled with recovering casualties from the war in Iraq. There are different battles being fought on Ward 57, more private struggles. It's not about victory, but coping. Not about war, but its aftermath.

First Lt. John Fernandez is a veteran of Iraq and by now a veteran of Ward 57, too. He reports to an exam room early one morning for his twice-daily dressing change. The former

West Point athlete is 25, a newlywed whose wife, Kristi, hasn't left his side since he arrived at Walter Reed six weeks earlier. They had been married less than a month when John shipped out. His hospital room would become their first home together; the nurses looked the other way when Kristi, 22, moved a cot next to John's bed

See WALTER REED, A10, Col. 1

