MATRIXX™

POWER SUIT CO. LLC *US 8,443,465 B2*

THE MATRIXX POWER SUIT CO. LLC

Presents

Wearable Wellness Technology That Improves Your Health & Performance

Private Research Study
By Dr. Bijan Najafi PhD
Baylor College of Medicine

Global Wellness Summit 2017

Baylor College of Medicine
MICHAEL E. DEBAKEY DEPARTMENT OF SURGERY

Patented Wearable Wellness Technology

MATRIXX POWER SUIT CO. LLC *US 8,443,465 B2*

Private Research Study conducted by:

- **Dr. Bijan Najafi Ph.D.** Professor of Surgery, Director of Clinical Research, Division of Vascular Surgery and Endovascular Therapy, Director of Interdisciplinary Consortium on Advanced Motion Performance (iCAMP), Michael E. DeBakey Department of Surgery **Baylor College of Medicine**

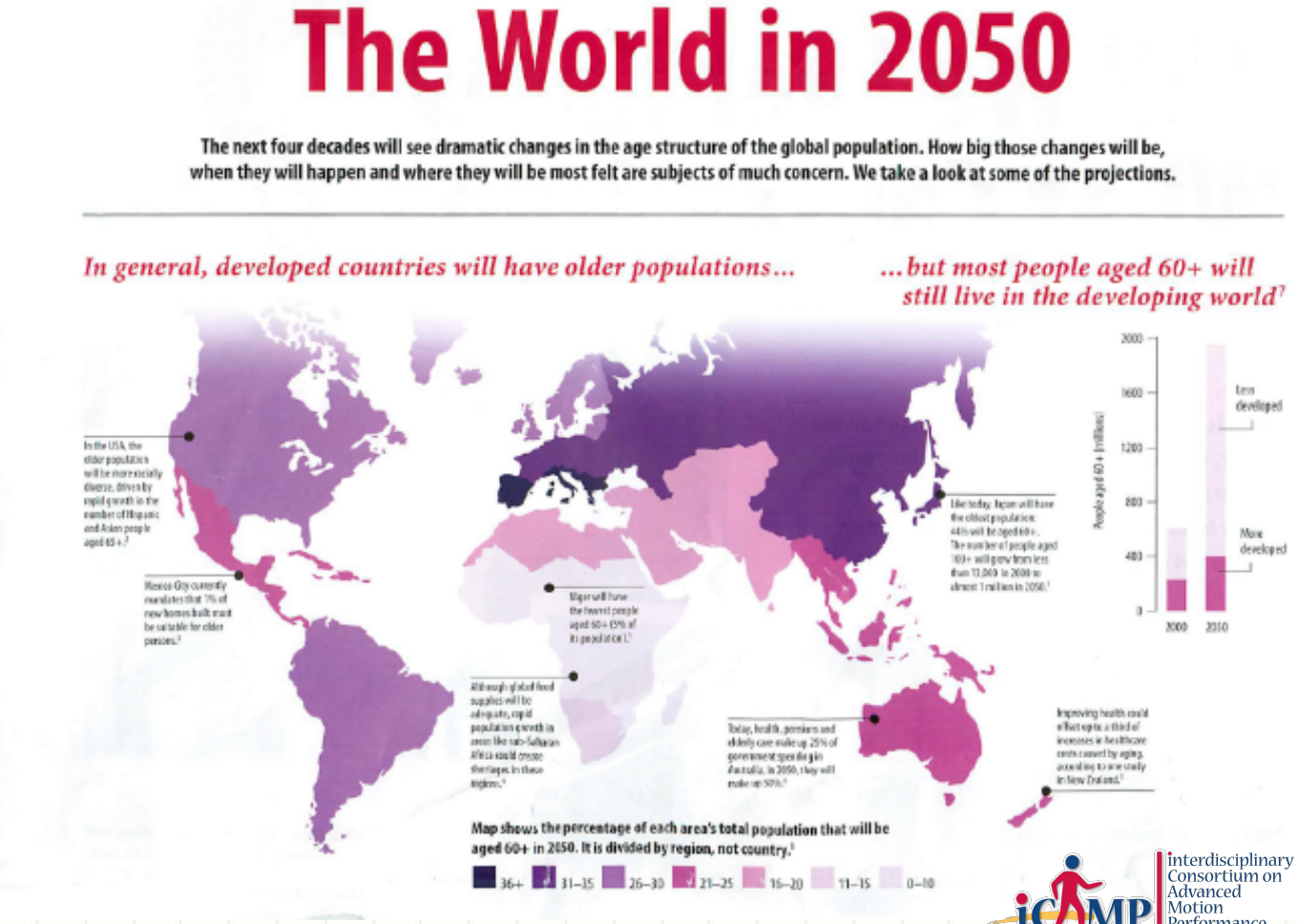
Dr. Najafi is currently conducting an in-house study at **Baylor** with **Matrixx technology.** He is using game-based exercise combined with Matrixx technology to magnify benefits of several interactive and personalized Balance training interventions for in-hospital, in-clinic, and in-home body and mind exercises for Diabetes Patients with pain, balance problems and lost feeling in the feet and ankles.

“Demography is destiny“

August Compte, 1798-1857

MATRIX® POWER SUIT CO. LLC *US 8,443,465 B2*

- ***By 2015, one in five people will be aged 60+ in the world, they will outnumber people under 14!***



Baylor College of Medicine

MICHAEL E. DEBAKEY DEPARTMENT OF SURGERY

iCAMP interdisciplinary Consortium on Advanced Motion Performance

Statistics: Elderly Population

MATRIX POWER SUIT CO. LLC *US 8,443,465 B2*

Every second, an older adult falls in US

Every 1 second
An older adult falls every second of every day.

Every 20 minutes
an older adults dies from a fall in the US. Many more are injured

1 in 4
One in four older adults reported a fall in 2014.

$31 billion
Annual direct medical Expenses for older adult falls cost over $31 billion, these costs Will surge unless preventive measures are adopted.

#1
Falls are the # cause of hip fractures.

http://www.cdc.gov/steadi, **Stopping Elderly Accidents, Deaths & Injuries (STEADI)** (updated on Oct 12, 2016)

iCAMP Interdisciplinary Consortium on Advanced Motion Performance

Baylor College of Medicine
MICHAEL E. DEBAKEY DEPARTMENT OF SURGERY

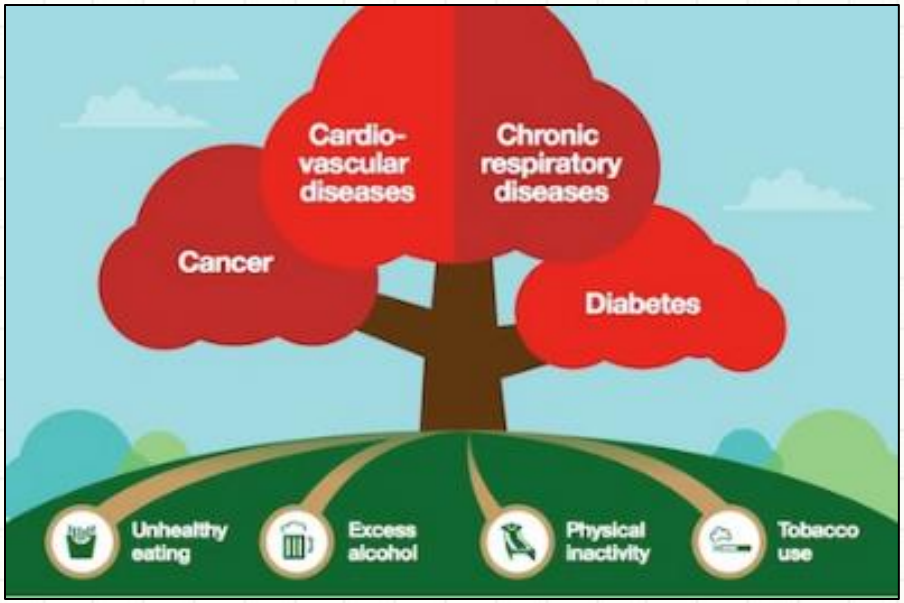
Non-communicable disease (NCDs)

Cancer, diabetes, CVD/PAD, and COPD

MATRIX™
POWER SUIT CO. LLC *US 8,443,465 B2*

@ 2009

For the first time in the history of humankind:



Non-communicable diseases (NCDs) have become the leading cause of global mortality (60%).

Zarocostas J. Non-communicable diseases must have greater priority, says WHO [news].
BMJ 2009;339:b2857. doi:10.1136/bmj.b2857

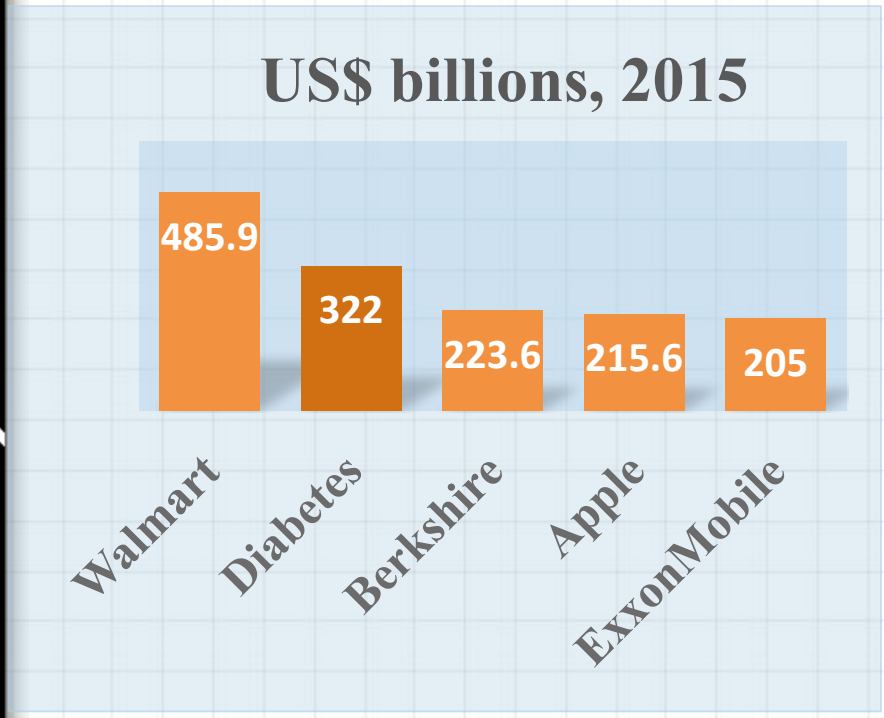
iCAMP interdisciplinary Consortium on Advanced Motion Performance

Baylor College of Medicine
MICHAEL E. DEBAKEY DEPARTMENT OF SURGERY

Cost of diabetes

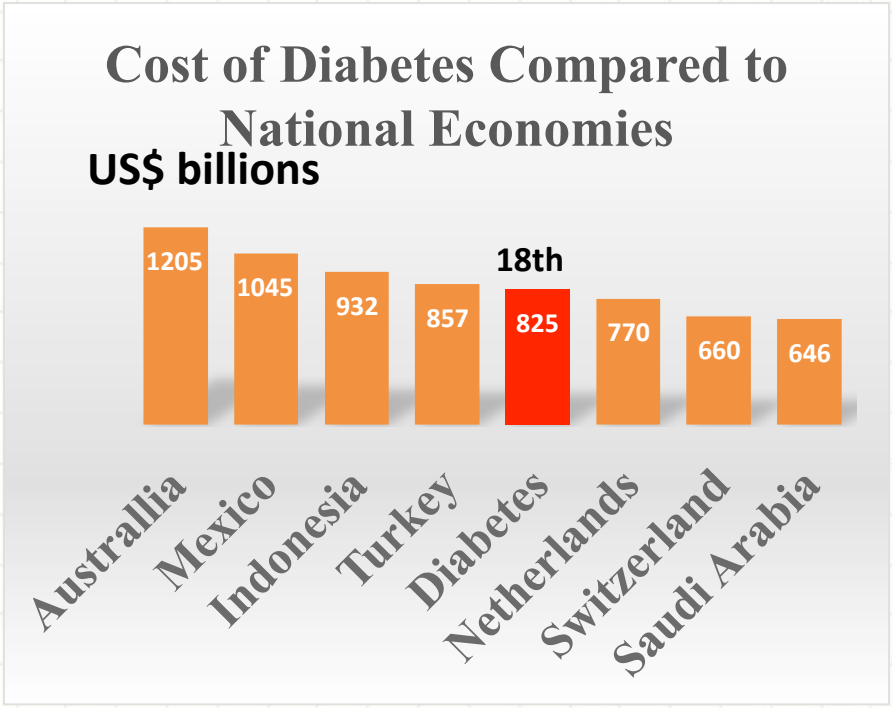
MATRIX POWER SUIT CO. LLC *US 8,443,465 B2*

Annual cost of Diabetes in USA is $322b



Sanofi

Global Direct cost of Diabetes (2016)



Harvard T.H. Chan School of Public Health

iCAMP interdisciplinary Consortium on Advanced Motion Performance

Baylor College of Medicine
MICHAEL E. DEBAKEY DEPARTMENT OF SURGERY

Diabetes increases risk of falling

MATRIX™
POWER SUIT CO. LLC *US 8,443,465 B2*

- **Individuals with diabetes are prone to fall** for reasons such as decreased sensorimotor function, musculoskeletal/neuromuscular deficits, foot and body pain, pharmacological complications, and specialty (offloading) footwear devices
- **High risk of fall** in the diabetic peripheral neuropathy (DPN) population, with an overall incidence of **1.25 fall/person-year, 5-12 times higher than general older adults**
- Over 70% of adults, age 65+ with diabetes reported **a mobility limitation,** which will limit their ability to treatment management like wearing offloading for the purpose of wound healing

Najafi et al (2012), Diabetes Management

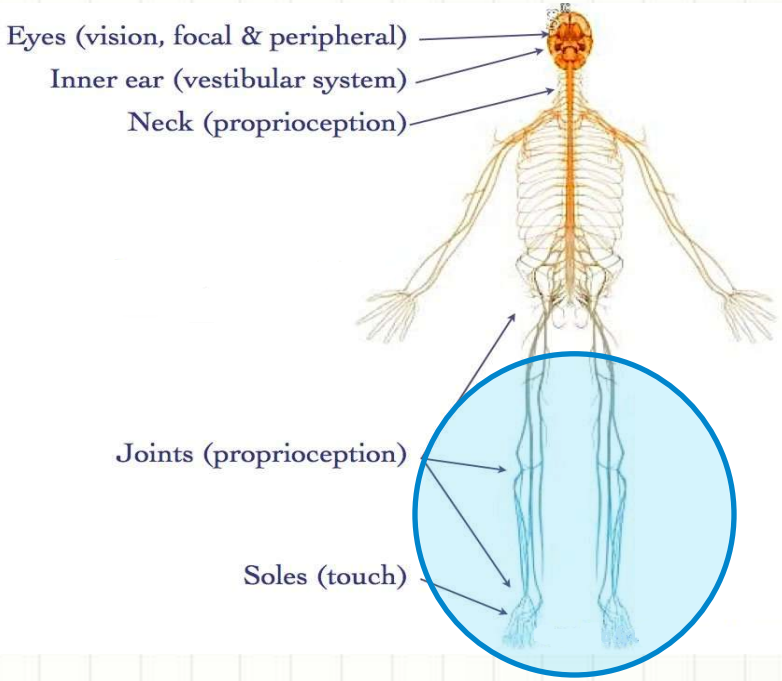
iCAMP Interdisciplinary Consortium on Advanced Motion Performance

Baylor College of Medicine
MICHAEL E. DEBAKEY DEPARTMENT OF SURGERY

How to explain poor balance in diabetes patients

How underlying balance mechanism alters with diabetes based on dependency on sensory feedback?

- **Central-control:** Central mechanism in longer intervals of body sway by recruiting sensory feedback from visual, vestibular and/or somatosensory systems
- **Local-control:** local postural muscle control works without recruiting sensory feedback by setting an activity level required for postural muscles to control the short-term body fluctuations



Toosizadeh,…, Najafi (2015), PLOS ONE

The Art of Motor Learning

MATRIX®
POWER SUIT CO. LLC *US 8,443,465 B2*

By practice, **our Brain learns** how to deftly and robustly command motor activation patterns that allow us to talk and sing; sit and stand; run and jump; and throw and catch - **often without even paying attention or receiving any information from sensory feedback**.

iCAMP Interdisciplinary Consortium on Advanced Motion Performance

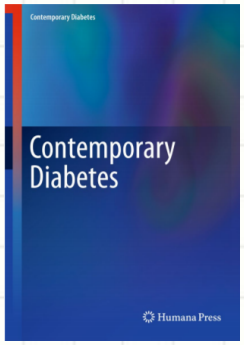
Baylor College of Medicine
MICHAEL E. DEBAKEY DEPARTMENT OF SURGERY

Balance Training
~ Conventional Methods

MATRIX POWER SUIT CO. LLC *US 8,443,465 B2*

❑ Physiotherapy

Aerobic exercise, Resistance exercise, and Flexibility exercise



- The major gap in conventional exercise programs is lack of **brain exercise**
- *The conventional exercise programs do not provide interactive motor-error information to assist the patient to compensate motor-deficit via perception of errors in particular among those with sensory deficits (e.g. diabetes with neuropathy complication)*

Najafi, Patel, Armstrong (2017), Contemporary Diabetes (Series Ed.: A. Veves)
"Exercise Programs to Improve Quality of Life and Reduce Fall Risk in Diabetic Patients with Lower Extremity Disease"

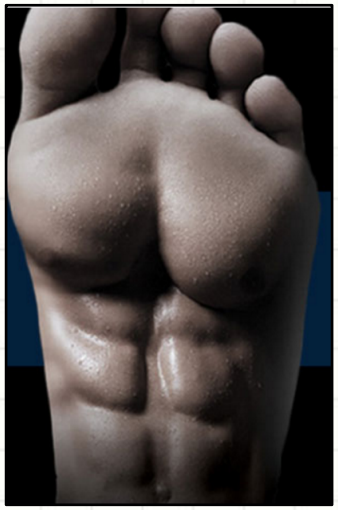
iCAMP Interdisciplinary Consortium on Advanced Motion Performance

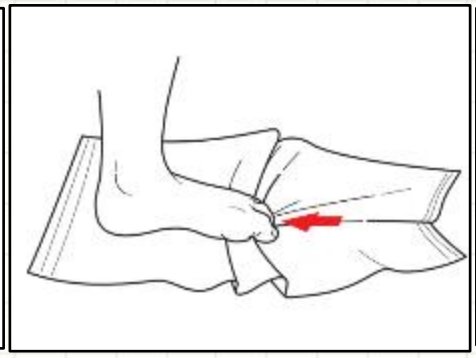
Baylor College of Medicine
MICHAEL E. DEBAKEY DEPARTMENT OF SURGERY

Balance Training
~ Conventional Methods

MATRIX™
POWER SUIT CO. LLC *US 8,443,465 B2*

❑ Foot & Ankle Exercises





- While these exercises are effective and suitable for those with poor balance, it lacks of **brain exercise**

Schwenk, …, Najafi (2013), JAPMA

iCAMP interdisciplinary Consortium on Advanced Motion Performance

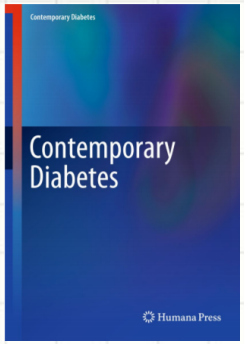
Baylor College of Medicine
MICHAEL E. DEBAKEY DEPARTMENT OF SURGERY

Balance Training
~ Conventional Methods

MATRIX POWER SUIT CO. LLC *US 8,443,465 B2*

❑Motor-Cognitive Exercises

Tai-Chi, Yoga, Pilates exercise, etc…



- These exercises include cognitive exercise and has been demonstrated to be more effective than conventional exercise in patients with cognitive problems (e.g. Stroke, diabetes, etc…). But they are not suitable for frail patients and in-home applications.

Najafi, Patel, Armstrong (2017), Contemporary Diabetes (Series Ed.: A. Veves)
"Exercise Programs to Improve Quality of Life and Reduce Fall Risk in Diabetic Patients with Lower Extremity Disease"

iCAMP interdisciplinary Consortium on Advanced Motion Performance

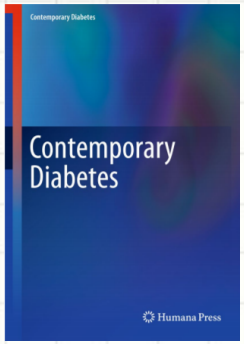
Baylor College of Medicine
MICHAEL E. DEBAKEY DEPARTMENT OF SURGERY

Balance Training
~ Conventional Methods

MATRIX POWER SUIT CO. LLC *US 8,443,465 B2*

❑Instrumental Exercises

Weight Shifting, Virtual Reality Walking,



- Recent advances in technologies open new doors for designing personalized and game-based exercise programs, which include both body and mind exercises. But they are expensive and unsuitable for home-based exercise programs

Najafi, Patel, Armstrong (2017), Contemporary Diabetes (Series Ed.: A. Veves)
"Exercise Programs to Improve Quality of Life and Reduce Fall Risk in Diabetic Patients with Lower Extremity Disease"

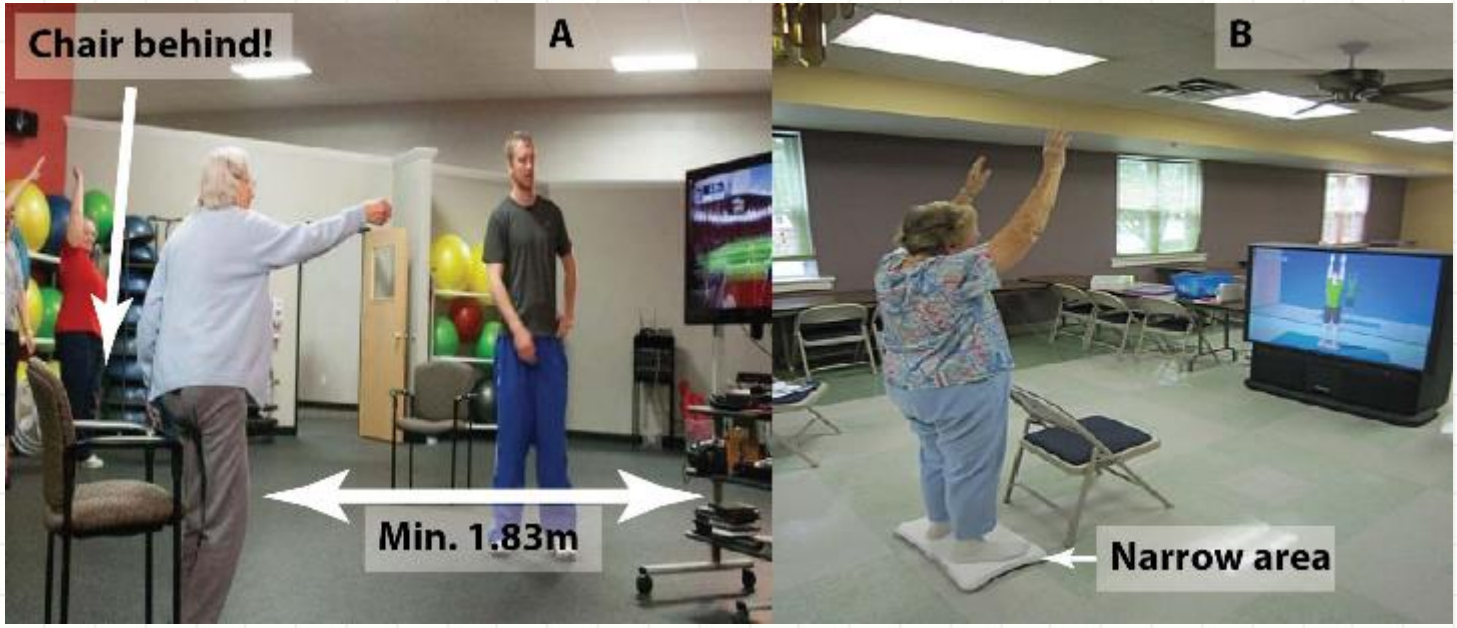
iCAMP Interdisciplinary Consortium on Advanced Motion Performance

Baylor College of Medicine
MICHAEL E. DEBAKEY DEPARTMENT OF SURGERY

New Horizon
~ Exergaming

MATRIX™
POWER SUIT CO. LLC *US 8,443,465 B2*

- ❑ Entertainment & Engagement
- ❑ Perception of motor-error
- ❑ Motor-Cognitive Exercise
- ❑ Personalized Exercise – Game Level



Conventional game-system may not be safe for frail patients

iCAMP Interdisciplinary Consortium on Advanced Motion Performance

Baylor College of Medicine
MICHAEL E. DEBAKEY DEPARTMENT OF SURGERY

Sensor-based (wearable) balance training could be the future of home-based personalized exercise programs

MATRIX™
POWER SUIT CO. LLC *US 8,443,465 B2*

Gerontology

Regenerative and Technological Section / Original Paper

Gerontology
DOI: 10.1159/000371846

Received: August 18, 2014
Accepted: January 5, 2015
Published online: February 19, 2015

Sensor-Based Interactive Balance Training with Visual Joint Movement Feedback for Improving Postural Stability in Diabetics with Peripheral Neuropathy: A Randomized Controlled Trial

Gurtej Singh Grewal[a, b] Michael Schwenk[a, b] Jacqueline Lee-Eng[a, b]
Saman Parvaneh[a, b] Manish Bharara[b] Robert A. Menzies[c] Talal K. Talal[c]
David G. Armstrong[b] Bijan Najafi[a, b]

[a]Interdisciplinary Consortium on Advanced Motion Performance (iCAMP), and [b]Southern Arizona Limb Salvage Alliance (SALSA), Department of Surgery, College of Medicine, University of Arizona, Tucson, Ariz., USA; [c]Hamad Medical Co., Doha, Qatar

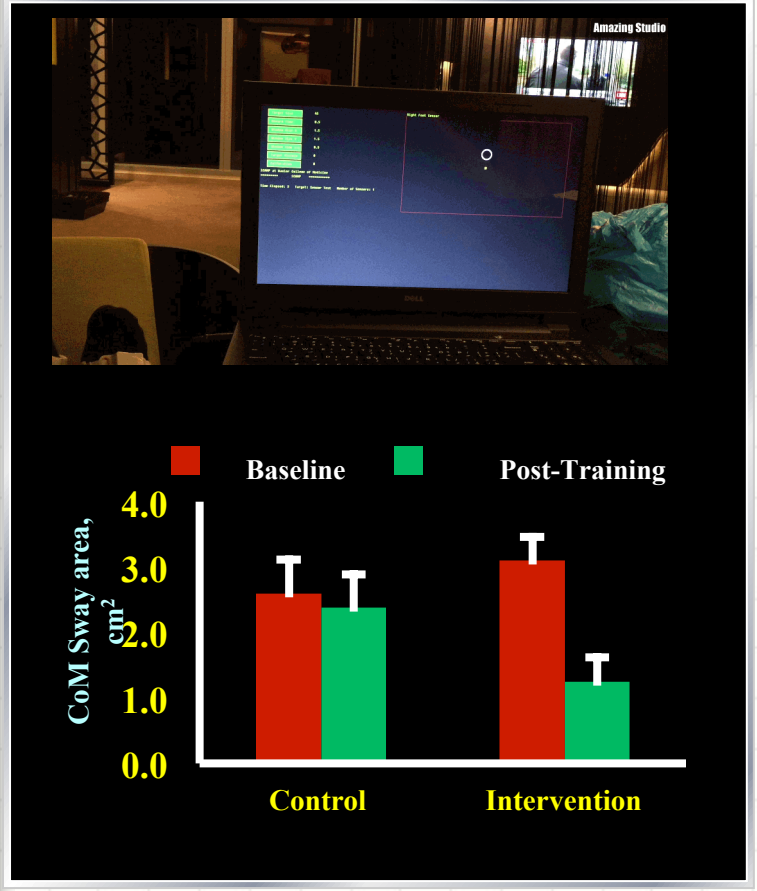
iCAMP interdisciplinary Consortium on Advanced Motion Performance

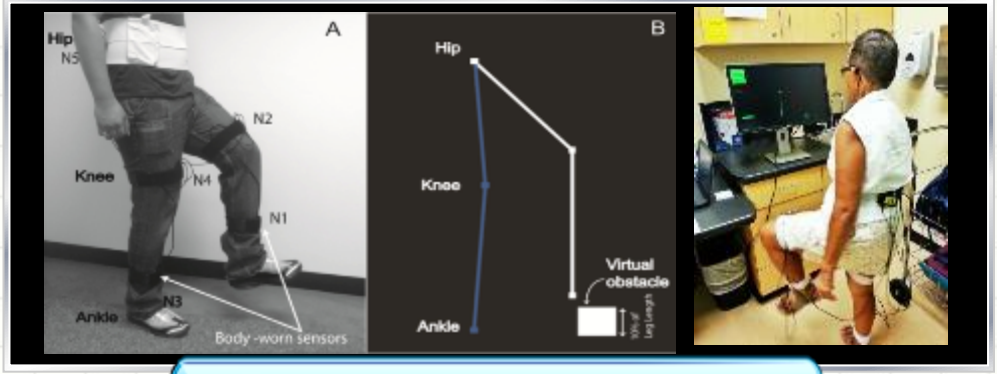
Baylor College of Medicine
MICHAEL E. DEBAKEY DEPARTMENT OF SURGERY

Using game-based exercise to improve motor-cognitive performance

MATRIX™ POWER SUIT CO. LLC *US 8,443,465 B2*

Game-based foot and ankle exercise programs are effective to improve balance in people with diabetes





Patient Testimony

Grewal , …, Najafi (2015), Gerontology

Baylor College of Medicine

iCAMP interdisciplinary Consortium on Advanced Motion Performance

MICHAEL E. DEBAKEY DEPARTMENT OF SURGERY

Filling the gap by Matrixx Wearable Wellness Technology

MATRIXX™
POWER SUIT CO. LLC *US 8,443,465 B2*

- While recent advances in wearable and gamification have opened new avenues to deliver body and mind exercise, they lack an important exercise component: **Resistive-Exercise**
- **Matrixx technology** could be used in verities of game-based exercise to magnify benefit of these interactive and personalized balance training interventions for in-hospital, in-clinic, and in-home body and mind exercises

***Ongoing study at the Baylor College of Medicine, Houston, Texas*

iCAMP Interdisciplinary Consortium on Advanced Motion Performance

Baylor College of Medicine
MICHAEL E. DEBAKEY DEPARTMENT OF SURGERY

The Matrixx Founders

POWER SUIT CO. LLC *US 8,443,465 B2*

Calvin Stewart

CEO/Founder

Cell #347-334-2642

Calvin@TheMatrixxPowerSuit.com

Holly Taylor

Co-Founder/

Design Director

Cell #347-334-2384

Holly@TheMatrixxPowerSuit.com

The Matrixx Power Suit Company, LLC

3121 29th Street Suite 3G Astoria, NY 11106

www.TheMatrixxPowerSuit.com

Office #347-242-2990