2006

Fujita Health University Rehabilitation Organization

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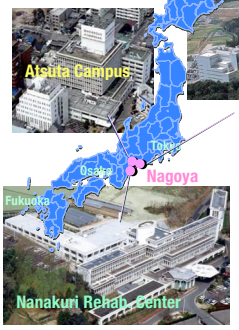
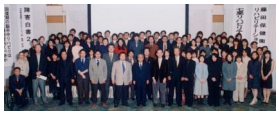
http://www.fujita-hu.ac.jp/~rehabmed/index.html

Fujita Health University Rehabilitation Organization

FHU is established in 1964





- Dept Rehab Med, School Med
- Faculity Rehab, School Health Sci
- Academy Rehab
- Dept Rehab, Univ Hospital
- Dept Rehab, Bantane Hospital
- Nanakuri Rehab Center
- Society Rehab & Kinesiology

Fujita Health Univ Rehab Organization & Department of Rehabilitation Medicine

Fujita Health Univ Rehab Organization

Department of Rehabilitation Medicine

Fujita Health Univ Rehab Organization

Membership: 188
MD: 39, PT: 64, OT: 52
ST: 10, Nrs: 9, Others: 14

Achievement in 2005
Patient No: new 3,174, total 123,720
PT&OT national exam pass rate: 100% (for 9 years)
Free-Paper/Lecture : 235, Paper/Book: 122
Host of conference: 1, Host of lecture: 14
Public research grant: 9, Press report: 4

http://www.fujita-hu.ac.jp/~rehabmed/index.html
E-mail: rehabmed@fujita-hu.ac.jp

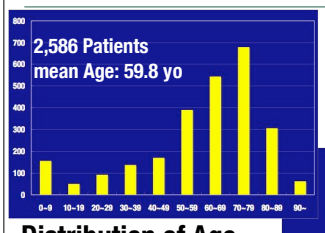
Overview of Rehab. Patients of University Hospital (2005, Toyoake)

(April 1 2005 ~ March 31 2006)

- Total New Patients: 2,586
- Inpatients / Outpatients: 2,102 / 484
- Age: 59.8 ± 21.9 yo (0~104, Med 65 yo)
- Gender: male 1,256 female 1,330
- Length of Stay: 60.2 ± 66.7 days

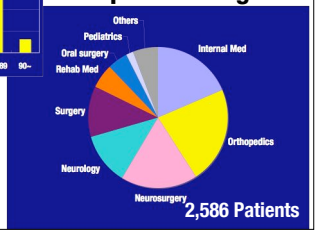
Overview of Rehab. Patients (2005)

University Hospital

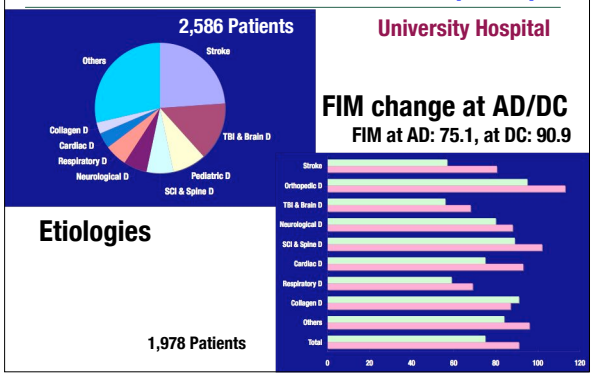


Distribution of Age

Depts in Charge



Overview of Rehab. Patients (2005)



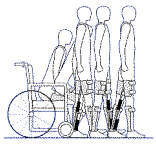
Major Research Projects of FHU-R

- WPAL project: Reconstruction of Paraplegic Locomotion
- HOW project: a new AFO (APS-AFO) Development
- Tomy project: Integrated Treadmill Gait Analysis
- FIT project: Integrated Stroke Rehabilitation Program
- COSPIRE project: Clinical Oriented Education System
- Clover project: Unified Database for FHU-R
- Phi project: Multidimensional Dysphagia Research

Atsuta Campus | Nanakuri Rehab. Center | Toyoake Campus

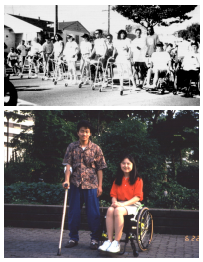
Primewalk - WPAL project

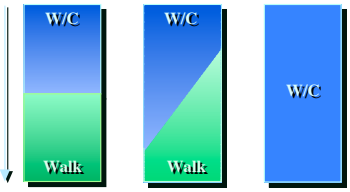
Reconstruction of Paraplegic Locomotion



Reconstruction of Paraplegic Locomotion

W/C usage should continue forever?





Futures of locomotive function

PrimeWalk system

Developing a modified Medial Single Hip (MSH) Joint System with Tims Co. Ltd.

- Compatible with W/C usage
- Less constraint by trunk-free
- Good standing balance by MSH
- Better gait function by virtual hip axis

Saitoh E et al. 2000

Powering Primewalk

with FES, Motor, & Motor-FES Hybrids

FES Hybrid
Saitoh et al. 1994

Motor Hybrid
Saitoh et al. 2000

Motor-FES Hybrid
Uno et al. 2002

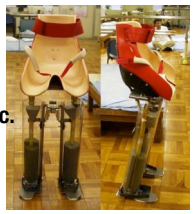
Powering with Control

Developing Robot

WPAL project

Wearable Power-Assist Locomotor

start at 2005



- Fujita H. Univ.
- Toyohashi Univ.Tec.
- Aska Co. Ltd.
- Tims Co. Ltd.

WPAL project in 2005

Robbot + Orthosis

Wearable Power-Assist Locomotor

Getting 3,000,000 $ for 3 years from the NEDO

Medial System

•Fujita H. Univ.
•Toyohashi Univ.Tec.
•Aska Co. Ltd.
•Tims Co. Ltd.

Development of Actuator System

Achievement of Convenient Standing-up & Walking

Treadmill Gait Analysis

Motion Analysis

Computer Simulation

Development of Learning System

Development of Training System

Development of Sensor & Control System

User Commitment

2 Paraplegic Physiatrists and Many Rehab Patients

HOW project

(Hemiplegic Orthotic Walking)

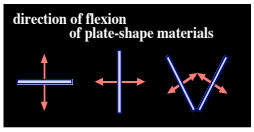
a new AFO Development

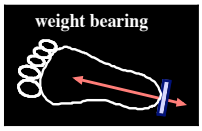
(the Adjustable Posterior Strut AFO)

Shape of Shoehorn AFO & Misdirection of Movement

not flex but twist

- Along with calf
- Make rigidity
- Problem of motion direction

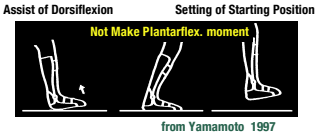




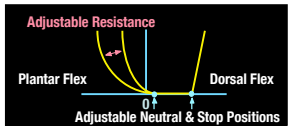
Developing an Adjustable Posterior Strut AFO: APS-AFO

• Guide for movement by Posterior Strut

Assist of Dorsiflexion Setting of Starting Position



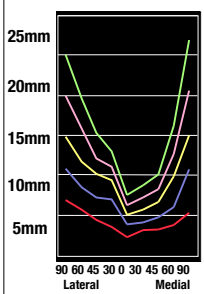
from Yamamoto 1997



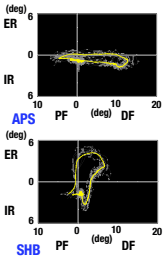
• Adjustable by a simple joint

Effect of APS-AFO

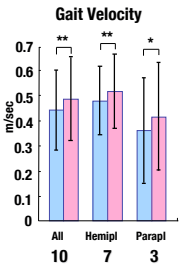
Mizuno et al. 2004



APS-AFO



Case: 48yo, male, Infarction, Lt-hemiplegia, TAO: 1Y4M

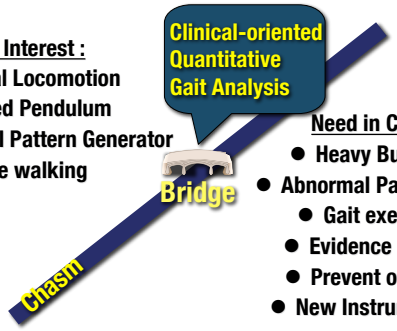


Tomy project
Integrated Treadmill Gait Analysis

Tomy Project for Gait Analysis

Research Interest :
- Bipedal Locomotion
- Inverted Pendulum
- Central Pattern Generator
- Passive walking

etc.



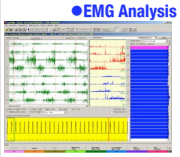
Need in Clinic:
- Heavy Burden
- Abnormal Pattern
- Gait exercise
- Evidence of Tx
- Prevent of Fall
- New Instrument

etc.

Integrated Treadmill Gait Analytic (ITGA) System

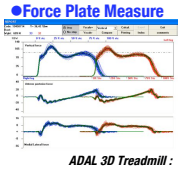
by FHU-R Tomy Project since 2000

●EMG Analysis



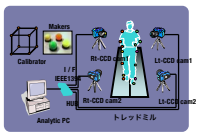
Gait Analytic EMG : under development with Nihon Kohden Co. Ltd.

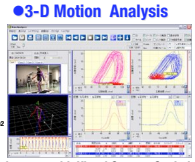
●Force Plate Measure



ADAL 3D Treadmill : Techmachine Co. Ltd.

●3-D Motion Analysis

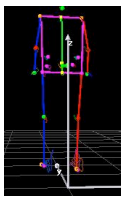


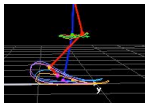


Kinema Tracer : under development with Kissei Comtec Co. Ltd.

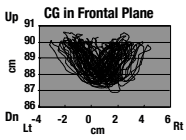
Expression using Lissajous's Figure

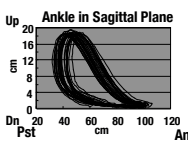
a healthy subject



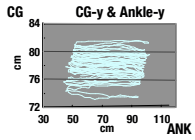


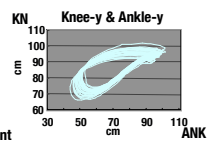
1 variables





2 variables





Ohtsula et al. 2003

ITGA assists clinical decision

• **Learning Index** (variation index)

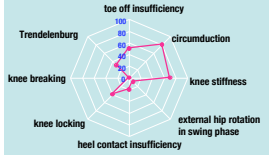
Evaluation of restorative process of gait ability by quantification of unevenness in movement

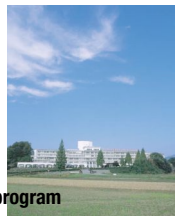
Lissajous		start	2w	4w	8w
C/G	frontal pl.	20.4	14.2	6.1	2.8
Rt knee	sagittal pl.	13.6	6.4	3.3	2.1
Lt knee	sagittal pl.	32.3	24.3	12.1	8.8
Rt heel	sagittal pl.	6.6	2.4	1.4	1.0
Lt heel	sagittal pl.	15.3	12.3	3.1	3.1
Rt heel	horizontal pl.	4.6	6.4	1.3	1.1
Lt heel	horizontal pl.	24.3	8.3	3.2	8.0
Average	Rt	9.6	4.7	2.3	1.6
	Lt	26.1	17.3	7.6	7.1

Change in Coefficient of Variance

• **Abnormality Index**

Quantified assessment of gait pattern abnormality





FIT project

Full-time Integrated Treatment program named by Prof. Palmer

Integrated Stroke Rehabilitation Program

at Fujita Health University Nanakuri Hospital

Weak Points of Rehab Approach

- Learning requires More Time
- Learning requires
  Active Participation
  of Patient and Family
- Teamwork requires
  Much Informational Cost

Framework of FIT program

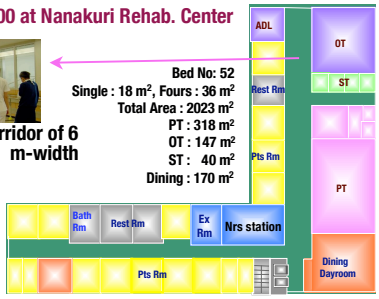
- to increase exercise dose
  - Ward gymnization: an integration of ward and gymnasium
  - Triangle-pairs (TriP) : a new therapist team system for everyday therapy
- to encourage motivation of patient and family
  - Activity-affordable corridor
  - Weekly stroke class
- to enrich the communication among staff
  - LAN-based online database system

a New Rehab. Unit for the FIT program

Started from Dec. 2000 at Nanakuri Rehab. Center

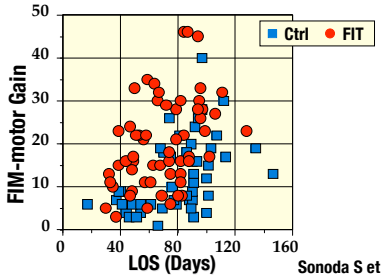
Activity-affordable corridor of 6 m-width

Bed No: 52
Single : 18 m², Fours : 36 m²
Total Area : 2023 m²
PT : 318 m²
OT : 147 m²
ST : 40 m²
Dining : 170 m²



Ward gymnization: an integration of ward and gymnasium

FIM-motor gain and LOS



Sonoda S et al. 2003

LOS (days)	Ctrl: 80	FIT: 70	P<0.05
FIM-gain	Ctrl: 12.7	FIT: 20.3	P<0.001
FIM-efficiency	Ctrl: 0.16	FIT: 0.30	P<0.001

COSPIRE project

Clinical Oriented Education System

the Clinical-Oriented System for Progression & Innovation of Rehabilitation Education

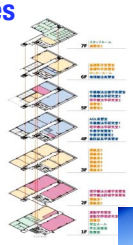
COSPIRE project

Clinical-Oriented System for Progression & Innovation of Rehabilitation Education

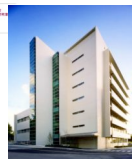
(co:with, spire:respiration; mutual inspiration)

- Integration of Clinic, Education, & Research
- Fruitful Reproduction of Rehab. Specialists
- Disposition Mixture of Clinician, Teacher, & Scientist
- Promotion of Integrated Clinical Research
- Promotion of Postgraduate Education
- Co-education of physician & therapist
- Utilize an advantage of the FHU-R

Open a New Faculty of Rehabilitation in School of Health Sciences for the COSPIRE project



6,000 m²
7 floors

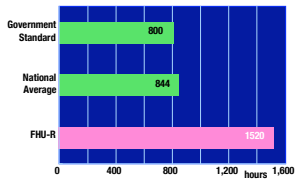


Start at Spring 2004 PT: 45, OT: 35

Enhanced Clinical Training

- 1,520-hours, about 2 times more than average
- 2/3 of program carried in FHU-R
- First-class clinicians as teachers

Professor Sawa S, OTR



First-class clinicians participate in empathy with the COSPIRE

Professor Tomita M, RPT

Clover project

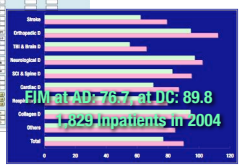
the Unified Database for FHU-R
quantified prognostication by using data-base

the Unified Database for FHU-R

Clover project

Used in conferences

FIM examination



Phi project

Multidimensional Dysphagia Research

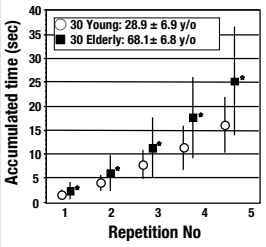
Multidimensional Dysphagia Researches

- Repetitive Saliva Swallowing Test (RSST) (Oguchi et al. 2000) & Non-VF Flow Chart (Baba et al. 2001)
- Clinical application of the Process Model (Shibata et al. 2003-)
- FES for the Bulbar Palsy (Kagaya et al. 2004-)
- Reconsideration about Positional Effect (Okada et al. 2005)
- Outcome of the Bulbar Palsy (Ozeki et al. 2005-)

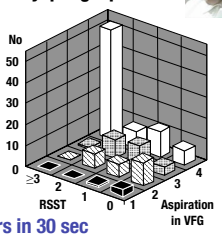
Repetitive Saliva Swallowing Test (RSST)

(Oguchi et al. 2000)

Normal data



Dysphagic patients



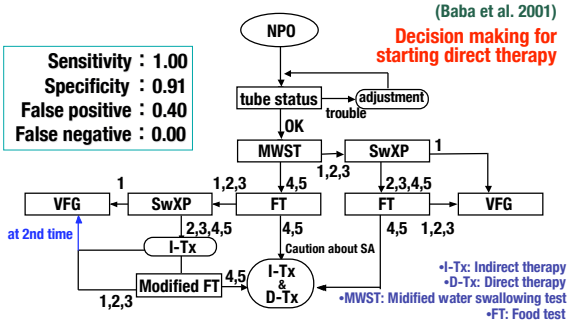
- Counting dry swallow numbers in 30 sec
- Becoming a standard screening test in Japan

Non-VF Flow Chart

(Baba et al. 2001)

Decision making for starting direct therapy

Sensitivity：1.00
Specificity：0.91
False positive：0.40
False negative：0.00



- I-Tx: Indirect therapy
- D-Tx: Direct therapy
- MWST: Midified water swallowing test
- FT: Food test
- SwXP: Swallowing X-P test
- VFG: Videofluorography

Join with Professor Palmer

Joint Conference on Dysphagia Rehabilitation,
co-sponsored by the Johns Hopkins University and Fujita Health University

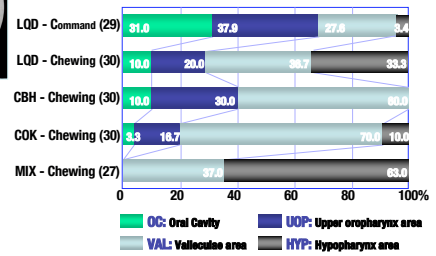
- 1996 Oct: NISAH in Nagoya
- 1998 Aug: 1st Joint Conference at JHU
- 2000 Feb: 2nd Joint Conference at JHU
- 2000 Sep: 6th JSDR in Kurashiki
- 2001 Apr: 3rd Joint Conference at JHU
- 2003 Oct: 4th Joint Conference at FHU
- 2004 Sep: 10th JSDR in Niigata & 5th Joint Conference at FHU
- 2005 Aug: 6th Joint Conference at JHU

Clinical application of the Process Model

(Shibata et al. 2003)

MIX - Chewing (ex. female, 31 years)

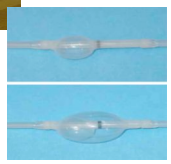
Location of leading edge of bolus at swallow onset

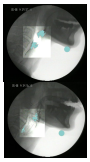


Products for Dysphagia Rehabilitation

Jelly for dysphagic patients (2005)

Swallow Cup (2002)





Balloon catheter (2003)

Adjustable chair for VFG (2001)