

J&P Robotics

Innovation & Authenticity

Dr. Kim, a physiatrist, doctor of medical engineering, and the director of Leaders Hospital, melted his lifelong philosophy into his robots. The robots were designed based on his 10–years–long medical expertise and principles he practice in real treatment settings.



Evidence based
function



Medical expert
developer



Novelty

Genuine Creativity

Initial Evaluation

Under evaluation mode, our robots are able to evaluate medical status of inpatients during initial visits and monitor treatment progress. This allows the doctors to prescribe the most appropriate treatment mode and adjust treatment course appropriately based on accurate evaluation.

Prescription

Based on evaluation results, patients can select recommended treatment programs or other treatment courses prescribed by a clinical professional.

Customized treatment

Before each treatment session, our robots are able to load patient's customized treatment schedule and wait for the patient to enter the care unit. This allows for consistent and continuous treatment.

Feedback

Our robots offer easy–to–read result screen and tracks progress for physicians, patients, and/or guardians to allow for active participation.

Tele–rehabilitation

Integrated Personal Management System enables Tele–rehabilitation through server, and prescription is available even if physician is monitoring remotely

Evidence based functionality

- ① Neuroplasticity: Human brains can recover their functionality and structure even after impairment, an ability widely known as neuroplasticity. To maximize the brain's natural healing and to foster new learning, repetition of specific movements is required.
- ② Sensory–motor Integration: Repetitive inculcation of normal sense can connect to normalization of motor ability
- ③ Neuro Development Technique (NDT): We employ treatment technique that is a part of current standard of care.
- ④ Leaders Robots are designed on the basis of medical expertise which is the core and foundation of rehabilitation treatment.



Medical Expert CEO

- ① Developer is an experienced physiatrist in practice for 20 years and the director of Leaders Hospital. His designs are based on his knowledge of the most needed core functions in any rehabilitation treatment. To develop high–tech rehabilitation medical equipment, he acquired doctor of medical engineering and is now creating the best rehabilitation robots for patients. He also oversees the entire commercialization process including product development, clinical trial, production, and marketing
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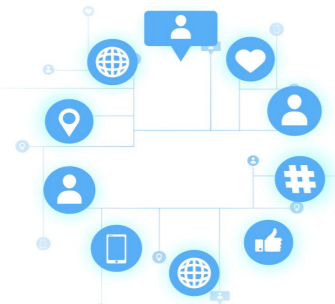
Evidence based functionality

- ① Our robots can carry out: functions desired by the patients, physicians, and the hospital staff.
- ② The treatment techniques are used as current standard of care in hospitals.
- ③ Each of our robots is specialized to focus on different functions, which can be used to treat patients of diverse conditions from various angles.
- ④ We offer One Stop Total Solution Package, a package program that offers a complete treatment routine involving a family of robots.
- ⑤ Through Integrated Personal Management System, we offer customized rehabilitation treatment plans for every patient.
- ⑥ Easily detachable, safe, and ergonomic design allows for patient use at home.




Future Area of Cloud Service

We aim to automate rehab facilities by offering a novel system consisting of patient-integrative management program and individual robot system at a reasonable price




- virtual storage
- Web-solution functionality
- MQTT protocol service for creation of IoT(Internet of Things) Service
- Firewall configuration for information security

Completion of Rehabilitation Care Unit Automation Package



LAN

Integrated management program



- Athletic performance data acquisition by instrument
- Athletic performance data acquisition by patient
- Wi-Fi wireless data communications
- Data management and stats by patient
- Data transmission to OCS server

Seven kind of rehabilitation treatment robots



Alex Series


Philip Series

Junior Series

Justin Series


Jacob Series

Game Contents



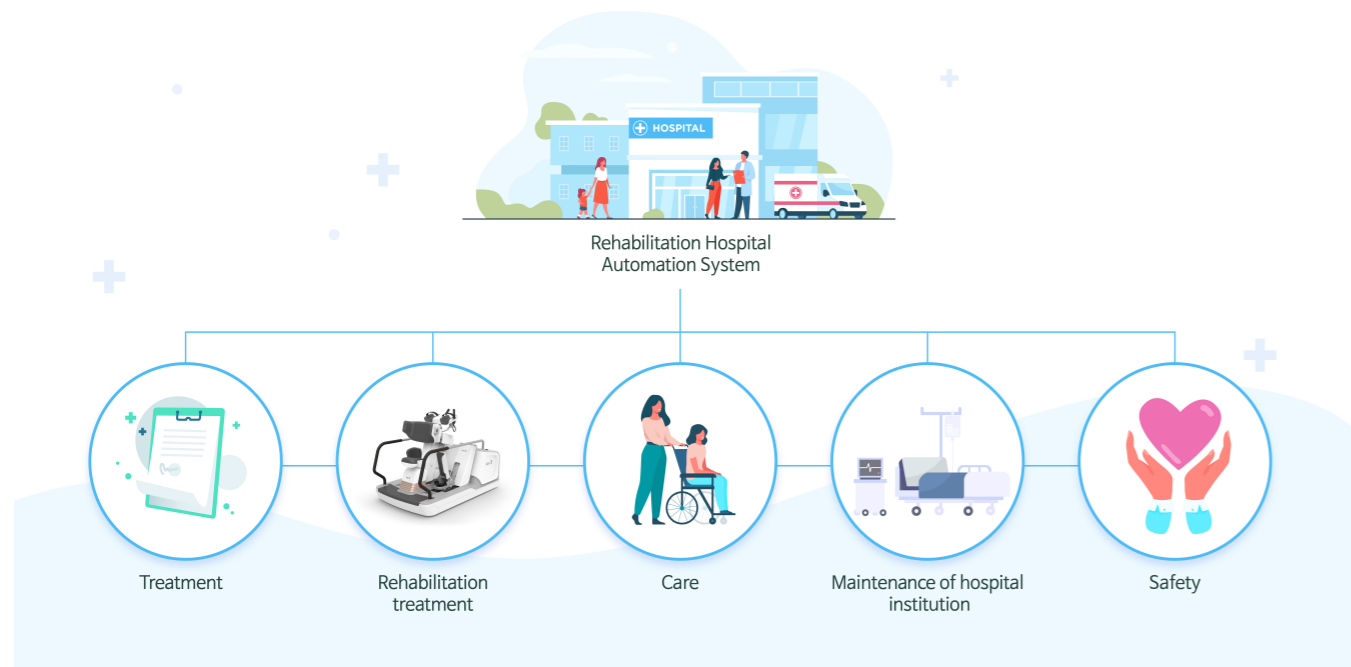
- facilitation of repetitive, dull training with fun games
- Game contents in accord with the purpose of rehabilitation
- Tailored treatments utilizing AR/VR

Integrated management service for patient



- Personal data and stats management
- Member management service
- Personal health service
- Work rate guidance
- Exercise method guidance

Hospital Automation System



To make your own automated rehab clinic

	Option 1	Option 2	Option 3	
trunk and L,E robot	Justin seies (2019. 3)	±	Jacob series (2020)	Jacob 1
gait robot		Alex seires (2020)	Alex 2 (2020)	
U.E robot	Phillip series (2019. 3)	±	Phillip series	Phillip 1
functional cognition robot		Schola series (2020)	Schola 2 (2020)	~200K USD
price	150K USD (except alex, scholar)	300K USD	~200K USD	~50K USD
	<ul style="list-style-type: none"> • University hospital • acute phase rehab • comprehensive rehab 	<ul style="list-style-type: none"> • University hospital • acute phase rehab • comprehensive rehab 	<ul style="list-style-type: none"> • nursing care unit • health care center • chronic phase 	<ul style="list-style-type: none"> • walking clinic

Superiority
of J & P
robotics

Features of Justin and Jacob



• Piggyback posture •

Patent-technology which realizes piggyback posture, easy don and doff, safe support, and snug fit.

Piggyback, a posture that has been used timelessly to carry ailing old people or children, is not only safe and comfortable but also symbolizes respect, admiration, and intimacy in the East.

Our paraplegia rehab robot enables functional rehabilitation treatment ensuring safe support and snug-fit based on this piggyback posture.

It also improves forward-weight transfer ability, which is the most important principle in rehabilitation treatment for paraplegic patients. It is an innovative solution to help with patient anxiety for falling forward.

Our robots focus on pre-gait training, an effective, evidence-based approach for treating paraplegia

What is pre-gait training?

Paraplegia rehabilitation treatment is divided into pre-gait training and gait training. Pre-gait training aims for strengthening motor power and improving the stability of soma and balancing. It progresses treatment in varying postures taken during mat activities, activities while sitting, sit-to-stand activities, activities while standing, and activities involving instruments such as a medical ball.

Pre-gait training shares equal, if not more importance, when compared to gait training in professional rehabilitation treatment. The competency of pre-gait training determines gait pattern, so we dedicate above 80% of our total paraplegia rehabilitation training sessions to pre-gait training.

Through pre-gait training, motor power, balancing, and weight transfer ability, weight bearing ability can be improved. These abilities are essential for gait training ultimately.



• Pre-gait training •

• gait training •

Not gait simulation, but gait training

Comparison between gait training and gait simulation

Provision	Gait training	Gait simulation
Purpose	<ul style="list-style-type: none"> Fundamental treatment for gait disabilities, training stance phase and swing phase gradually through gait algorithm segmentation Correction of gait pattern when abnormal 	<ul style="list-style-type: none"> Acquire senses through sensorimotor remodeling, operating normal gait pattern to patients passively. Unsuitable for gait therapy/ pattern correction.
Content	<ul style="list-style-type: none"> Focusing on alternative and reciprocal movement of weight transfer and bearing between affected side and unaffected side Focusing on active motion of affected side such as weight transfer and bearing Concentrating on obstacles of patient, targeting on insufficient parts directly 	<ul style="list-style-type: none"> Inputting normal gait pattern into patient passively, attaching patient's legs to dermoskeleton system or foot plate Focuses on only rhythmical gait motion, de-bearing weight Lacks active weight bearing and support
Feature	<ul style="list-style-type: none"> Direct curative effacement for weight bearing and transfer, focusing on improving ability of weight bearing, not let walk when affected side doesn't acquire weight bearing 	<ul style="list-style-type: none"> Lacks active requisite which is basis of rehabilitation treatment Lacks curative efficacy for weight bearing and transfer, which is the foundation of gait Lacks active correction of abnormal gait pattern
Actual treatment technique	<ul style="list-style-type: none"> Practical gait training in actual care unit 	<ul style="list-style-type: none"> Not an actual treatment technique

Gait simulation and gait training are completely different concepts as below. In actual rehabilitation care unit, we operate gait training, not gait simulation. Dr.Kim's paraplegia rehabilitation robots operate gait training properly.

Technical and medical differentiation with other products

Provision	Dr. Kim's Robot 'First Mover'	Competing product 'Fast Follower'
Purpose	<ul style="list-style-type: none"> Gait training correction of abnormal pattern 	<ul style="list-style-type: none"> Gait simulation
Content	<ul style="list-style-type: none"> Educate of alternative and reciprocal movement between affected side and unaffected side for weight transfer and bearing Focus on active motion of affected side such as weight transfer and bearing 	<ul style="list-style-type: none"> Focus on only rhythmical gait motion, de-bearing weight No active weight bearing and support
Feature	<ul style="list-style-type: none"> Educate weight bearing and transfer education of affected side Educate active movement 	<ul style="list-style-type: none"> Weight de-bearing Passive movement
Curative Efficacy	<ul style="list-style-type: none"> Realize practical gait training of actual care unit Conceptualize treatment algorithm and segment gait elements, enabling learning, performance, education (direct curative effacement) 	<ul style="list-style-type: none"> Lacks practical technique in actual care unit(No other forms of sensory impulse available with these robots)
Content composition	<ul style="list-style-type: none"> Organize each element of gait as educative and curative contents Reading the patient's medical status of disabilities available / customized prescription available / comprehending the patient's improvement available With hardware development, formation of contents is regarded as primary component of gait treatment, which is in charge of functionality of gait treatment 	<ul style="list-style-type: none"> Does not include softwares/ programs or only includes light contents for sensory impulse development

Differentiation from other products

Provision	Dr. Kim's Robot 'First Mover'	Competing product 'Fast Follower'
Role	<ul style="list-style-type: none"> Gait training / correction of abnormal pattern Replacing clinicians is ultimate goal for care unit automation 	<ul style="list-style-type: none"> Robot lacks the ability to effectively replace a clinician and serves only to supplement gait simulation
Price	<ul style="list-style-type: none"> Within tens of millions 	<ul style="list-style-type: none"> 300 ~ 500 million
Connection to automation	<ul style="list-style-type: none"> One of core rehabilitation robots which is connected to medical automation, hospital automation and cure unit automation 	<ul style="list-style-type: none"> Lacks automated robot family system
Market competitiveness	<ul style="list-style-type: none"> Include functions needed from market, as realize practical gait training in actual care unit The largest product competitiveness with available price for hospitals 	<ul style="list-style-type: none"> Too expensive system to clients Lacks gait simulation, which is what the medical market is currently looking for
Quality competitiveness	<ul style="list-style-type: none"> Easy to don and doff : treatment available for ~ 13 patients per day secures safe support for hemiplegic patients with paralyzed half 	<ul style="list-style-type: none"> don and doff takes ~ 20 -30 minutes, limiting patients per day to ~ 6 For hemiplegic patients, product is essentially not so different from trying to ride a bicycle while standing up

Competitiveness

Real therapeutic technique	sitting activity	sit to stand activity	standing activity	motor facilitation	gait training	price
Justin in Leaders robot	●	●	●	●	●	250k
A				●		40k
B					● (gait simulation)	200~300k
C	●					30k
A+B+C	●			●	●	270~370K

Justin

Justin is a neuro-rehabilitation robot for trunk and L.E. It provides easy don and doff with its snug and safe design. Justin is a self-functioning robot therapist modeled after real therapist activities, including evaluation, prescription, and execution of treatment.

Its Tx protocol is based on real therapeutic skills of the Neurodevelopmental technique providing customized rehab based on the severity of disability with passive, active, and resistive mode.

Justin has unique piggyback supporting system enabling comfortable suspension with its sole design. Its main part consists of upright bar and two respective L.E modules. Saddle and chest support moves along with the upright bar, providing safe and snug support. The upright bar is also doubled through the guiding pillar enabling 3-dimensional trunk movement. Also, both L.E modules provide motor facilitation mode and gait training mode. This is practically the same as real gait training in the clinic.

Justin adopts a real therapist's role on neuro-rehabilitation: evaluation of residual impairment, the formation of therapeutic plan based on the result, and execution of the therapeutic session.

Justin makes it possible to train trunk and lower extremity with one system. Justin enables 3-dimensional training of the trunk both on sitting and standing posture and facilitate the motor recovery of the paralytic lower extremity and simulates gait cycle by gait training.



Features

Detachable structure considering patient's medical features: Piggyback posture (Snug fit)

- Attachment is completed with only getting in wheelchair
- Safe and comfortable support through piggyback posture
- Supporter has double effect as a center structure of rehabilitation training

Combined with actual treatment technique

- Both of pre-gait training and gait training are available simultaneously

Motivate patients through game contents

- Difficulty control is available according to the medical status of patients

evaluation of patient's medical status is available through evaluation mode

Analysis of treatment result and data are offered

Integrated management system is connected - one to one customized prescription of rehabilitation treatment

Jacob

Jacob is a neuro-rehabilitation robot for trunk and L.E. It Provides easy don and doff with its snug and safe design . Jacob is a self -functioning robot therapist modeled after real therapist activities , including evaluation, prescription, and execution of treatment.

Its Tx protocol is based on real therapeutic skills of the Neurodevelopmental technique providing customized rehab based on the severity of disability with passive, active, and resistive mode.

Jacob has unique piggyback supporting system enabling comfortable suspension with its sole design. Its main part consists of upright bar and two respective L.E modules. Saddle and chest support moves along with the upright bar, providing safe and snug support. The upright bar is also doubled through the guiding pillar enabling 3-dimensional trunk movement. Also, both L.E modules provide motor facilitation mode and gait training mode. This is practically the same as real gait training in the clinic.

Jacob adopts a real therapist's role on neuro-rehabilitation: evaluation of residual impairment, the formation of therapeutic plan based on the result, and execution of the therapeutic session.

Jacob makes it possible to train trunk and lower extremity with one system. Justin enables 3-dimensional training of the trunk both on sitting and standing posture and facilitate the motor recovery of the paralytic lower extremity and simulates gait cycle by gait training.



Features

Detachable structure considering patient's medical features: Piggyback posture (Snug fit)

Attachment is completed with only getting in wheelchair

Safe and comfortable support through piggyback posture

Supporter has double effect as a center structure of rehabilitation training

Adjusting standing degree and front inclination based on patient's status.

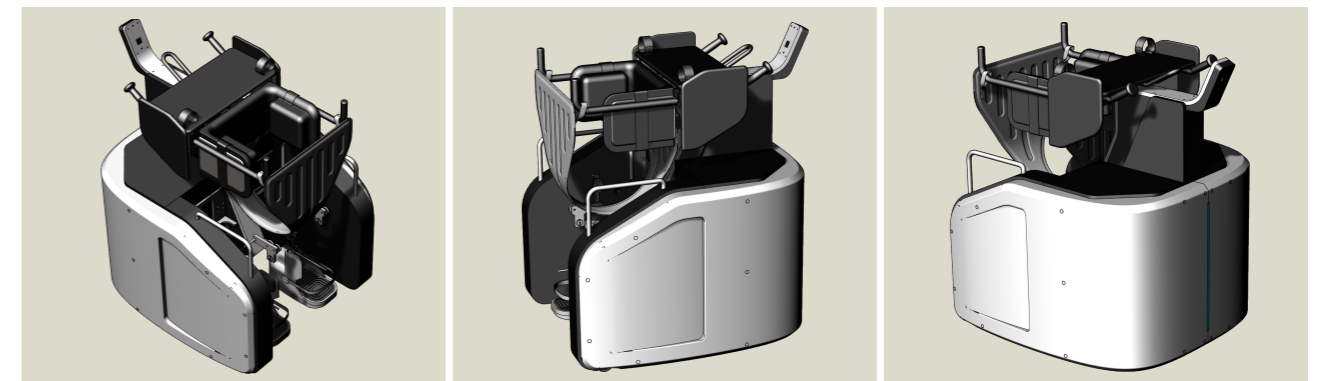
It is possible to conduct simple treatment simultaneously by installing lap board on the upper section.

It is possible to conduct more in-depth rehabilitation medical treatment(Jacob 2, 3 series) by mounting lower limb muscle strengthening module, balance training module and walking module as necessary.

Alex

Alex supports both of pre-gait training and gait training, and is one of paraplegia rehabilitation robots that reads medical characteristics of paraplegic patient caused by stroke(traumatic brain injury) ergonomically.

Gait training with practical movement on floor of care unit is available – focus on gait training for the middle and latter period patients and double the effects of gait training with AR (Augmented Reality) technology



Curative Efficement

- The Releasing rigidity of truncus and limbs, increase of range of motion
- Strengthening muscle of soma
- Strengthening static and kinetic stability of soma
- Strengthening muscle of affected side of lower body
- Improvement of weight transfer ability and support ability
- Strengthening circuit of sense-motor
- Promotion of neuroplasticity recovery

Features

Detachable structure considering patient's medical features: Piggyback posture (Snug fit)

Attachment is completed with only getting in wheelchair

Safe and comfortable support through piggyback posture

Combined with actual treatment technique

Gait training with practical movement on floor is available

Integrated management system is connected – one to one customized prescription of rehabilitation treatment

Junior series

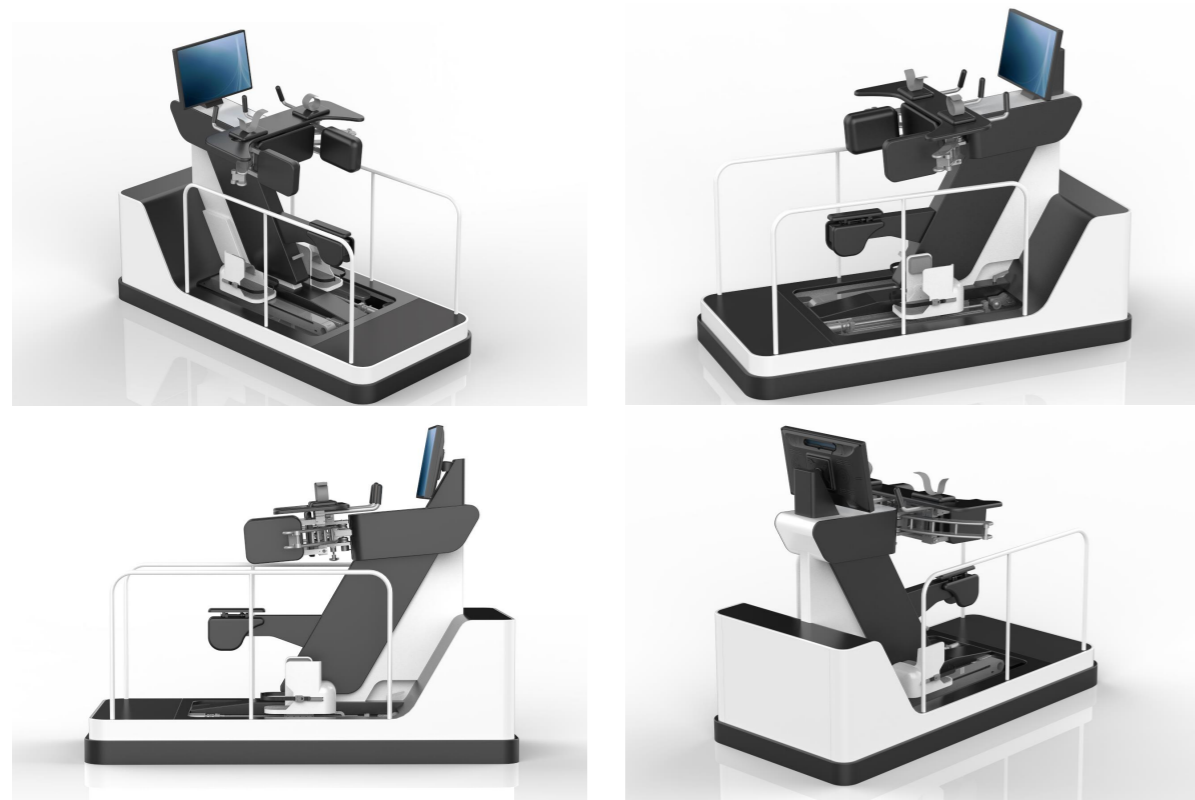
Junior is a basic model of neuro –rehabilitation robot for trunk and L.E., Junior provides active mode of trunk and lower extremity rehabilitation with one system, Junior is more tailored basic rehab system for subacute and chronic stage of rehab process.

Junior provides easy don and doff with its snug and safe design. Junior is a self–functioning robot therapist modeled after real therapist activities , including evaluation , prescription , and execution of treatment.

Its Tx protocol is based on real therapeutic skills of the Neurodevelopmental technique providing customized rehab based on the severity of disability with passive , active , and resistive mode.

Like Justin and Jacob, Junior has unique piggyback supporting system enabling comfortable suspension with its sole design. Its main part consists of upright bar and two respective L,E modules. Saddle and chest support moves along with the upright bar, providing safe and sung support . The upright bar is also doubled through the guiding pillar enabling 3–dimensional trunk movement. Also, both L,E modules provide motor facilitation mode and gait training mode. This is practically the same as real gait training in the clinic.

Junior 2 is home based rehab device for individual use at home. It provides basic rehab program with very affordable price range.



Philip 1

Philip 1 supports both of pre–gait training and gait training , and is one of upper limbs rehabilitation robots that reads medical characteristics of upper limb paralysis patient caused by stroke(traumatic brain injury) ergonomically.

Curative Effacement

- Strengthening circuit of sense–motor
- Promotion of neuroplasticity recovery
- Strengthening muscle of upper limbs and improving muscle controlling ability ability



Features

Detachable structure considering patient’s medical features

- Attachment is completed with only wearing below elbow of upper limbs; comfortable and safe support
- Supporter has double effect as a center structure of rehabilitation training

Treatment for patients in varying clinical status is available, combined with actual treatment technique

- passively, actively support. Training mode of active–resistant

Motivate patients through game contents

- Difficulty control is available according to the medical status of patients

Motivating patients by using game contents

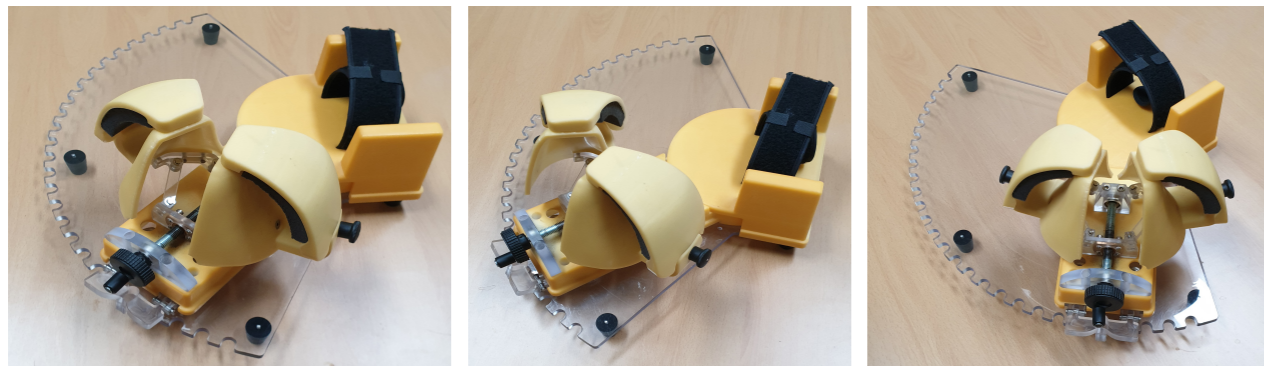
- Controlling difficulty based on patients’ condition
- It enables evaluation on patient’s clinical status due to mounting evaluation mode
- Analysis on medical treatment result and providing the data
- Connected to patient integration management system
 - One–to–one customized prescription for rehabilitation medical treatment

Rehabilitation mode accorded with patient’s medical status

Patient’s medical status	Upper limbs: Motion not available Hands: Motion not available	Upper limbs: Motion available Hands: Motion not available	Upper limbs: Motion available hands: Motion available
Mode	Passive mode	Supported active mode	Active–resistant mode

Philip 2

Philip 2 is an upper limbs rehabilitation robot that reads medical characteristics of patient ergonomically and is combined with actual treatment technique for effective treatment of upper limbs paralysis and stiff caused by stroke(traumatic brain injury).



Curative Efficacy

- Patient or guardians can use by themselves without support from professional clinicians.
- Joint working range increases for joint contracture patients
- Effect of reducing stiffness for stiff patients
- Functions of upper limbs are improved for patients with upper limbs disabilities
- Especially, it can double the effect of rehabilitation treatment by preparedness improvement of active movement and economy of stretching time when used for warming-up exercise

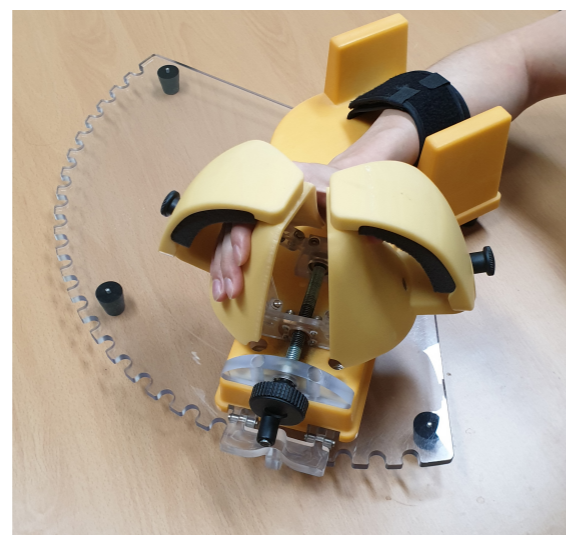
Features

Detachable structure considering patient's medical features: Patients who have high stiffness can wear within one minute by oneself

Combined with actual treatment technique

- Gradual stretching of wrists and fingers
- Use golgi tendon reflex with soft and low tempo stretching

Patent structure which stretch whole fingers effectively even though there are difference among length of fingers



Evidence based functionality

Most commonly observed problems	Activities in physical therapy	Robotic rehabilitation in Justin
Sitting		

Leaders hospital has been operating Robot Rehab.

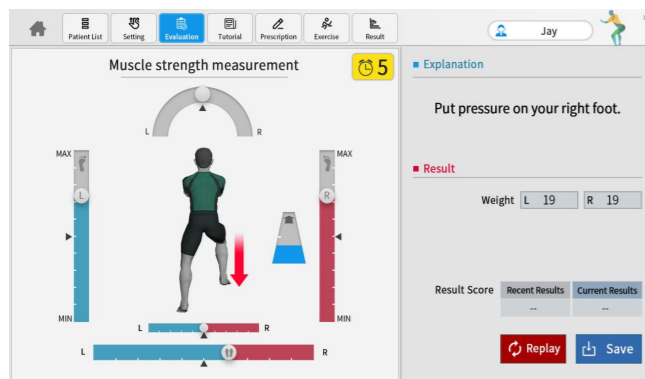
Most commonly observed problems	Activities in physical therapy	Robotic rehabilitation in Justin
Standing & Walking		
		
		
		



Exercise and Evaluation Examples

evaluation

evaluation result



therapeutic exercise-1

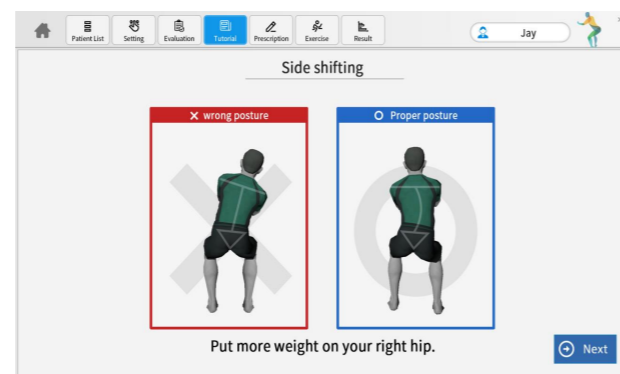
therapeutic exercise-2



prescription

tutorial mode

Category	Result	Training	Mode	Game 1	Game 2
A-1. Side shifting	50/100	Normal	S.set	Normal	S.set
A-2. Centering	50/100	Normal	S.set	Normal	S.set
A-3. Tilting	50/100	Normal	S.set	Normal	S.set
A-4. Rotation	50/100	Normal	S.set	Normal	S.set
A-5. Forward backward	50/100	Normal	S.set	Normal	S.set
B. STS- Passive	50/100	Normal	S.set	Normal	S.set
B. STS- Active Assistant	50/100	Normal	S.set	Normal	S.set
B. STS- Active	50/100	Normal	S.set	Normal	S.set
C-1. Side shifting	50/100	Normal	S.set	Normal	S.set
C-2. Centering	50/100	Normal	S.set	Normal	S.set
C-4. Tilting	50/100	Normal	S.set	Normal	S.set
C-5. Rotation	50/100	Normal	S.set	Normal	S.set
C-5. Forward backward	50/100	Normal	S.set	Normal	S.set



therapeutic exercise-3

performance data

