

Non-contact and non-constraint

Neonatal respiratory data collection systems

Gently Watch Precious Lives



Basic Medical Research Systems

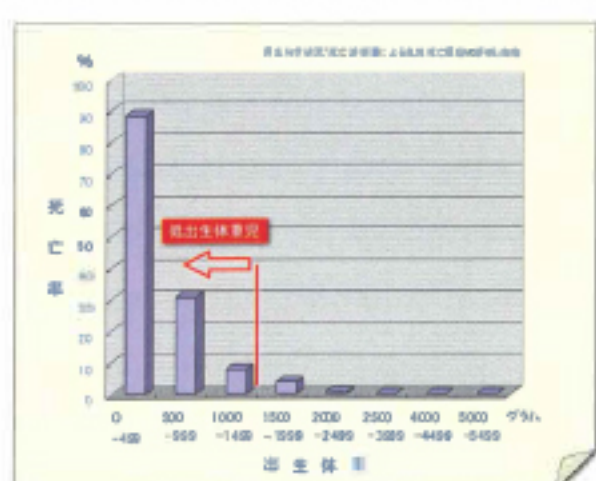
Basic Medical Research Systems

which endeavors to cope with decreasing birthrate and aging population by protecting the lives of infants and the elderly. We established to introduce respiration monitoring systems, posture discerning systems and swallowing function evaluation systems into the society by using non-contact 3 dimensional information acquiring technology developed by Nakajima laboratory at Keio University. Our products use university originated and world first technologies. We can detect minute movements which cannot be discerned by human vision of thorax and abdominal area from breathing and larynx area from swallowing food of infants and the elderly. We are a newly born startup company and determined to contribute to the society by our new systems.

The background and target of development

The number of new born babies in each year in Japan is approximately 1.1 million and in fiscal 2010, 9.6% of these babies weighed less than 2,500 grams, and classified as premature. Moreover, more than 8,000 babies had a weight of less than 1,500 grams which is classified as a very low weight. Premature babies have tendencies to develop diseases of the respiratory system and other functions and special attention has to be paid.

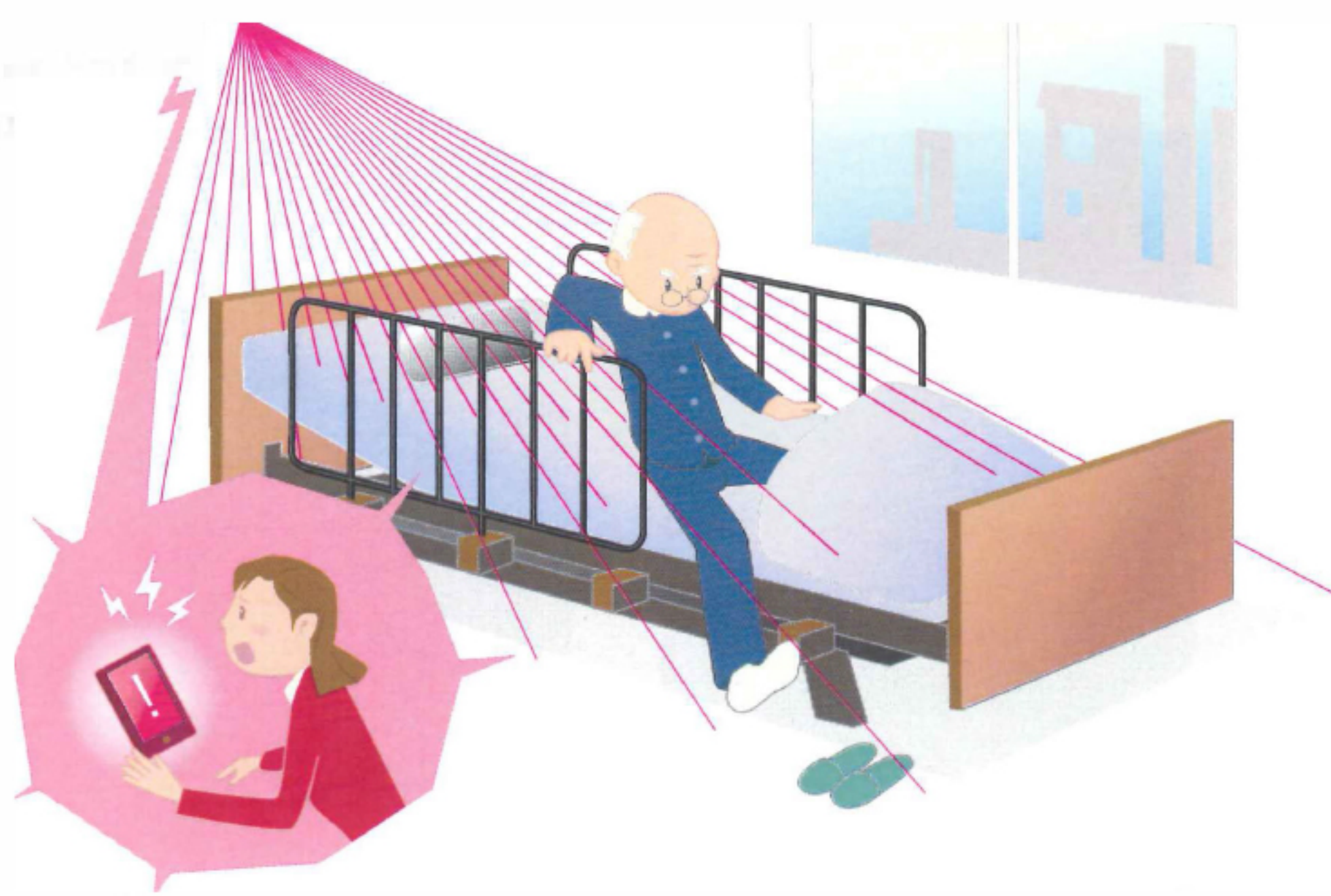
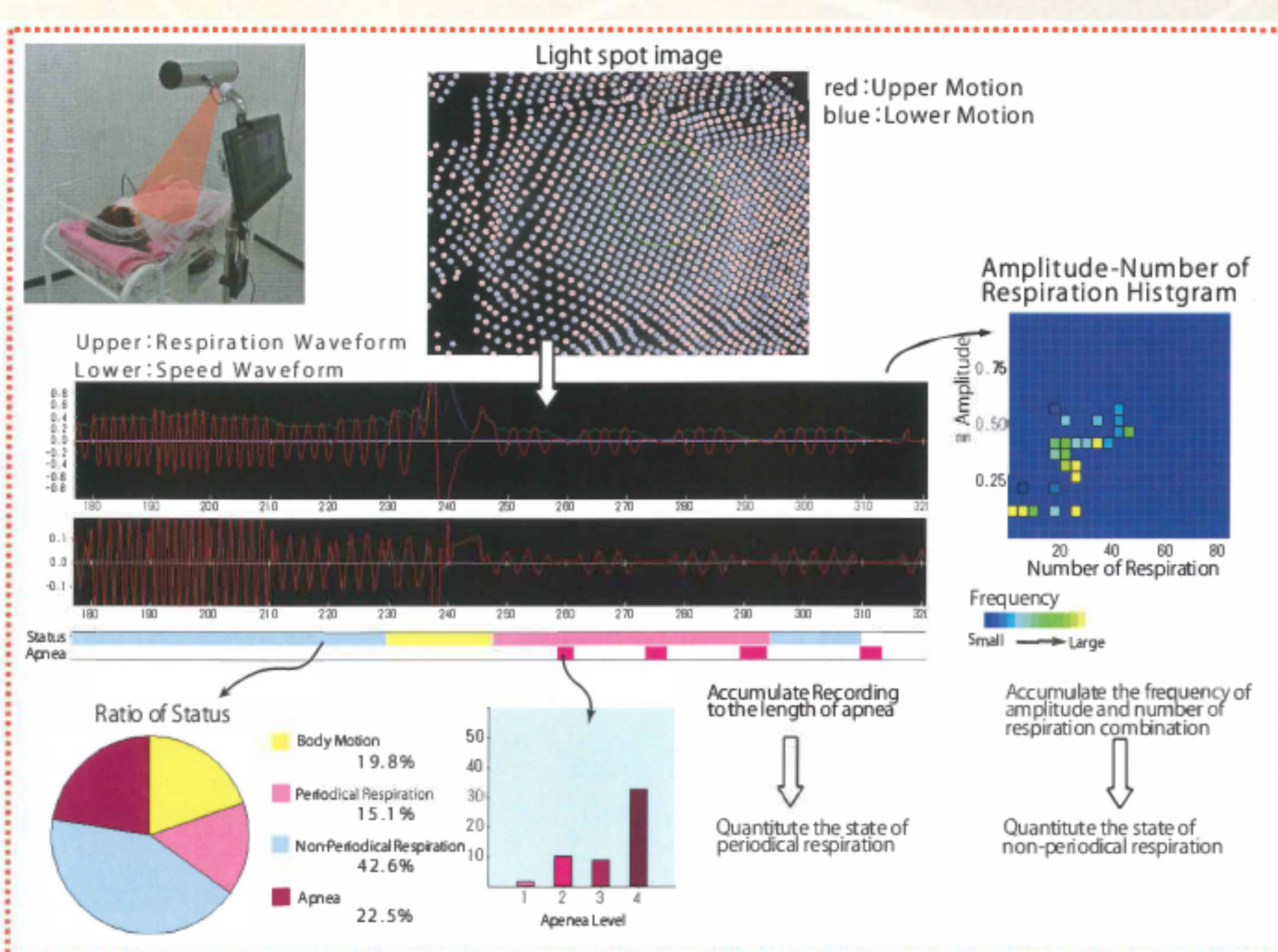
We are developing systems to evaluate neonates without contact and invasion. By evaluating periodical and non-periodical respiration functions, we will provide the evaluation scores of the respiratory capability of neonates. We target for these systems to be used as the follow-up systems in dedicated neonatal clinical facilities.



[Warning]
As this system is for basic medical research unit, it cannot be used for diagnosis of patients.

Non-contact and non-constraint Neonatal respiratory data collection systems

These systems collect respiratory data from neonates for basic clinical studies without any contact and invasion to the patient. The system requires no contact to the patient to measure respiratory thorax movements. The system uses an Infra-Red (IR) laser and a laser beam splitter to illuminate the thorax of the patient with IR beams. A camera with a solid state sensor such as CCD collects the positions of the beams to determine the 3 dimensional position changes by triangulation. The data are averaged in all or in part to obtain respiratory waveforms (including number of respiration and amplitude). It is possible to gather and analyze the information regarding physical properties of the lungs, the development status of the central nervous systems, etc.



Bedside non-contact and non-constraint safety monitoring systems

Non-contact sensor watches people under care

It's a bed-side safety monitoring system which can detect large posture changes such as stand-ing up and leaning against a railing as well as minute movements such as struggling and shivering. and uses an Infra-Red sensor to monitor a patient without any contact and detects dangerous postures using artificial intelligence and notifies the condition to the caretaker.

Features of our System

- Our systems detect dangerous postures in just a few seconds and notifies the condition to the caretaker. Thus, the caretaker does not have to watch at the patient's bedside all the time. This will reduce the physical and emotional burden on the caretaker.
- The system projects Infra-Red (IR) beams on the bed and the light spots are captured by 2 IR sensors. Therefore, no contacts or constraints are necessary and the patient can carry out normal daily life.
- The monitoring area is the entire bed and possible danger can be detected no matter the patient is on the bed.
- The system uses IR cameras, but only IR light spots are recorded. Thus, the privacy of the patient is protected.

Examples of Conditions Reported

Leaving Bed



Standing



Leaning



The system discerns postures which may lead to leaving the bed or falling and reports alarming conditions such as "danger" and "check" through the user's terminal with a visible sign and sound.

Bedside non-contact and non-constraint monitoring systems

Setup and Installation Examples

■ Setup Example



■ Safety Monitoring App (Smartphone)



List Screen

In facilities where multiple sensors are used this view enables caretakers to check multiple people under care at a glance.

■ Main Unit



Detailed information display
Movements and state of one person under care can be checked in real time.



Major Specifications

External Dimensions and Weight		Width 1000 x Depth 100 x Height 70 (mm), Approximately 2.7 kg
User and Environmental Conditions	Applicable Bed Size	Width < 1000 x Length < 2000 (mm)
	Network	The main unit have to be able to connect to a smartphone by wireless LAN (Wi-Fi)
	Applicable Patients	Height: 100~200 cm, Weight: 35~120 kg
	Sensor Head Mounting Position	On the wall or ceiling, 1800~2500 mm above the head of the bed (from sheet on the bed, without a quilt)