

Observation of benefits arising from more natural forests, Japanese research

Hiroko Ochiai MD, PhD
National Tokyo Medical Center
INFOM, Japan

JAPAN

Japan is a small island state located in East Asia.



Japan is surrounded by **various climatic zones** because it is long from north to south. And **various forests** are formed according to the local climate.



There are **four seasons** in Japan. We can see the changing of forest according to the season, like cherry blossoms bloom in the spring, leaves change the color in the autumn, they are so beautiful.

As there are **a lot of mountains**, the difference of height also causes the variety of the forest.



Very **steep topography** and a lot of **rainfall**, so people have ruled forests to prevent natural disasters from a long time ago.



On the other hand, people have received a lot of advantage of the various benefits that forests produce by wisely protecting and raising them.

People felt **awe** and **respect** for the overwhelming power of the nature.



As evidence of their faith, many Japanese forests have **shrines**, and it is said that it is more difficult to find forests without shrines even today. And this deep spiritual connection makes us feel that mountains and forests are one of the homes of Japanese hearts and the roots of cultural wealth.



That's why

Japanese know well about forest and get along well with them.



Modern Japan

The population of Japan is approximately 130 million, and the 10% is concentrated in the capital Tokyo.



This is a famous Shibuya's crossing, during a rush, 3,000 people cross at one time.



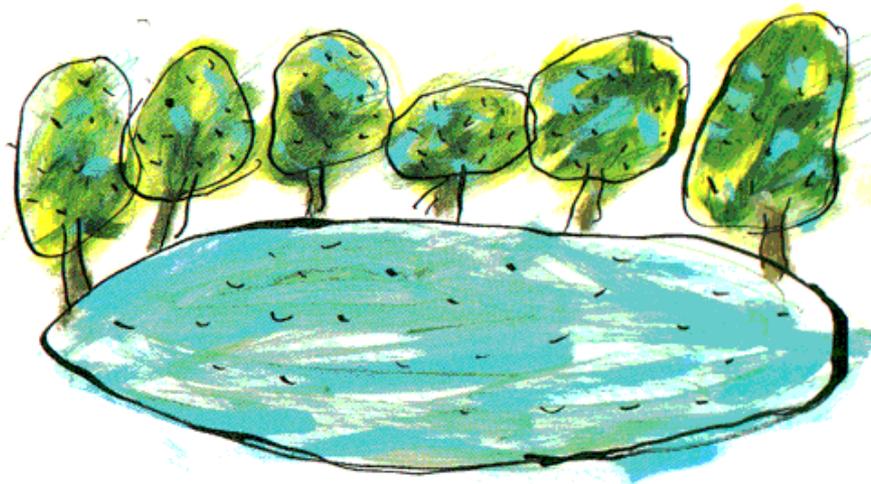
The commuting train at rushing hour in Tokyo is awful.

That's why many people in Tokyo are stressful.

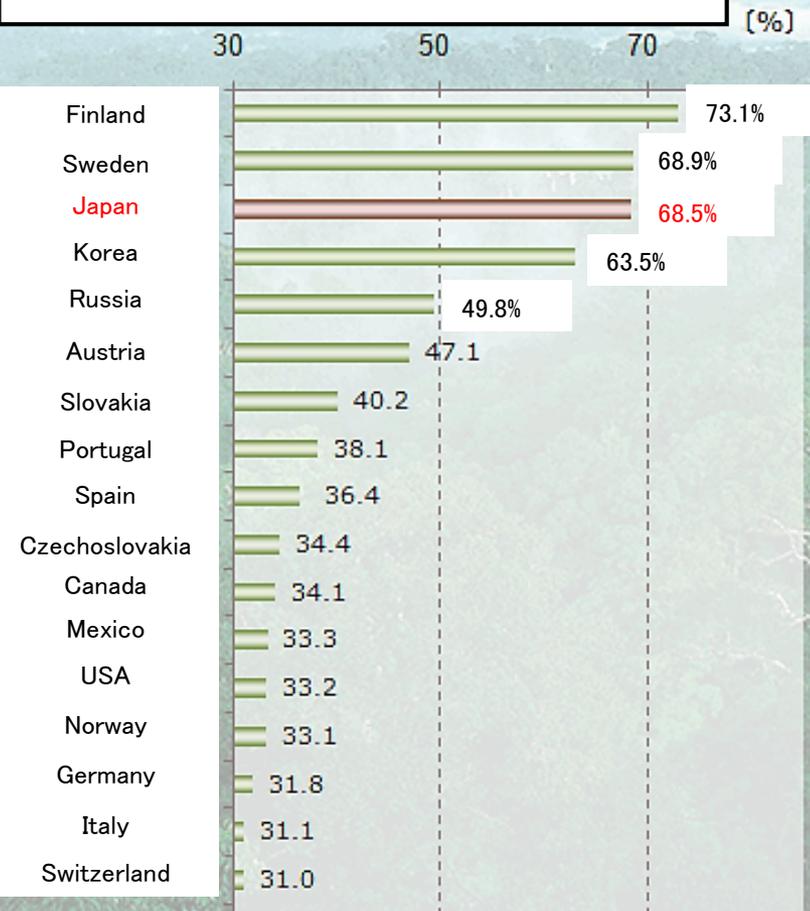
The circumstances of forest in Japan

Japan has maintained 250,000,000 ha of forest area for approximately 50 years. The forest rate is **68.5%**, the **third largest** after Finland and Sweden.

And it's no wonder that this trend has led to use rich forest resource for health promotion in Japan.



Forest rates in developed countries (2015)



Average of the rates of the world forest is approximately 30%.

From Shinrin-yoku to Forest Medicine

In 1982, Mr. Tomohide Akiyama (Director General of the Forestry Agency) proposed the word

”Shinrin-yoku”.

*Shinrin=Forest, yoku=bathing



Hypothesis of Akiyama:
**’Bathing’ in a Phytoncide-rich
environment would promote better
health.**



“sun bathing”



“sea bathing”

Concept of Forest Medicine

Modern people are stressful

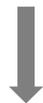


Stimulation derived from nature such as the forest

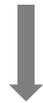


Physiological relaxation effect
Improvement of immunity

Preventive medical effects are demonstrated by scientific data



Adjustment effect = individual difference will be offset



Reduction of medical expenses

NPO Forest therapy society (Domestic)



Forest Therapy

62 Forests across Japan

Base Authorization

Certification

History of "Forest Therapy"

In the spring of 2004, in order to scientifically elucidate the "Healing" effect of the forest and conduct advance research for utilization methods, a "Forest Therapy Study Group" was launched with a corporation of companies, medical schools, research institutes etc. Also in 2004, as a national project, "Elucidation of the Effects of Forests on Functions of the Human Body" was launched.

In addition, since 2005, "The Forest Therapy Comprehensive Project" was launched to promote, develop and support the result of the above study to apply it in practical use.



Forest Therapy Society
Organizational Meeting in
March 30, 2004

Specifically below are four projects that were started:

- a. Certify "Forest Therapy Base" and "Forest Therapy Road"
- b. Raise awareness and publicity of the refreshing and therapeutic effects of the forest
- c. Examine and construct the promotion system of "Forest Therapy"
- d. Examine and construct the human resources personnel training system of "Forest Therapy"

It conducts field surveys and Physiological experiments for about 6 months to check the efficacy have been performed.

Forest Therapy Society conducts education system and certification for “Forest Therapist®” in Japan.

- ✓ There are about 1,200 members in total.
- ✓ Participating in a guided program and receiving appropriate advice can enhance the healing effect.
- ✓ The guides are familiar with each forest, the explanation is kept to a minimum .
- ✓ Using “five senses” of “sight, hearing, touch, smell and taste”.

It is a dialogue with nature.



Shinanomachi (Forest Therapy® Base)

- ✓ 1,200 people a year visit the base.
- ✓ The fee of Forest Therapy® is 10,000yen (85euro) for half a day, 15,000yen (130euro) for a day per person.
- ✓ They offer the original program to let guests use “the five senses” and get “the various awareness”.
- ✓ Zen meditation, Yoga, aromatherapy, Nordic walk, tree climbing, snow shoe hiking, crafts, aroma treatment, and so on are included in the contents other than forest therapy.
- ✓ Some **companies** use these programs for the **stress management** and the new face training of the employee.





International Society of
Nature *and* Forest Medicine

INFOM

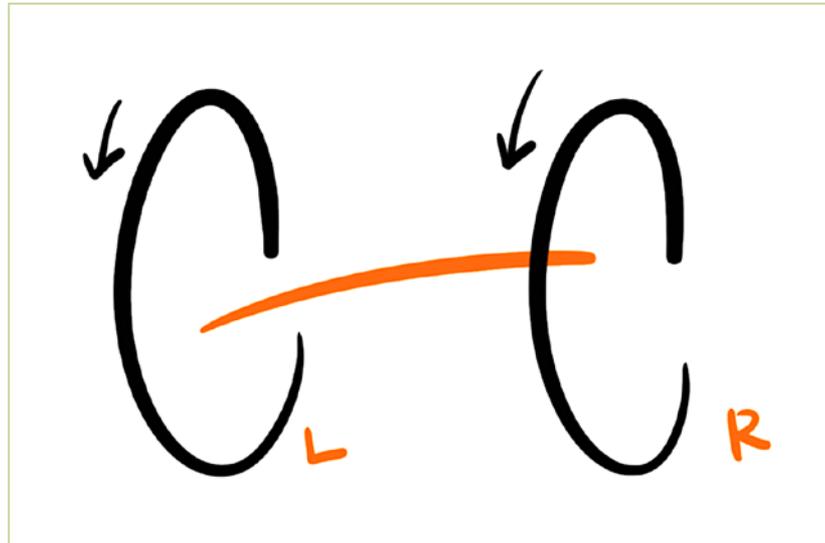


President Dr. Michiko Imai

- ✓ The international society was established in Japan in 2011.
- ✓ The scientific committee consists of approximately 20 researchers from all over the world.
- ✓ There are 41 of domestic, and 13 of international certificated doctors of Forest Medicine. (Japan8, SriLanka1, Singapore1, Germany1, Serbia1, Finland1)
- ✓ Researchers have tried to find preventive effects against diseases from forests.

It is important that Practice engages with Science

EBM
Evidence-Based Medicine



Practice

Evidence has advanced rapidly over the past ten years. Because of

- ✓ Discovering various vital functions of the forest
- ✓ Advancement of technology of measuring devices



25, March, 2018

INFOM international seminar and workshop

@Okutama, Tokyo, Japan



19, May, 2019

INFOM international seminar and workshop

@Ueno village, Gunma prefecture, Japan

- Academic workshop Program (14:00-17:00) -

Chairperson: Qing Li, MD, PhD (Nippon Medical School Hospital, Vice-President of INFOM)

1. Introduction of INFOM (20min)

Michiko Imai, MD, PhD (President of INFOM)

2. "The history and new trend on Forest Medicine in the world." (30min)

Qing Li, MD, PhD (Nippon Medical School Hospital, Vice-President of INFOM)

3. "Effect of forest therapy (Forest bathing/Shinrin-yoku) on human immune function" (30min)

Qing Li, MD, PhD (Nippon Medical School Hospital, Vice-President of INFOM)

<10min break>

4. Effect of forest therapy (Forest bathing/Shinrin-yoku) on stress (30min)

Hiroko Ochiai, MD, PhD (National Tokyo Medical Center)

5. The current situation of forest therapy base and forest therapist in Japan (30min)

Takahide Kagawa, PhD (Forestry and Forest Products Research Institute, Japan)

6. The potential preventive effect of forest therapy (Forest bathing/Shinrin-yoku) on lifestyle related diseases (30min)

Qing Li, MD, PhD (Nippon Medical School Hospital, Vice-President of INFOM)

-Day 2- 19 May 2019 On-site training and lecture

**Dr. Imai, Dr. Li, Dr. Ochiai, Dr. Fukasawa, Dr. Taniuchi, Dr. Tomoe
And other staff will be in charge.**

Time table

- 6:15- 7:00 Breakfast
- 7:00- 8:00 Check out
- 8:00- 9:00 Opening remarks, Health Check
- 9:00-10:00 Move to the site by bus
- 10:00-14:00 On-site training (including lunch time)
- 14:00-15:00 Return by bus
- 15:00-15:30 Post Health Check
- 15:30-16:30 Presentation of Certificate of Completion and Closing Remarks.
- 16:30-18:00 Move to Takasaki station by bus









Certificated Doctors

Ayurvedic doctor



Registration Number of
Medical Specialist in Forest Medicine
No. JPN-0037

**Certificate of Medical Specialist
in Forest Medicine**

May 19, 2019

Dr. Hiroko Ochiai

This is to certify that you have completed the international training course in Forest Medicine sponsored by the International Society of Nature and Forest Medicine and that you have been approved as a Medical Specialist in Forest Medicine.

Michiko Imai
Michiko Imai M.D.
President

International Society of Nature and Forest Medicine (INFOM)

Information

19–21 September, 2020

Akasawa Natural Recreational Forest

It's the birth place of the term
“Shinrin-yoku”

https://www.infom.org/symposiums/workshop_2019.html



Activities of INFOM

① Walking Forest Therapy Roads[®] with a doctor

(2013~)

② ESD and LH for children (2014~)

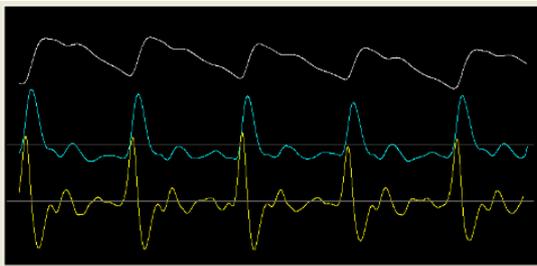
- * **ESD** (Education for Sustainable Development)
- * **LH** (Life of Health)



How can we prove that we are relaxed?

1. Parasympathetic nervous system □ ↑

- ✓ Decrease of blood pressure and heart rate
- ✓ Evaluation of Autonomic nerve activity
(HRV: Heart rate variability)



$$\text{LF}/(\text{LF}+\text{HF}) = \text{SNS}$$

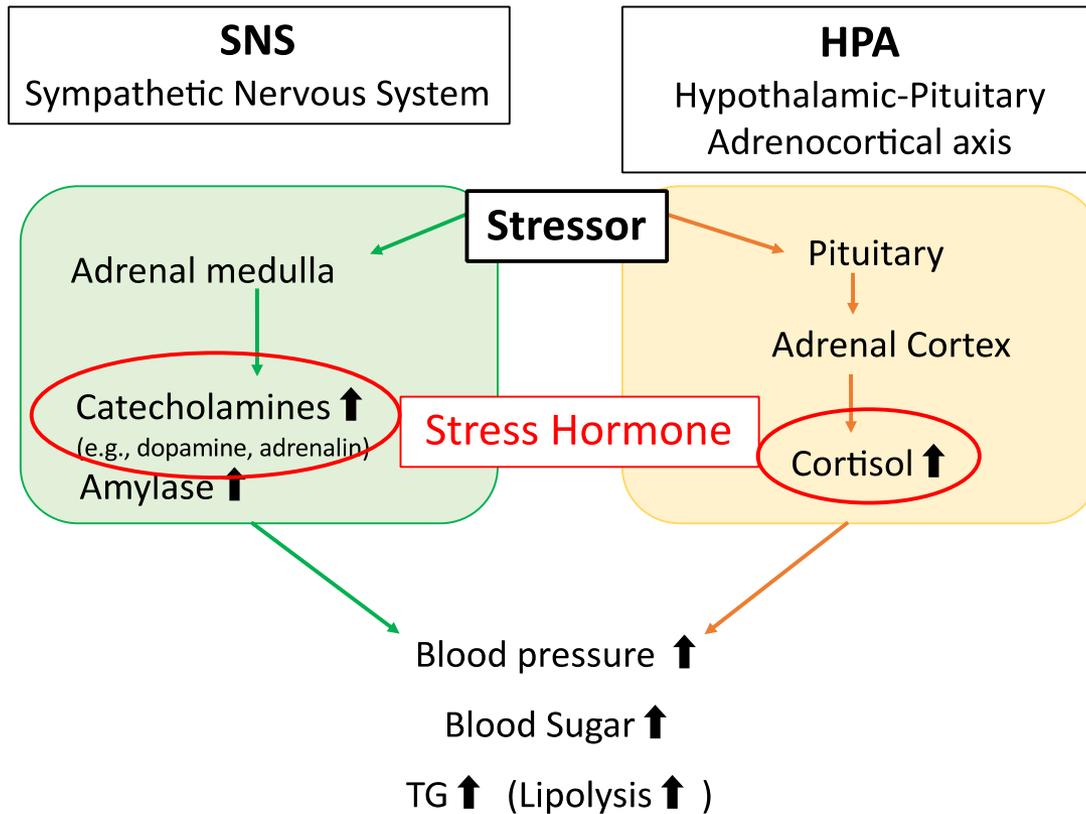
$$\text{HFLF}/(\text{LF}+) = \text{PNS}$$

LF : Low-frequency : 0.04–0.15Hz

HF : High-frequency : 0.15–0.40Hz

*SNS=Sympathetic Nervous System
PNS=Parasympathetic Nervous System

2. Stress hormone □ ↓



3. Brain activity □ ↓

Evaluation of activity of prefrontal cortex

Two-channel near-infrared spectroscopy device



**NIRS; Pocket NIRS Duo,
DynaSense, Hamamatsu,
Japan**



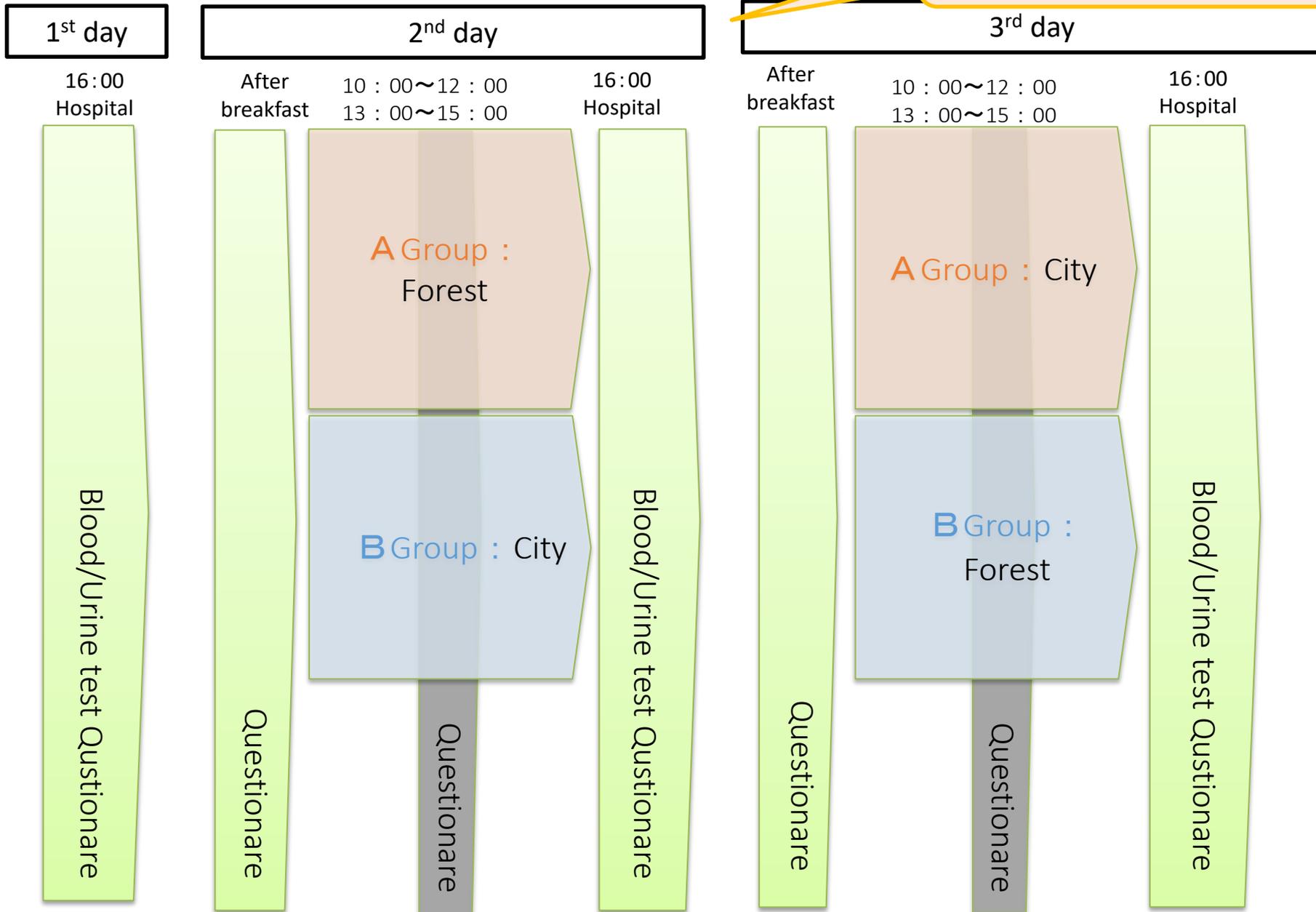
Low oxy-Hb concentrations represent the calming of brain activity.

4. Subjective evaluations

- ✓ Profile of Mood State (POMS)
 - ✓ Total Mood Disturbance (TMD)
 - ✓ State–Trait Anxiety Inventory (STAI)
- etc.

Schedule of experiment

Considering daily fluctuation, every tests were conducted at the same time every day.



Precaution of experiment

- ✓ Alcohol: Drinking is prohibited from before the experiment.
- ✓ Water will be prepared during the walk.
- ✓ Avoid excessive exercise the day before. Do not enter the hot spring for a long time.
- ✓ During the stay, you should not go out at night and be sure to go to bed until 11pm.
- ✓ Snacks, coffee and juice are prohibited during the stay, and water and tea are allowed.
- ✓ Please quit smoking while walking around smoking,
- ✓ Set your mobile phone to airplane mode while walking.



Roadmap of INFOM



- ✓ The most important mission of INFOM is the training and promotion of international natural and forest medicine certified physicians. Ayurvedic doctors and Chinese doctors are also eligible for national certification.
- ✓ Forest bathing is a multi-faceted activity that never seeks only a medical effect. INFOM is responsible for the medical effect. INFOM wants to contribute to future medicine by conducting clinical medicine experiments, publishing the results, and fostering doctors who use the results.
- ✓ We are trying to use forest therapy® for the treatment of the patient other than preventive medicine. We aim for many people becoming able to use forest therapy for their health by becoming the insurance adaptation in the future.