



Newsletter

Committee on Certification of Professional Ergonomists

March, 2019

CPEJ Newsletter Editorial board

A Plenary Meeting/Lecture Meeting was held at the CPEJ in April 2018. In November, we visited the Mitsubishi Electric Corporation Design Laboratory for a CPE seminar. Newsletters No.55 to No.58 were issued, and practical examples of ergonomics were reported. Some of the articles within the newsletters have been translated into this English version.

✦ Greetings from the chair upon his reappointment

8th Term Chair Shinichi Fukuzumi (RIKEN)

I was reappointed as Chair for the 8th term at the Plenary Meeting in April 2018, continuing my role in the previous term. I apologize for the delay in addressing this to you. As many of you may be aware, after being chosen for the role of Chair in the April Plenary Meeting, I contracted a very rare disease known as Fisher syndrome in July and had to be hospitalized for a month. I am very sorry for the inconvenience and concern this has caused to so many of you. The symptoms vary from person to person, and in my case I suffered optthalmoplegia (inability to focus the eyes), facial paralysis (inability to move the mouth or speak properly), and motor neuropathy (inability to

walk), and I spent about three weeks in a wheelchair. Upon discharge from the hospital, I could only see through one eye, and I still cannot walk without a cane. Living with this condition, I have become acutely aware of the importance of ergonomics and human-centered design. Wheelchairs cannot move up or down even though small steps, for instance, and as my eyes no longer focus properly, I have fallen down flights of stairs because of a lack of depth perception. Many local environments lack wheelchair accessibility; however, I have been on many business trips to the UK and Australia since I contracted my illness, and I've noticed that people there naturally provide support. They will carry my suitcase for me, offer me their seat, and talk to me. These experiences of generosity and common concern are relatively rare in Japan. These problems may not be solved with ergonomics research, but it is important to view these as distinctly human problems. A wide variety of support technologies, including AI, may be useful in helping the disabled navigate daily life, and ergonomics research offers the advantage of considering the experience of the person concerned and of those surrounding the user.

Before I took on this position as Chair, relatively few people knew about this institute in the Ergonomics Society. We spread the word at symposiums in annual meeting involving the Ergonomics Society. After my appointment as Chair, I visited regional events around the year to spread awareness about the institute, but I felt that there was still a lack of recognition. This was not simply a lack of information being communicated. The merits of achieving certification had not been fully explained. Certification carries numerous advantages. Until recently, we have taken this for granted, and have

failed to positively explain our clear direction as an institute. Therefore, this term, we plan to focus on clear communication about the certification we offer, and we indicate our direction on this at an early stage. We also plan to develop the certification in future terms. Our aim is not to limit the communications plan to the institute or the Ergonomics Society itself, but to spread the word about the certification program over a wide area and spread understanding of the value of ergonomics. I humbly request the continued assistance of all our members in achieving this.

➤ **Introduction to the Certification Committee of Professional Ergonomists**

Takashi Toriizuka (Nihon University)

The Certification Program for Professional Ergonomists was established in August 2003 after getting the approval of the Japan Ergonomics Society (JES) meeting held in June of that year. The mission of the program is to certify practitioners who have sufficient knowledge, skill and professional competence to solve ergonomic problems and contribute to the advancement and promotion of the field of ergonomics.

The program is operated by the JES Certification Committee of Professional Ergonomists (CPE). The governing body of the Committee consists of the chair, vice chair and other executive members selected from CPE members who operate examinations, general meetings, seminars and other events.

The program was endorsed by the International Ergonomics Association (IEA) in May 2007 and became an internationally recognized certification authority.

After June 2007, two new certification

programs were established that target young practitioners. The certifications involve the Certified Associate Ergonomics Professional (CAEP) and the Certified Ergonomics Assistant (CEA) designations.

Services for CPE members include a quarterly newsletter, CPE seminars (mainly company/site visits), the CPE salon (opportunity for member exchanges on hot topics), keynote speeches which are held at the annual general meeting and public disclosure of CPE members list. The Certification Committee of Professional Ergonomists is continuously looking for new members.

As fifteen years have passed since our Certification Program for Professional Ergonomists has been established, it is time to review the vision, philosophy, strategy, activities and member services of our Certification Committee of Professional Ergonomists. Please join us!

➤ **Report from Professional Ergonomist**

The importance of linking field testing, development, and sales

– Example of developing a care bathroom –

Aya Mikami (Sekisui Chemical Co. Ltd.)

1. Sekisui Chemical Co. Ltd. and bath tubs

Sekisui Chemical Co. Ltd. are involved in the production, development, construction, and maintenance of plumbing facilities such as baths and washrooms for nursing care facilities. The firm's current focus is on bath tubs for nursing care. Tubs in this facility need to be a controllable system to enable those requiring nursing care to take a bath in a simple manner, to ease the caretaker's work. In our independent system, the

bath and handrail can be adjusted to adapt to the situation of the person taking a bath and the position of the caregiver. For example, the comfortable positions at which people use a handrail when exiting the bath is different for tall and short people. If the handrail is moved to a place where it is easy to grab, standing up will be easier, and if the person requiring nursing care is able to stand up independently, the caregiver's burden is

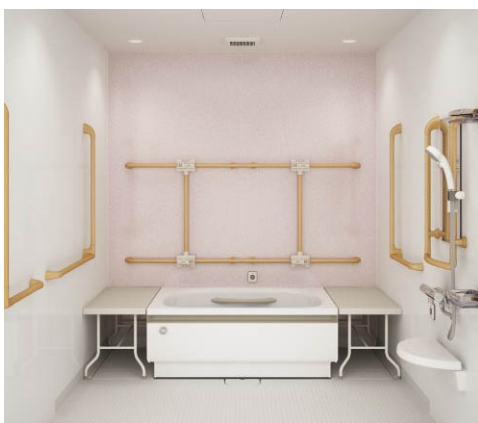


Figure 1. Bath tub units for nursing care facilities



Figure 2. Image of bath control

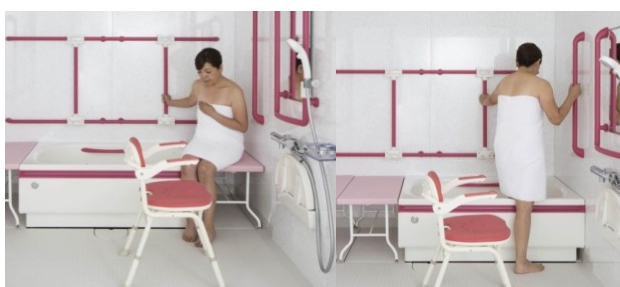


Figure 3. Design change that makes it easier for that person to take a bath

vastly reduced. For patients who are hemiplegic, moving the bath to the side from where they can more easily enter makes it easier for them to take a bath.

I provide information to the development department by researching care facilities to understand the design from a user perspective, so that bath tubs can be made even easier to use. By providing this research to the development department, I help them to communicate the use of new products and the effectiveness of new functions to the sales department in the clearest way.

2. Grasping the essence of care

Five years ago, we were told in a group interview with caregivers that “our work is not only about what happens in the bathroom. We want you to understand the overall operational flow of the care given to the users.” I remember feeling confused at this as we were dedicated toward realizing a “bathroom where bathing care can be provided safely and with a lower level of burden.”

At that time, it was natural for the caregiver to lift up a patient and many facilities expected caregivers to use assistive lifts that treated people like luggage. As these devices are very expensive, they have failed to achieve widespread usage. Additionally, bath controls that could decrease the burden were not often used in the medical field because the bath was heavy or time was short. From the perspective of caregivers, we heard that “this was just addressing surface issues. We want you to create products that understand the essence of nursing care.”

Knowing about nursing care and having provided the same are very different. The biggest difference is thinking about the purpose of nursing care. I intended to understand this, but I

was probably talking to these caregivers without understanding the purpose behind their actions. We were searching for a revolutionary idea of being able to enter and leave the bath by human hands alone, without placing stress on the back. However, the goal of using human hands alone is not the essence of care. This was a truly valuable experience.

Currently, we are aware that we understand nursing home operations as information, but we have no nursing care experience. To address this, we are working to ask caregivers what they focus on in the nursing field and how they feel when they interact with those requiring nursing care.

3. Continued communication with the customer

Nursing care places extremely strenuous physical and mental burdens on caregivers. Additionally, the aging of caregivers and the lack of nursing care resources can lead to problems. Since caregivers often cannot continue working with back pain, more nursing home institutions are realizing that by using lifts and welfare tools skillfully, care can be provided safely without lifting people up.

In fact, based on a recent user survey, we can see that more customers are controlling the bath. We were glad to hear that “being able to move the bath meant that people requiring healthcare could safely straddle the bath and could bathe independently” Users are utilizing our product because the features of the bathroom, summarized by the Planning Department and Development Department, have been clearly correctly communicated by sales staff.

Toward the goal of being able to take a bath safely, we use our knowledge and experience in ergonomics such that the caregivers can safely provide nursing care. We plan to design bathrooms, facilities, and services that can also be

used with peace of mind and comfort by the person requiring healthcare.

Aya Mikami: After completing a course in Design Science at Chiba University Graduate School, she engaged in a usability survey with the company U’eyes Design. In 2009, she graduated from the Graduate School of Business Administration, Keio University. Currently, she oversees survey and planning for baths units and bathing care products for nursing care at Sekisui Home Techno Corporation. Her hobbies are running marathons and reading.

➤ Report from Professional Ergonomist Universal Design SOS Handbook

Naotsune Hosono, Ph.D.
(Director of NPO Niimaru)

There is an association of architects working of hearing impairments, named Architectural Association of Japanese Deaf (AAJD*). The main members of this group are level 1 and 2 deaf architects and their activities are to share architectural information and look for solution. Here is an introduction about “SOS handbook” designed by AAJD and produced by a grant of the Tokyo Metropolitan government and an automobile company.

The chairman of AAJD is a deaf architect, and he had harsh experience that when he suddenly fell sick and he was carried to the hospital by an ambulance, he faced the problem of misunderstanding with the paramedics. As one patient, his priority wish was to tell the paramedic where his pain was and how severe it was, however the paramedic was focused on contact information of his family. Considering on his experience, a point and show style handbook has

been designed which can be used like a restaurant food menu [1-3]. The first edition in 2011 referred to demography of foreign nationals living in Japan, six languages; Japanese, English, Korean, Chinese (simplified and traditional), and Portuguese were selected to include in the handbook. At the revised edition in 2018, five languages were added; French, German, Spanish, Italian, and Russian, preparing to the Tokyo Olympics/Paralympics in 2020. Figures 1-4 are the English pages.



Fig.1. Front cover with CUD certification mark at the top left

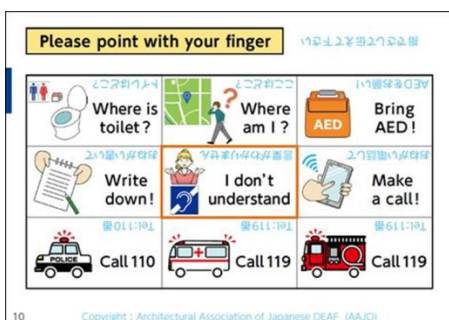


Fig.2. Dialogue page

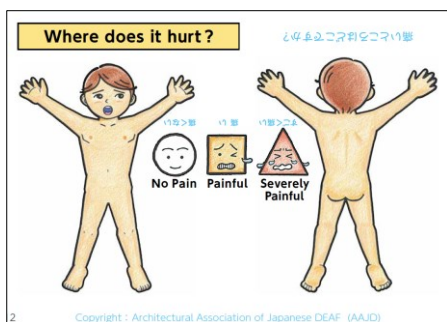


Fig.3a. Page where the user points and indicates the primary complaint on the skin

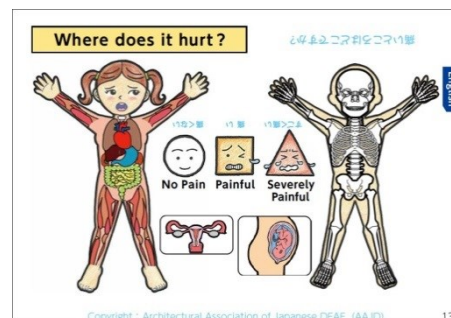


Fig.3b. Page where the user points and indicates the primary complaint on the viscera

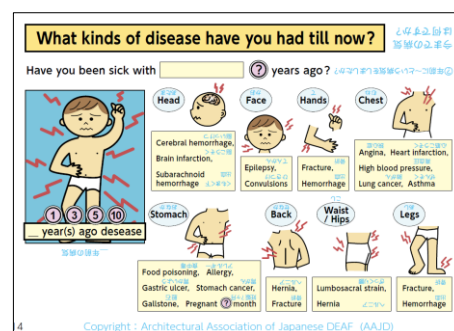


Fig.4. Page indicating symptoms

The main design members are AAJD deaf chairman, a sign language interpreter, a staff of CSR department in the automobile company and the author (CPE). Following to the fundamental concept of ergonomics, this handbook is designed with the ISO9241 series. The handbook was produced particularly using the human centred design (HCD) method (ISO9241-210, previous ISO13407) [4] and context of use (ISO9241-11) [5]. For achieving the goal, this SOS handbook (equipment) is designed to enable foreigners and hearing impaired people to interact easily in physical and social environments. After the prototype was created, the evaluation experiments were carried out following the concept of HCD by the intended users such as foreigners and the hearing impaired. Then the efficiency was measured by communication time. The effectiveness was measured by noting the success of communication using the handbook.

The satisfaction was measured by means of the Semantic Differential (SD) method.

The features of this handbook are mainly following three points;

1. **Easy to use:** The previous version was designed with the goal to be used by those who do not know sign language to perform dialogues just pointing the items. This was intending to facilitate dialogue with paramedics at the emergency situation. The revised version is reviewed to be used expanding users of foreign nationals and persons with disabilities. Additionally, anticipating a face to face dialogue situation, upside down superscripts are added.
2. **Expansion in number of supported languages:** Preparing for Tokyo Olympics and Paralympics, the five languages are added. They are French, German, Spanish, Italian, and Russian. The handbook includes totally 11 languages of 10 countries.
3. **Color blindness support:** The Color Universal Design Organization (CUDO**) aims to create a society where people suffering from color blindness will easily use daily materials. At the handbook revision, CUDO consulted and verified in colours selection. The proof is 2018 CUD certification mark on the top left of the front cover.

At the publication following to the process of HCD, users of foreigners and the hearing impaired persons were participated at the experiment. The dialogue tasks that would be used in virtual emergencies are prepared. The required elapsed time was measured compared efficiency between when using the handbook for dialogue and when drawing on paper or gestures without using the handbook. For effectiveness measure, participants were asked whether the dialogue was precisely introduced. User

satisfaction was measured by the interviews that whether users prefer to use the handbook at an emergency.

As a result, 20 sets data by five pairs as conversation partners [1];

Efficiency: When using the handbook, efficiency was improved by 20% compared to when not using it. In a distribution analysis, (within the test subject for each factor, $df_1=1$, $df_2=9$), it is confirmed a significant difference of $F=6.95$, $p=0.027<0.05$.

Effectiveness: In the reliability of content introduction from one participant to the other, it was confirmed that accuracy was improved by approximately 20%. Distribution analysis confirmed that there was a significant difference of $F=4.89$, $p=0.054<0.1$.

Satisfaction: During follow up questionnaire related satisfaction, one participant told “when I have this kind of handbook I feel relieved.”

There was an opportunity that the handbooks were handed over at the international universal design conference ICCHP2018*** held in Linz, Austria, in July 2018. Fortunately many overseas experts were impressed with its quality of comprehensiveness. This was also introduced in an article of JES journal [6] (Figure 5).



Fig.5 . Handbook introduction at ICCHP2018 conference

The handbook has been distributed by the AAJD to groups of hearing impaired people as well as to administrative agencies, fire departments, and hospitals in Japan. There is a story at a dental clinic, a patient undergoing treatment cannot speak well with opening mouth large. Then the handbook is helpful to tell the dentist about severity of the tooth pain. This SOS handbook is also open at the AAJD website*. When SOS handbook was introduced at ICCHP2018 many participants sincerely commented to be used various situations. The comments and impressions by CPE experts to AAJD will encourage for future development and distribution of the design, for example to install it on a smart phone.

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- * AAJD
<http://www.aajd.org>
- ** NPO Color Universal Design Organization
<http://www.color.or.jp/>
- *** ICCHP2018
<http://www.icchp.org/welcome-chair-18>

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