Thailand
King Chulalongkorn Memorial Hospital, Faculty of Medicine Chulalongkorn University
Faculty of Medicine Siriraj Hospital, Mahidol University

Collaboration Program with the Private Sector for Disseminating Japanese Technology for advanced endoscopic surgery in Thailand Final Report (Public Version)

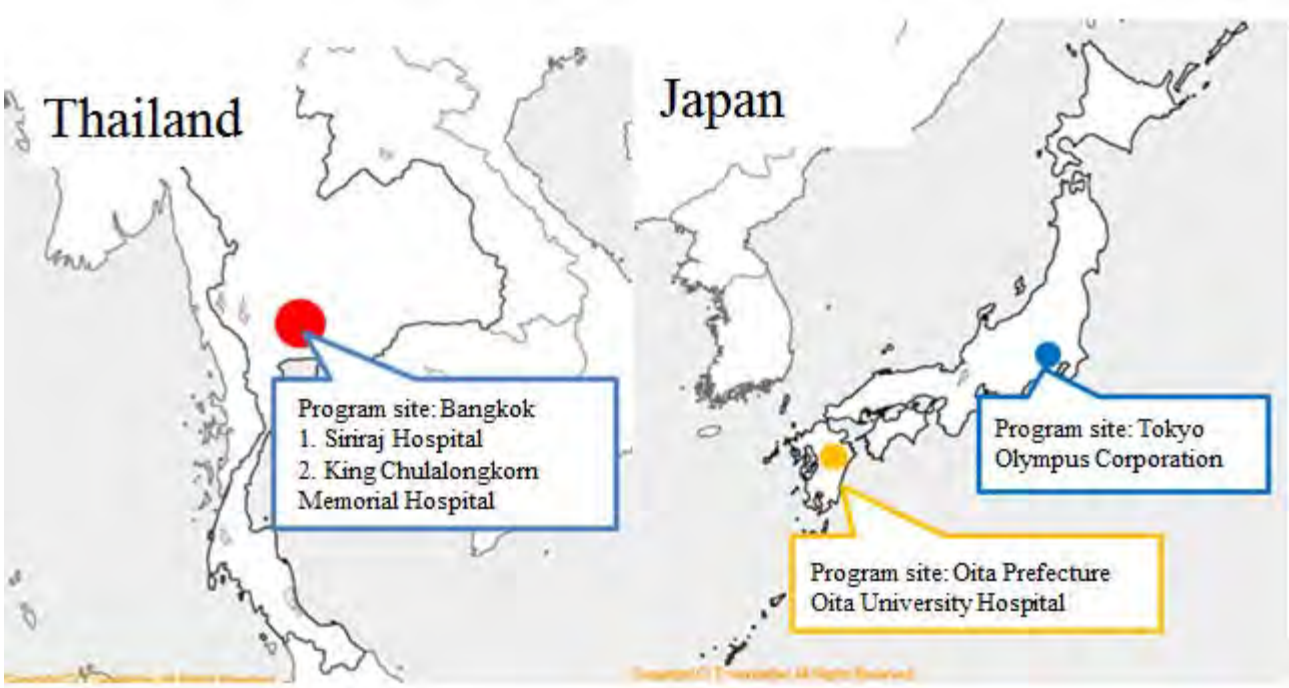
September 2017

Olympus Corporation

OS
JR
17-068

Contents

Map



Source of the base map: Sekai Chizu (URL: http://www.sekaichizu.jp/; date of access, July 3, 2017)

List of Abbreviation

Acronym	Term in full spelling
2D/3D	Two Dimensions/Three Dimensions (Two-dimensional/Three-dimensional imaging)
4K	4K (resolution)
ASEAN	Association of Southeast Asian Nations
BME	Bio-Medical Engineer
CCD	Charge-Coupled Device (Image sensor using a charge-coupled device)
CSCSTC	Chula Soft Cadaver Surgical Training Center
ELSA	Endoscopic and Laparoscopic Surgeons of Asia
ESD	Endoscopic Submucosal Dissection
ESSQS	Endoscopic Surgical Skill Qualification System
GDP	Gross Domestic Product
GERD	Gastroesophageal Reflux Disease
GI	Gastrointestinal
GS	General Surgery
HD(TV)	High-Definition (Television)
IMF	International Monetary Fund
JICA	Japan International Cooperation Agency
JSCCR	Japanese Society for Cancer of the Colon and Rectum
JSES	Japan Society for Endoscopic Society
LEST	Laparoscopic and Endoscopic Surgeons of Thailand
MESDA	Mekong Endoscopic Surgery Development Association
MIS	Minimally Invasive Surgery
ODA	Official Development Assistance
QOL	Quality of Life
RCST	Royal College of Surgeons of Thailand
SD(TV)	Standard Definition (Television)
SiTEC	Siriraj Training and Education Center for Clinical Skills
TFDA	Thai Food and Drug Administration
T-TEC	Thai-Training and Education Center
UHD	Ultra High Definition
WHO	World Health Organization

Chapter 1 Executive Summary

1.1. Executive summary

Thailand has a population of about 67 million and an economy of about 400 billion U.S. dollars in nominal GDP, or about 5,900 U.S. dollars in nominal GDP per capita, as of 2014. The ratio of people aged 65 and over to the entire population has already exceeded 10%—in other words, the country has already become an aging society. It is therefore predicted that demands for medical services will grow further. According to the disease trends published by the WHO, cancers are the second leading cause of death, behind cardiovascular diseases. Colorectal cancer, the target disease of the Collaboration Program with the Private Sector for Disseminating Japanese Technology for advanced endoscopic surgery (hereinafter, the "Program"), ranks third among men and fifth among women in terms of the number of incidences and deaths as of 2012. These incidences and deaths have showed upward trends like those in developed countries, constituting a social issue. These trends can also be seen in Japan, where a shift in surgical treatment modalities of colorectal cancer, from conventional open surgery to endoscopic surgery, is being promoted. Compared with open surgery, endoscopic surgery is known to effectively improve patients' Quality of Life(QOL) and medico-economic performance. In Japan, under the leadership of Japan Society for Endoscopic Society (JSES), endoscopic surgery has achieved world-leading outcomes, dissemination, and development, and has also demonstrated great technical innovation and progress in medical equipment for endoscopic surgery as a result. In the Program, we endeavored to contribute to the solution of this social issue in Thailand by leveraging Japan's knowledge and experience concerning colorectal cancer.

To disseminate and develop safe and effective endoscopic surgery in Thailand, the Program provided endoscopic surgery training to Thai surgeons with the goal of providing training to at least 100 young surgeons and at least 10 prospective trainers. In addition, the Program set another goal of triggering to transfer various things established by JSES, including the training curricula, endoscopic surgical skill qualification system (ESSQS), and treatment guidelines, to the related academic societies and surgeon training institutes in Thailand. For the training conducted in the Program, medical devices made in Japan were used to provide the participants an opportunity to experience using them so they could recognize and gain trust in the performance of Japanese medical devices and technologies.

The Program provided six training sessions on endoscopic surgery for colorectal cancer—one session at the training sites in Japan (hereinafter, the "Japanese Site Training" or "Japanese Site Training Course") and five sessions held in Bangkok (hereinafter, the "Thai Site Training" or "Thai Site Training Course")—for an approximately 2-year period from June 2015 to May 2017. Oita University, having received an endorsement from JSES, developed the curricula and programs of the training courses, gave lectures, and provided technical guidance. We partnered with the Thai hospitals in charge of the Program—King Chulalongkorn Memorial Hospital, Faculty of Medicine, Chulalongkorn University (hereinafter, "King Chulalongkorn Memorial Hospital") and Faculty of Medicine Siriraj Hospital, Mahidol University (hereinafter, "Siriraj Hospital") (both hospitals may hereinafter be referred to as the

"Thai Program Organizers")—to use their training centers as training sites. We also obtained cooperation from both institutions and Laparoscopic and Endoscopic Surgeons of Thailand (LEST) in the recruitment and screening of applicants for participation in the training courses.

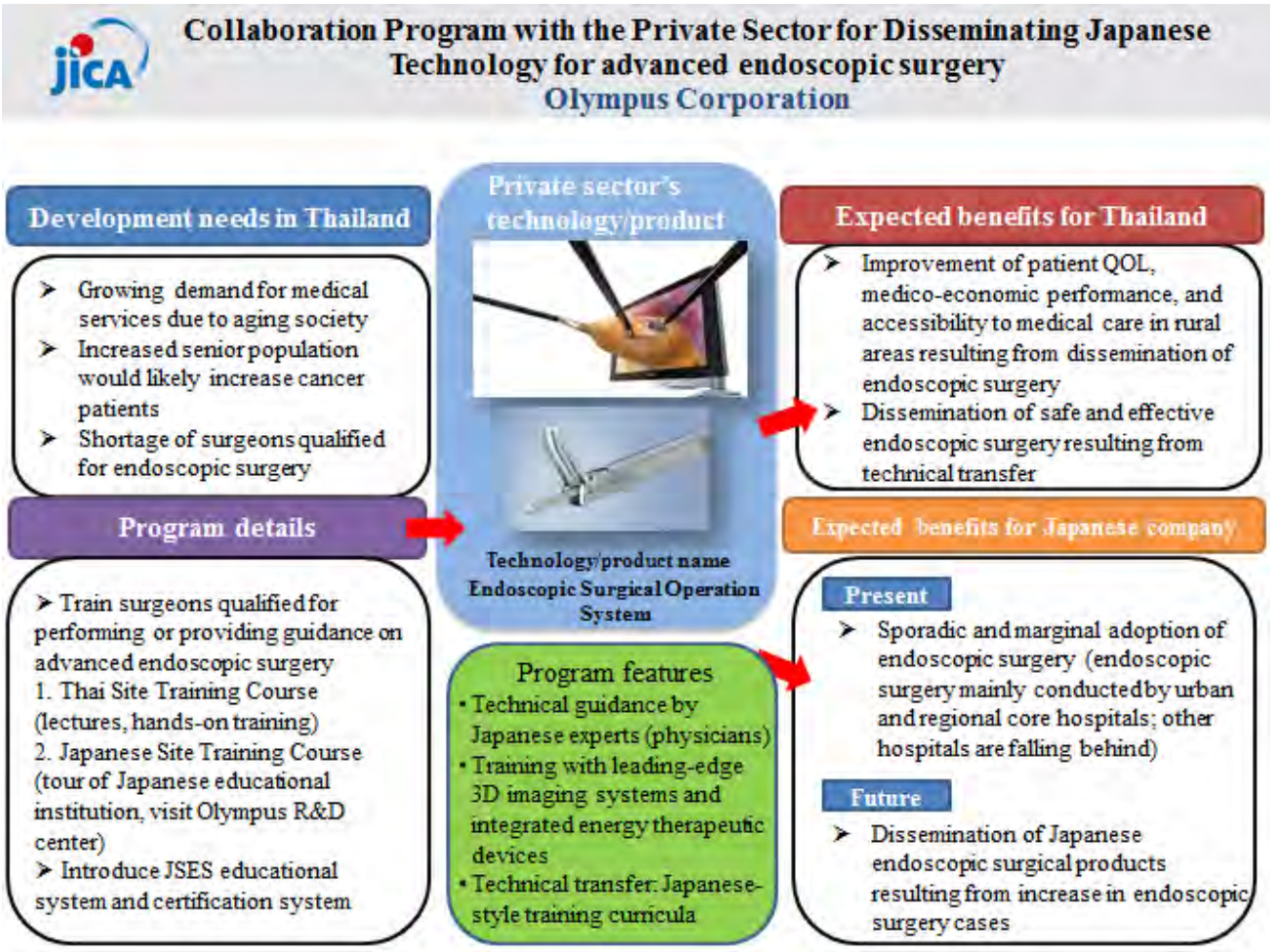
The six training sessions were attended by 113 young surgeons and six prospective trainers in total, with a certificate of participation granted to all 119 participants. Participants in the training using Japanese leading-edge medical devices commented that they were highly satisfied with their experience of using these devices. Moreover, we conducted a follow-up survey in which answers were obtained from 12 participants. We confirmed that four of them were performing an increasing number of endoscopic surgeries for colorectal cancer as the principal operator after their participation in the training program. The remaining eight participants responded that they had gained confidence in their ability to participate in surgery as an assistant or camera-man (assistant who operates endoscope during surgery).

Efforts on technical transfer also went on schedule. At the closing ceremony, held during the final Thai Site Training session, those in charge of the Program from both Thai Program Organizers expressed their intention to consider introducing JSES-style schemes to Thailand, including the training curricula, ESSQS, and guidelines. In addition, one Thai Program Organizer expressed their intention to endeavor to standardize various educational programs for endoscopic surgery in Thailand. Another Thai Program Organizer emphasized that the standardization would require collaboration among all stakeholders in Thailand as well as cross-sector and international exchange (e.g., between JSES, Japan International Cooperation Agency (JICA), Mekong Endoscopic Surgery Development Association (MESDA), Endoscopic and Laparoscopic Surgeons of Asia (ELSA),and Japanese enterprises) to be implemented on a continual basis.

We hope that the achievements of the Program will encourage efforts to disseminate across Thailand safe and effective endoscopic surgery based on the JSES training curricula.

The Program has also contributed to the surgical product business development. Through the Program, we have made progress in grasping the unique character and features of the surgical device market and have formulated an outline of medium to long-term strategies. This achievement has helped create the infrastructure for posting double-digit annual growth on a continuous basis, which is required as a business objective in both the development of emerging markets and the surgical business field. While the duration of Program activities was limited to 2 years, continued efforts should be made to achieve the Program's goal: the dissemination and development of endoscopic surgery. And though we facilitated to improve the basic system that would allow Thailand to train endoscopic surgery specialists on its own in Program period, Thailand desires continued technical assistance from Japan. Considering that the Thai Program Organizers have facilities and equipment which are ready to be used to train endoscopic surgery specialists, and in the interest of advancing the ASEAN Health Initiative as well, it is our hope that, with government support, technical assistance be expanded to ASEAN as a whole, especially to the Mekong region that includes Thailand.

1.2. Program schematic view



Definition of “advanced endoscopic surgery”:

“Advanced endoscopic surgery” means difficult procedures like radical cancer surgery. Cancer surgery consists of the removal of the tumor, surrounding tissues and/or organs as well as lymph node dissection and reconstruction of organs, which requires advanced surgical strategy and techniques. On the other hand, the surgical procedures for benign diseases such as cholecystectomy, appendectomy and hernia repair surgery are called “basic endoscopic surgery”.

This Program adopted the endoscopic surgery for colorectal cancer treatment, which is classified into “advanced endoscopic surgery”.

Chapter 2 Program Background

2.1. Program background

Thailand, an ASEAN country, has a population of about 67 million and an economy of about 400 billion U.S. dollars in nominal GDP, or about 5,900 U.S. dollars in nominal GDP per capita[1], as of 2014, placing it among "high and middle-income countries" as defined by the World Bank. According to a World Bank publication, people aged 65 and over make up 10% of the entire population[2]—in other words, the country has already become an aging society—and the demand for medical services is therefore expected to grow. The senior population is projected to reach 19% of the population in 2030[3], shifting the country from an aging society to an aged society. According to data from the WHO, cancers are the second leading cause of death[4], behind cardiovascular diseases. Colorectal cancer, the target disease of the Program, ranks third among men and fifth among women in terms of the number of incidences and deaths as of 2012[5]. These incidences and deaths have shown upward trends like those in developed countries. Colorectal cancer is said to be more likely to be cured if treated at an early stage. As surgical treatment modalities for this cancer, open surgery and endoscopic surgery exist. Recently, endoscopic surgery, a minimally invasive therapy, has been disseminated globally, and is known to have many advantages over open surgery, including improved patient QOL and medico-economic performance (for example, shorter postoperative hospitalization).

Endoscopic surgery in Japan is world leading in terms of its surgical techniques and outcomes. Here, a globally unique certification system and guidelines have been introduced in pursuit of developing and disseminating safe and effective endoscopic surgery. We therefore expect the transfer of educational systems and surgical techniques established in Japan to Thailand could lead to make a huge contribution to the improvement of medical services in the country.

The program leader (hereinafter, "Program Leader"), a marketing approval holder of endoscopes and related equipment, has set out to grow its surgical device business and expand it in emerging markets, mainly in ASEAN countries, as an action agenda in its medium-term management plan. Since establishing a local subsidiary in Thailand in 2000, the company has been investing intensively in Thailand to expand its business into the Mekong region.

We expect the dissemination of endoscopic surgery in Thailand will help improve medical services in Thailand, while providing the industry with valuable opportunities to introduce and disseminate Japanese leading-edge technologies and products.

2.2. Technologies to be disseminated and their potential in contributing to development goals

2.2.1 Detailed description of the technologies

Endoscopic surgery is recognized as a patient-friendly procedure with fewer wound complications and better cosmetic results. Endoscopic surgery is said to have an advantage over open surgery in terms of its medico-economic performance due to ease of postoperative pain control and shorter postoperative hospitalization. On the other hand, it takes considerable time to acquire the skills for endoscopic surgery,

as it is performed in a limited space using dedicated instruments. Operators are therefore expected to learn safer and more effective procedures.

Endoscopic surgery consists of the following steps: (i) a small incision is created in the abdomen; (ii) endoscopic surgery is then performed through access ports to guide surgical equipment. The surgery uses various medical devices, including endoscope imaging systems that visualize the operative field, various surgical instruments (e.g., forceps, scissors) called hand instruments, and an energy device used to cut and seal vessels.

In the field of medical devices for endoscopic surgery, European and U.S. medical device manufacturers have maintained a competitive edge partly because endoscopic surgery was developed in Europe. Viewed from a technology perspective, however, Japanese manufacturers have developed some unique products with world-first technologies such as 4K surgical endoscope imaging system and flexible endoscope that are comparable to those from European and U.S. manufacturers in terms of competitiveness.

1) Surgical endoscope imaging systems

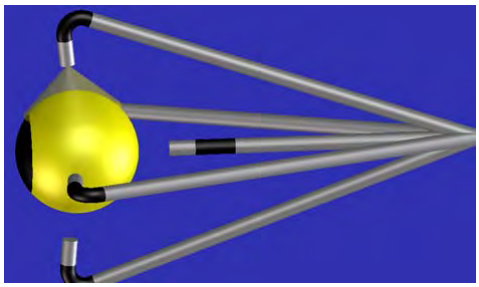
Technical progress is said to be the main contributor to today’s dissemination and development of endoscopic surgery. As mentioned above, endoscopic surgery is characterized by its method of performing surgical operation through visualization on a monitor screen via a video camera. Increasingly better image quality has been sought since the time of its creation, with image quality advancing from SD (Standard Definition) to HD (High-Definition) to UHD (Ultra High-Definition). It goes without saying that Japanese technology has largely contributed to such improvements in image quality. Another problem was the difficulty of manipulating surgical devices via 2D images on the monitor, which is unlike laparotomy. 3D visualization of endoscopic images was commercialized as early as the 1990s, but did not become widely popular. It was not practical for surgery because the endoscope and system themselves were large, and sufficient image quality could not be obtained due to lack of brightness with 3D.

3D surgical endoscope imaging system

- World's first 3D system providing HDTV-quality images
- World's first endoscopic design in which a CCD is embedded in the endoscope distal end
  Adopting this structure provides a distal end bending function which allows vertical and horizontal manipulations of field-of-view direction.

The conventional endoscope design using a rigid telescope offers a limited observation visual field. By contrast, an endoscope with a CCD embedded in its distal end, which provides a distal-end bending function, provides freely adjustment of the observation visual field, making it possible to look behind objects and obtain other views previously difficult with the conventional telescope.

3D surgical endoscope imaging system



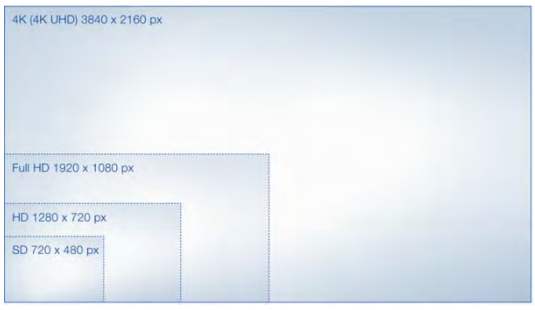
Flexible endoscope

4K surgical endoscope imaging system

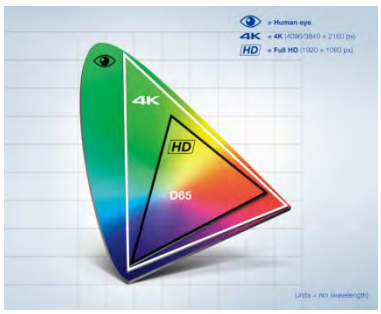
- World's first commercially available endoscopic system providing 4K-quality images
- Development of an endoscope with brightness and chromatic aberration improved to 4K quality
- High-definition surgical field visibility on the 55-inch large image monitor

The Japanese 4K surgical endoscope imaging system with a horizontal pixel number of at least 3,840 pixels is globally unique. The addition of 4K UHD technology to magnified endoscopic image is expected to result in much better observation capacity. It has also made it possible to use a large monitor, which could not be used with the conventional system. It is said that using a large monitor allows them to check the anatomy precisely and to perform surgery with a realistic feeling.

4K surgical endoscope imaging system
55-inch large image monitor



Resolution schema
（SD, HD, Full HD, 4K UHD）



Wide color gamut

2) Energy device

Vessel sealing and cutting are important surgical techniques. The energy device helps make those methods easier. Ultrasonic shears and high-frequency advanced bipolar systems are common in the market. Each of these two types of energy device has its advantages and disadvantages according to the characteristics of the energy sources. Japanese energy devices are the only ones in the world which use an integrated form of these two types of energy.

Integrated bipolar-and-ultrasonic energy device

- World's first energy device allowing simultaneous emission of bipolar high-frequency and ultrasonic energy

Vessel dissection, vessel sealing using threads or clips, and vessel cutting are conducted repeatedly. Accordingly, device functions required for vascular treatment include capabilities related to dissection, grasping, hemostasis, vessel sealing, and incision. In general, ultrasonic shears have better dissection, grasping, and incision capabilities than high-frequency advanced bipolar system, while high-frequency advanced bipolar systems are superior to ultrasonic shears in terms of hemostatic and vessel sealing capabilities. The development of a device allowing concurrent use of both ultrasonic and high-frequency bipolar energies has made possible to satisfy all of these five functions required for vascular treatment.

Hand piece (Consumable)

Generator (Main unit)

Generally speaking, medical device-related regulations in countries around the world, including the Pharmaceutical and Medical Device Act in Japan, do not permit the use of expressions, "world's first," "world-leading," and the like. In addition, clinical efficacy in advertisement has to comply with the regulations. It is therefore difficult to find a significant difference among competitors in the specifications or performance indicated in brochure.

Surgical endoscope system mainly used in Thailand is conventional 2D system. In advanced countries, high performance imaging system such as 3D system or Ultra-High Definition system has become popular according to spread of endoscopic surgery to treat advanced procedures such as cancer treatment. In Thailand, though it is still introduction stage, and it is expected to expand the market for high

performance endoscope imaging system according to advancement and dissemination of endoscopic surgery.

In the Thai endoscope imaging system market, one Japanese manufacturer and one German manufacturer are the main competitors, with one U.S. manufacturer trying to catch up to them. The German manufacturer has long been conducting business in the surgical endoscopy field, and appears to have the largest share of the global market. The manufacturer has been ranked high on product quality and performance and has strong, established brand names. The U.S. manufacturer has maintained brand names across all surgical fields as an surgical equipment manufacturer. By leveraging its comprehensive strength in this way, the manufacturer has occupied the largest share of the U.S. market for endoscope imaging system.

In the energy device field, two U.S. firms have had equal shares of the global market for a long time. This situation applies to the Thai market as well, but the Japanese manufacturer is seeking to enter the market by leveraging new technology. In the Japanese market, the Japanese manufacturer is catching up to the other two leading manufacturers, but it takes some time yet for the manufacturer to lay the groundwork for entering overseas markets. Energy devices have been spreading mainly at leading hospitals in Thailand. Necessity of energy devices is increased with advancement of operation, it is expected that a market of energy devices expands with advancement and diffusion of endoscopic surgery.

(Training of endoscopic surgery in Japan)

Surgeon has to manipulate hand instruments with watching two dimensional image on monitor, and in endoscopic surgery which takes a longer time to acquire techniques; necessary to have a skill and knowledge of regional anatomy differ from conventional open surgery.

In Japan, novice surgeons receive dry lab trainings with a model to learn basic operation of hand instruments such as suturing and knotting, or wet lab trainings that simulates actual clinical operation. After that, as a part of training, they have experiences of observing operations by experts, and they join actual operation as a camera-man or assistant. Through these trainings under the supervision of trainer, novice surgeon increase the knowledge and experiences, which makes one become independent.

(JSES skill qualification system[6])

In 2004, JSES introduced global unique skill qualification system to evaluate performance of surgeon and to certify surgeon who meets a criteria to be a trainer. It is aimed at realizing healthy spread and progress of endoscopic surgery.

It is necessary for an applicant to get eligibility for admission to an examination such as number of operation in some target procedures, number of presentation in congress, number of published paper in journals, number to receive training hosted by medical societies. Applicant has to send non edited procedure video to the secretariat of JSES skill qualification system. More than one judges scores applicant’s technique according to predefined standard such as progress of operation, management of

field of view, operation technique, etc. Fairness is guaranteed by double blind system under anonymity of applicant and judge. Accumulated examination pass rate of colorectal surgery field is approx. 30%.

As of 2017, more than 1,800 surgeons have been certified and become trainers for endoscopic surgery in Japan.

(Japanese Society for Cancer of the Colon and Rectum (JSCCR) Guideline[7])

In Japan, establishment and diffusion of guidelines for the treatment of cancer aim to achieve that everyone benefits from the standardized cancer treatment nationwide. With reference to the latest evidences from all over the world, the guidelines show standardized cancer diagnosis and treatment in the pursuit of best patient outcome at the date of issue of guidelines. In case of the diagnosis and treatment for colorectal cancer, Japanese views differ from the ones from western countries. Japanese Society for Cancer of the Colon and Rectum (JSCCR) guidelines for the treatment of colorectal cancer values the clinical evidences from Japanese experts. The surgical performance of Japan ranks as high class in the world, whose findings and experiences would benefit the welfare in Thailand.

2.2.2. Potential contribution to development goals

We expect the dissemination of endoscopic surgery will contribute in the following three ways, as previously stated in many publications.

First, the dissemination could help improve QOL for patients. This includes reducing postoperative wound complication and the number of cases of postoperative intestinal obstruction, as well as enabling early recovery. Second, the dissemination could contribute to reduced medical costs through improved medico-economic performance (for example, a shorter postoperative hospitalization period). Moreover, the dissemination could contribute in this way: Thailand has about 1,200 hospitals (903 public hospitals and 326 private hospitals)[8], and of those, an estimated 200 hospitals have adopted endoscopic surgery. We expect the dissemination of endoscopic surgery could help prevent the concentration of patients at certain hospitals and so improve the operating efficiency of tertiary hospitals, while also providing high-quality medical services without regional gaps. This translates into, in other words, improved accessibility.

However, such benefits and the effect of development are hard to measure in the short term. The Program aims not only to train surgeons capable for endoscopic surgery in the short term, that is, within the Program period, but also to improve the infrastructure of conducting the surgical training for promoting the dissemination and development of safe and effective endoscopic surgery in Thailand over the medium to long term.

Sources

1: IMF. *World Economic Outlook Database* (2017)

2: The World Bank. *Population Estimates and Projections* (date of access: June 20, 2017; http://datatopics.worldbank.org/health/Population.aspx)

3: Same as the above
4: WHO. *Noncommunicable Diseases (NCD) Country Profiles* (2014)
5: WHO. *POPULATION FACT SHEETS* (2012)
6: JSES “Endoscopic Surgical Skill Qualification System” (date of access: June 20, 2017; http://www.jses.or.jp/member/gijutsu.html)
7: JSCCR “Japanese Society for Cancer of the Colon and Rectum (JSCCR) guidelines 2016 for the treatment of colorectal cancer” (date of access: September 6, 2017; http://www.jsccr.jp/guideline/index.html)
8: Ministry of Economy, Trade and Industry. *Report on Detailed Survey of Environments Surrounding Emerging Healthcare Markets—Thailand* (2016)

Chapter 3 Program Outline

3.1. Objectives and goals of the Program

3.1.1. Program objectives

To disseminate and develop safe and effective endoscopic surgery in Thailand, the Program provided endoscopic surgery training to Thai surgeons (those who still need to acquire the skills and experiences to perform cancer surgery as principal operator). The target disease of the Program was colorectal cancer, ranked high in Thailand by number of deaths. In addition, the Program aimed to promote transferring various techniques established by JSES, including its training curricula, ESSQS, and treatment guidelines, to relevant academic societies and teaching hospitals in Thailand. Moreover, Japanese medical devices were used in the Program training to provide the participants an opportunity to experience using them and so recognize and gain trust in the performance of Japanese medical devices and technologies.

3.1.2. Goals to be achieved by the Program (contribution to the development goals of the target country/region/city)

Endoscopic surgery training was provided to young Thai surgeons seeking to learn colorectal cancer surgery in accordance with the JSES training curriculum. This training was provided with the objective of having participants acquire skills for safe and effective colorectal cancer surgery, understand Japanese-style procedures, and learn therapeutic strategies. In addition, efforts were made to develop human resources who will later serve as local trainers—an essential resource for training in Thailand. Moreover, the training curricula, ESSQS, and treatment guidelines established by JSES were introduced to the relevant academic societies and teaching hospitals in Thailand with the objective of transferring technical skills to those organizations.

The surgeons who are currently performing colorectal cancer surgery in Thailand are mainly those who have studied or been trained in Western countries. Considering that it is difficult to retrain surgeons who have already established his/her own technique, we targeted the training program at young doctors. Although surgical training is most effective when conducted in the clinical practice, this would have made it impossible to accept a large number of participants. For this reason, we gave lectures on cancer surgery and Japan's latest knowledge and experience and provided surgery simulation training with models.

Target number of participants:

1. Young surgeons: 100 or more
2. Prospective trainers: 10 or more

3.1.3. Goals to be achieved by the Program (business-related goals)

As mentioned above, the issue in Thailand is that the market is still developing and few hospitals and surgeons are capable of performing endoscopic surgery. Our expectation is that the educational program created by this Program for disseminating and developing safe and effective endoscopic surgery will

result in continuous expansion and development of the target market. Setting colorectal cancer as the target disease of the Program would also promote the need for more advanced medical devices.

Generally speaking, of the various medical devices indicated for a given case, healthcare professionals are more likely to adopt those they used in training or those being used by prominent surgeons. We assumed that, by using Japanese leading-edge medical devices in the Program's training, Thai trainers and trainees would be able to obtain knowledge of the safe and appropriate use of such medical devices, as well as to directly experience their performance and efficacy while receiving hands-on guidance from Japanese trainers. We supposed that such use experience had the potential to lead to increased recognition of Japanese medical devices.

Moreover, because King Chulalongkorn Memorial Hospital and Siriraj Hospital (the Thai Program Organizers) as well as the surgeons affiliated with them play a leading role in medical care in Thailand, we expected that the adoption of Japanese leading-edge medical technologies by the Thai Program Organizers, if realized, would have a good model on the entire Thai market.

Specific benefits of the Program are unlikely to manifest in the short term, but we hope that the outcomes of the Program will lead to the continuous market expansion over the medium to long term.

3.2. Description of Program implementation

3.2.1. Implementation schedule

Six sessions of training on endoscopic surgery for colorectal cancer were held during the period from May 2015 to January 2017. We planned to hold one session of Japanese Site Training and five sessions of Thai Site Training (in Bangkok).

Session No.	Scheduled timing	Activity description	Type of training	Training site	Number of participants (planned)	Intended participants
1	May 2015	Training course (2 days)	Thai Site Training	Siriraj Hospital	> 20	Beginners at endoscopic surgery (hereinafter, "beginners")
2	September 2015	Training course (2 days)	Thai Site Training	King Chulalongkorn Memorial Hospital	> 20	Beginners
3	January 2016	Lectures, tours (hospital facilities and operating room), hands-on training (5 days)	Japanese Site Training	Oita University Hospital Olympus	12	Surgeons with experience in endoscopic surgery
4	June 2016	Training course (2 days)	Thai Site Training	Siriraj Hospital	> 20	Beginners
5	September 2016	Training course (2 days)	Thai Site Training	King Chulalongkorn Memorial Hospital	> 20	Beginners

6	January 2017	Training course (2 days)	Thai Site Training	Siriraj Hospital	> 20	Beginners

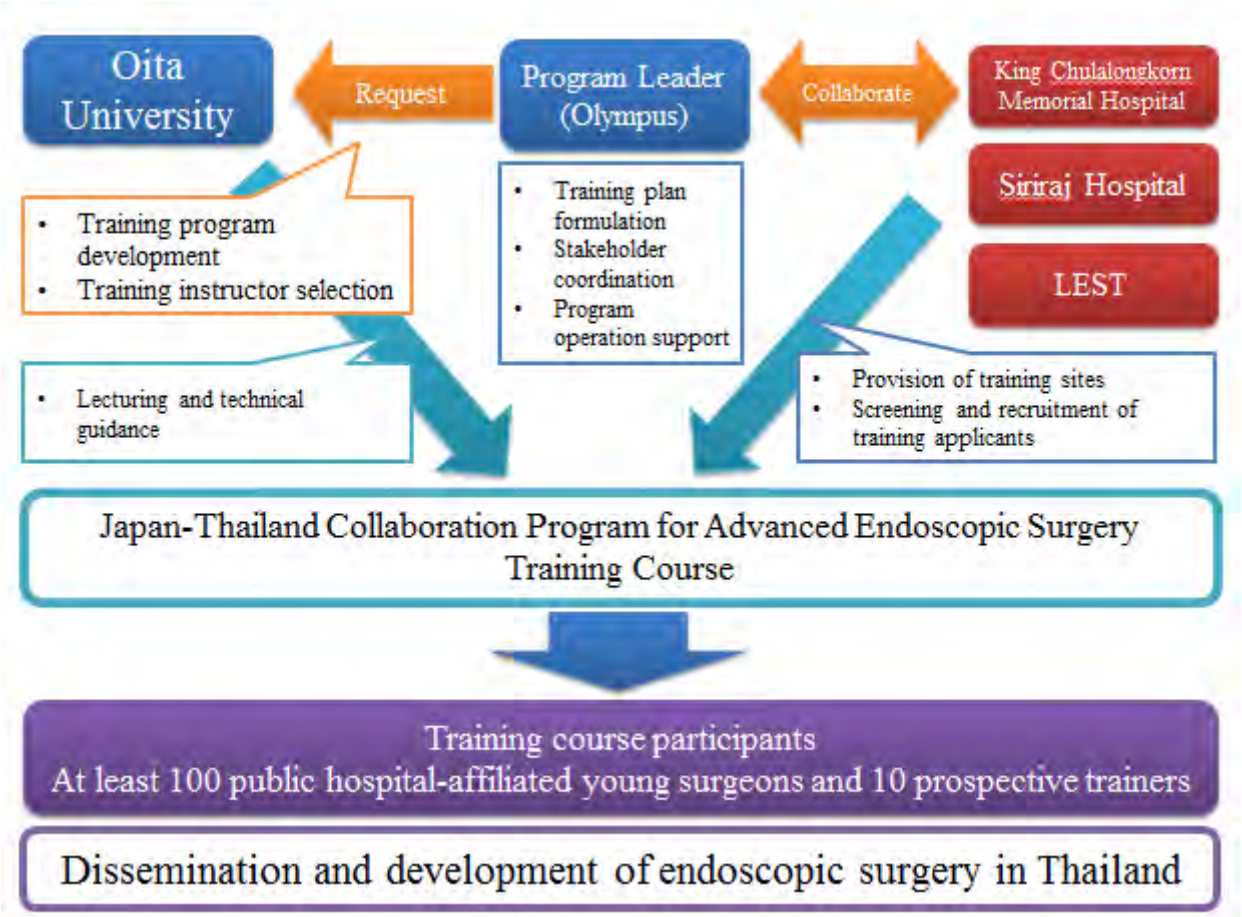
3.2.2. Program organization

The organization illustrated below was established to carry out Program activities, which consisted of six sessions.

The Program Leader and their subsidiary in Thailand formulated a Program implementation plan, coordinated with stakeholders, and provided support for Program operation.

The development of training course curricula and programs, as well as lectures and technical guidance, was conducted by Oita University, which had received an endorsement from JSES.

The Program Leader partnered with King Chulalongkorn Memorial Hospital and Siriraj Hospital (the Thai Program Organizers) to use their training centers as training sites (In Japan, there are only a few surgical training centers, which is capable of holding the large scale training course. Both training centers of the Thai Program Organizers are seen as the suitable sites, since they are the top rank training centers in Asia in terms of facility's infrastructure and equipment). In addition, we obtained cooperation from both hospitals and LEST in the recruitment and screening of applicants for participation in the training courses.



3.2.3. Description of implementation

Training on endoscopic surgery for young Thai surgeons seeking to learn colorectal cancer surgery was conducted in Bangkok in accordance with the JSES training curriculum. The qualification of the participation in the training is that the trainees are required to have the experience of colorectal surgery (either open or endoscopic surgery) and to be screened by LEST. The training was conducted as a 2-day training course. On the first day, participants attended lectures, as well as hands-on training with dry models on basic surgical techniques and on the appropriate use of Japanese medical devices. On the second day, the trainees attended surgery simulation training with cadaver models using Japanese medical devices (It is a typical training style in Japan that mainly composed of lecture for surgical procedure, anatomy, etc. and hands on training. Young surgeon is the target of this project and we increased a volume of hands on training with a model that is a basic to learn manipulation of hand instruments in addition to basic lectures.).

In addition, Japanese Site Training was provided to prospective trainers. During the Japanese Site Training, the trainees were lectured on endoscopic surgery, which included endoscopic surgery for colorectal cancer, toured operating rooms of various endoscopic surgical procedures, and engaged in a lecture session at Oita University. Subsequently, the participants traveled to the Program Leader's training center, where they received a presentation on leading-edge technologies and medical devices, and then used endoscopic equipment to experience their specifications, performance, and the like.

Task No.	**Task Program items to be implemented for business development**	**Activity schedule**						**Description**	**Goal (expected result at Program completion)**
		#1 Thai Site Training	**#2 Thai Site Training**	**#3 Japanese Site Training**	**#4 Thai Site Training**	**#5 Thai Site Training**	**#6 Thai Site Training**		
1.	Implementation JSES-style training and introduction on Japanese leading-edge technologies to young surgeons							Provide five sessions of JSES-style training to 20 trainees per session in Bangkok. Conducted a questionnaire survey, etc., to review the contents of the provided training and support continuous improvement.	1. Provide training to 100 trainees 2. Grant the certificates of participation by JSES; monitor and follow-up of effects of the training
2.	Implementation of Japanese Site Training and introduction on Japanese leading-edge technologies to Thai surgeons with future potential as trainers							Deepen understanding of the JSES training curricula, as well as awareness and knowledge of how to develop endoscopic surgery specialists and provide guidance on	1. Develop 10 prospective trainers 2. Monitor and follow-up of effects of the training 3. Introduce JSES-style training at Thai

			endoscopic surgery.	hospitals
3.	Discussion of technical transfer (e.g., transfer of JSES-style schemes, including training curricula, ESSQS, and guidelines)		Raise the awareness of relevant academic societies and inform hospitals of JSES-style training and encouraged those organizations to introduce the training.	Introduce JSES-style curricula into daily training, specialized education, and the like
4.	Survey of the Thai surgeon development system; planning of marketing strategies		Consider marketing strategies to establish based on the survey of the surgeon development system.	Finish preparing marketing strategies based on market structure analysis
5.	Planning of differentiation strategies based on non-price competition		Plan and introduce sales policies based on non-price competition.	Implement trial and sales policies based on non-price competition
6.	Planning of energy device sales strategies		Plan sales strategies for competing with leading two manufacturers.	Plan and implement of sales strategies

Chapter 4 Results of Program Implementation

As King Bhumibol Adulyadej passed away in October 2016, the Program period was extended to May 2017, and all planned operations were completed no later than the end of the extended period.

4.1. Task #1: Provision of JSES-style training and briefing on Japanese leading-edge technologies to young surgeons

4.1.1. Brief description of implementation

Session #1	Period: Training site: Trainers:	June 28 to July 1, 2015 SiTEC Masafumi Inomata (Professor, M.D.), Tsuyoshi Etoh M.D., Yukio Iwashita M.D., Takahiro Hiratsuka M.D., Shinichiro Enpuku M.D., Department of Gastroenterological and Pediatric Surgery, Oita University Faculty of Medicine
Session #2	Period: Training site: Trainers:	September 16 to 17, 2015 CSCSTC Masafumi Inomata (Professor, M.D.), Hidefumi Shiroshita M.D., Yoshitake Ueda M.D., Takahiro Hiratsuka M.D., Tomotaka Shibata M.D., Department of Gastroenterological and Pediatric Surgery, Oita University Faculty of Medicine
Session #3	Period: Training site: Trainers:	June 14 to 15, 2016 SiTEC Masafumi Inomata (Professor, M.D.), Yuichi Endo M.D., Masaaki Tajima M.D., Tomonori Akagi M.D., Kentaro Nakajima M.D., Department of Gastroenterological and Pediatric Surgery, Oita University Faculty of Medicine
Session #4	Period: Training site: Trainers:	March 21 to 22, 2017 SiTEC Masafumi Inomata (Professor, M.D.), Yuichi Endo M.D., Tomonori Akagi M.D., Kentaro Nakajima M.D., Hajime Fujishima M.D., Department of Gastroenterological and Pediatric Surgery, Oita University Faculty of Medicine
Session #5	Period: Training site: Trainers:	May 30 to 31, 2017 CSCSTC Masafumi Inomata (Professor, M.D.), Yohei Kouno M.D., Tomonori

		Akagi M.D., Teijiro Hirashita M.D., Hiroomi Takayama M.D., Department of Gastroenterological and Pediatric Surgery, Oita University Faculty of Medicine Tomohisa Uchida M.D., Department of Forensic Medicine, Oita University Faculty of Medicine

* Participant information is given in Appendix 7.

4.1.2. Training programs

4.1.2.1. Lectures

Lectures were given by Japanese trainers as well as by faculty affiliated with the Thai Program Organizers (King Chulalongkorn Memorial Hospital and Siriraj Hospital). To promote the dissemination and development of safe and effective endoscopic surgery, the Program objective, lectures with questions and answers between the trainees and the trainers were given in accordance with the JSES training curriculum.

Trainer's lecture (Prof. Inomata)

Trainer's lecture (Dr. Vitoon, Siriraj Hospital)

Questions and answers between trainees and trainers

4.1.2.2. Video clinics

“Video clinics” were started from the second and held subsequent sessions of the Thai Site Training. In the video clinics, trainees showed videos of endoscopic surgery they had performed by themselves at the affiliated hospitals, and the trainers provided comments. That is because we realized that the experience of endoscopic surgery as well as the skill level varied from trainee to trainee when we held the first training session, from which we learned to employ the informative topics of the lectures and the individual instruction at the hands-on training in order to make the training effective for each trainee. By showing real surgeries performed by the trainees, we aimed to give instruction focused on more practical and specific surgical strategies and points to be noted. It was hoped that the more experienced trainees were motivated by evaluation of their surgical skills, and trainees also had a chance to review specific examples of good and bad procedure. The presented surgical video showed that trainees were carefully performing surgery while bearing in mind that their surgery would be commented on.

Nevertheless, some of the videos showed forceps being manipulated in ways that could have damaged the organ. Thus, the trainers gave specific advice that would help the trainees to improve their skills, including how to manipulate the forceps and endoscope to ensure a safe and appropriate operative field, as well as precautions when using an energy device. The video clinics provided benefits to the trainees who made a presentation as the trainers' advice helped them to become aware of what to improve and what to do to enhance their skills.

4.1.2.3. Technology introduction of Japanese leading-edge devices

The Program provided a briefing on 3D and 4K surgical endoscope imaging systems and energy devices used in the Program training. The objective of the technology introduction was to help the Thai participants to understand the principles of each device’s technology and how to use them appropriately; and to use the devices properly and safely during subsequent hands-on training and during subsequent surgery at the hospitals to which they belonged. While being provided with practical coaching, the trainees received similar advice from the trainers again, allowing them to safely perform the procedures while reviewing the important points.

4.1.2.4. Hands-on training

4.1.2.4.1. Dry lab training (Hands-on training with training boxes)

The trainees were divided into several groups, learning forceps manipulations essential for endoscopic surgery, such as suturing, dissection, grasping, and cutting. The trainers coached the trainees according to their respective skill levels, describing and demonstrating the points to bear in mind and tips for performing each manipulation. By placing tubes perfused with a liquid simulating blood in a training box to serve as vessels, ingenuity was exercised so improper hemostasis resulted in hemorrhage. This allowed trainees to practice surgery feeling as if they had been performing actual surgery.

Photo of dry lab practical training

Photo of dry lab practical training

4.1.2.4.2.Wet lab training (Hands-on training with cadaver model)

During the wet lab training, both trainers and trainees were divided into several groups to practice various procedures, including laparoscopic right hemicolectomy, laparoscopic lower anterior resection, laparoscopic transverse colectomy, and laparoscopic sigmoidectomy (due to skill level variation among the trainees, the progress of the training varied from group to group, so learned procedures also varied from group to group). The instructors provided guidance on procedures based on anatomy and oncology. Using Japanese leading-edge devices (3D and 4K surgical endoscope imaging systems and energy devices), the instructors provided guidance on the safe operation of equipment according to the characteristics of each product. During this training, all trainees worked very hard, demonstrating an enthusiasm to take advantage of the opportunity to acquire appropriate skills.

In addition to the learning of techniques, the wet lab training achieved another important outcome: by performing this simulated surgery, the trainees figured out that everyone's understanding the team work of the surgical procedure is important for successful cooperation between the operator, camera man (assistant who manipulates the endoscope), and other assistants.

Photo of wet lab training

4.1.3. Results of the questionnaire on each training course program to trainees (satisfaction evaluation)

We conducted a satisfaction survey from the second training course. We confirmed that trainees rated the training highly, with a mean rating score of 4.7 (with 5 representing the highest level of satisfaction), as shown in the figure below.

When asked about their reason for participating, many answered that they wanted to learn to perform endoscopic surgery as principal operator. The high level of satisfaction is attributed to the fact that all trainees were able to play the role of principal operator in the wet lab.

In the free comment field of the questionnaire, the following comments were received: “It was really an excellent training course. I want to participate again in the next course,” “I learned measures for dealing with difficult situations from the Japanese and Thai trainers,” and “I hope more young surgeons participate in the future.”

Trainees’ satisfaction evaluation result of the training course (Average between 2nd to 6th)

Training course	Lecture	Dry-Lab/ Video clinic	Wet-Lab	Overall
Average score	4.6	4.5	4.7	4.7

4.2. Task #2: Provision of Japanese Site Training and introduction of Japanese leading-edge technologies to Thai prospective trainers

On Monday, January 25, 2016, the opening ceremony of the Japanese Site Training was held in the presence of Dr. Kyoichi Ohashi, Vice President (Director in charge of research, international affairs, and medical care) of Oita University, Dr. Masatsugu Moriyama, Dean of Oita University Faculty of Medicine, and Mr. Koichi Takizawa, Division Director at JICA Kyushu. Dr. Ohashi provided a briefing on Oita University's international collaboration activities of recent years, in particular, inter-university exchange with Chulalongkorn University and Mahidol University. Mr. Takizawa provided a briefing on JICA's international exchange initiatives and expressed his hopes for the Japanese Site Training. Dr. Pawan

Chansaenroj expressed their gratitude on behalf of the 12 trainees, and the 1-week training began.

4.2.1. Brief description of Japanese Site Training

Overview	Period:	January 24, 2016 to January 30, 2016
	Training site:	Oita University Hospital, Ishikawa Facility, Olympus Corporation
	Trainer:	Masafumi Inomata (Professor, M.D.), Yukio Iwashita M.D., Masaaki Tajima M.D., Yuichi Endo M.D., Masayuki Ohta M.D., Tsuyoshi Etoh M.D., Hidefumi Shiroshita M.D., Kazuhiro Yada M.D., Manabu Tojigamori M.D., Hiroki Uchida M.D., Yoshitake Ueda M.D., Tomotaka Shibata M.D., Kentaro Nakajima M.D., Department of Gastroenterological and Pediatric Surgery, Oita University Faculty of Medicine

* Participant information is given in Appendix 7.

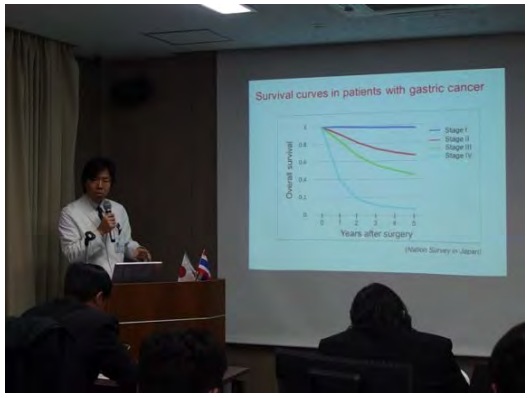
4.2.2. Training programs

4.2.2.1. Lectures

The trainees attended lectures on the latest Japanese procedures and trends concerning endoscopic surgery for colorectal cancer (the target disease of the Program), upper gastrointestinal cancer, hepatic cancer, biliary tract cancer, pancreatic cancer, and bariatric surgery, including endoscopic submucosal dissection (ESD). In addition, the trainees learned about the JSES Skill qualification system and Japanese cancer screening systems.

The trainees were also given a briefing on laparoscopic assisted distal gastrectomy, which Dr. Seigo Kitano, President of Oita University and a leading authority on laparoscopic gastrointestinal surgery in Japan, performed on early gastric cancer in 1991 for the first time in the world.

Facilities tour (Oita University Hospital)



Trainer's lecture (Dr. Etoh)

4.2.2.2. Tours of operating rooms and hospital facilities

Tours were held at Oita University Hospital. On the first day, the trainees observed the clinical cases for

laparoscopic sigmoidectomy and laparoscopic hepatectomy. Dr. Etoh, “principal operator”, provided commentary on each step of the procedures. The trainees seemed to be deeply impressed by his careful procedure. In addition, these tours provided the trainees an opportunity to actually observe the layout of operators and equipment around the bed—the positioning of the surgeon, assistants, camera-man, and nurses, as well as the positioning of devices and consumables used for endoscopic surgery—thereby contributing to a deeper awareness of the importance of such a layout for efficient and safe surgery. Although Thailand has many patients with hepatic disorder, most of the trainees had no experience in laparoscopic hepatectomy. They therefore concentrated on observing the procedure, showing a heightened interest.

The following day, the trainees observed laparoscopic assisted distal gastrectomy and laparoscopic sleeve gastrectomy. Dr. Etoh, the operator of the first day's procedures, performed laparoscopic assisted distal gastrectomy as well and explained important points to the procedures. During the case of the laparoscopic sleeve gastrectomy, several questions, including the following, were asked and answered:

Q: I wonder if GERD might be worse by performing laparoscopic sleeve gastrectomy.

A: We perform this procedure when we confirm that GERD is not so severe.

Q: Which anastomosis is used?

A: The Roux-en-Y method.

The trainees understood the importance of performing a postoperative check for complete closure of the anastomotic region by an upper GI endoscope.

During the hospital facilities tour, the trainees visited the operating theaters, wards, emergency rooms, intensive care units, heliport for helicopter emergency medical service, and gastrointestinal endoscopy center. The trainees showed an interest in the workflow for accepting patients brought to the hospital by ambulance and the system allowing the monitoring from the central monitoring room of examinations being performed at the endoscopy center. It was the tidiness throughout the hospital, including outpatient areas (waiting rooms, areas adjacent to Doctor's offices), that attracted the greatest attention and amazement from the trainees. This tidiness stands in contrast with the chaotic atmosphere in hospitals in emerging countries (in particular, government-run hospitals), which are packed with patients and their family members, though this is less true of hospitals in Thailand. The Program did not cover matters related to hospital management, including the layout of persons and objects in operating theaters and an efficient patient flow across the hospital, but these matters would be appropriate as themes for future training. The trainees also visited the Surgical Operation Laboratory for Innovation and Education (SOLINE), established by Oita University in 2015. The participants were provided a briefing on the background to SOLINE's establishment, as well as its current usage.

4.2.2.3. Presentation on Japanese leading-edge technologies

The trainees traveled from Oita to Tokyo and were provided a briefing on leading-edge technologies related to endoscopic surgery at the training center in the technology development center of the Program

Leader in Hachioji. The information provided focused on the 4K and 3D surgical endoscope imaging systems and energy devices used in the training program, including their principles, efficacy, and appropriate use for safe treatment.
In addition, the trainees visited the "Zuikodo," a pavilion at the center exhibiting historical products, where they observed previous generations of endoscopes and microscopes. Taken through by guide, they observed the world's first practical gastrocamera, rigid gastroscopes used in earlier times, and other exhibits. We believe the trainees' visit to the technology development center provided opportunity for them to further develop a sense of affinity to Japanese technologies and products.

4.2.2.4. Reception held by Oita University

After completion of the second day's program in Oita, Oita University held reception, which was attended by Oita University staff, including Dr. Kitano (President) and Dr. Moriyama (Dean of the Faculty of Medicine), who served as trainers in the Program training, as well as trainers of the respective training courses, with cooperation from the International Office of Oita University. Through questions and answers about the training, as well as the exchange of information on a range of topics, not limited to the themes of the Program, the university staff and the trainees in the training deepened their acquaintance with each other.

4.2.3. Hands-on Training

4.2.3.1. Dry lab training (Hands-on training with training boxes)

Four trainers affiliated with Oita University traveled to Tokyo and conducted hands-on training at the training center of the Program Leader. First, dry lab training was conducted so that the trainees could warm up and the trainers could check on their skills. Using training boxes, the trainees practiced suture manipulation and peeling grapes with a pair of forceps. After Dr. Iwashita, a trainer, had demonstrated suturing, the trainees practiced the procedure while receiving advice from the trainers. Most trainees in this training course were more experienced than those in the Thai Site Training Course, demonstrating a higher skill level.

4.2.3.2. Wet lab training (Hands-on training with live model)

The participants were divided into four groups, each assigned to one table, and practiced lower anterior resection. The participants had never used a 4K surgical endoscope imaging system until their participation in the Program. They seemed unable to hide their surprise at the ultra high-definition endoscopic images being displayed on a 55-inch large monitor screen. The training progressed smoothly as expected, and some groups completed the aforementioned procedure earlier than scheduled. These groups practiced other procedures such as hepatectomy and cholecystectomy. All groups completed the task no later than the scheduled closing time.

Photo of dry lab practical training

Ceremonial photograph (trainers and participants)

4.3. Task #3: Technical transfer (e.g., transfer of JSES-style schemes, including training curricula, ESSQS, and guidelines)

Throughout the training, Thai participants received lecture on the ESSQS of the JSES, and on the JSES Guidelines for Performing Endoscopic Surgery.

The lecture on the ESSQS described the series of steps required for certification, from application to assessment, and the assessment criteria. Both Thai trainees and Thai trainers expressed surprise at the rigorousness of the assessment, which had a very low pass rate. Prof. Inomata then gave a lecture in quiz format about the manipulation of hand instruments for laparoscopic surgery. Specifically, the trainer showed two videos (available at the JSES website) of the same procedure—one of an example that had passed the assessment, and the other of an example that had failed—and then quizzed the trainees on which video showed a good example and asked them to answer. Thai participants asked questions, including the following, demonstrating a heightened interest in the surgeon ESSQS:

- How long does it take for a newly licensed doctor to become a certified laparoscopist?
- How many surgeons are certified?
- How many surgeons undergo the assessment per year? What percentage point of the examinees pass the assessment?

Dr. Jirawat Pattana-Arun of King Chulalongkorn Memorial Hospital (head of the colorectal surgery department) expressed his intention to incorporate details of the JSES Skill qualification system into the hospital's residency program, and then to verify the advantages of such an initiative and request the Thailand Society of Colorectal Surgery to consider to adopt the JSES Skill qualification system.

Likewise, Dr. Vitoon Chinswangwatanakul of Siriraj Hospital (head of the MIS and colorectal surgery departments) expressed his intention to endeavor to standardize various educational programs given for endoscopic surgery in Thailand.

Trainer's lecture (Prof. Inomata)

4.4. Task #4: Survey of the surgeon training system in Thailand

We investigated the current state of the surgeon training system in Thailand by conducting on-site survey to both trainees and trainers.

Under the surgeon training system in Thailand, newly licensed surgeons receive 1-year initial clinical training at public hospitals in rural area and then undergo specialized training at teaching hospitals. The Royal College of Surgeons of Thailand introduced MIS training into general surgery residency program in 1998, and changed the period of that residency program from 3 years to 4 years accordingly. During this MIS training, residents perform laparoscopic cholecystectomy, a basic MIS procedure. Subsequently, in 2010, fellowship program for surgeons seeking to acquire certification as a specialist in a subspecialty (e.g., MIS, colorectal surgery) were started at three top teaching hospitals (King Chulalongkorn Memorial Hospital, Siriraj Hospital, and Rajavithi Hospital).

Surgeons with these subspecialties become local prospective trainers in the future.

The residency program is conducted by each teaching hospital so we realized that there were no standardized residency programs in Thailand.

Chapter 5 Program Summary (Evaluation of Implementation Results)

5.1. Program outcomes (contribution to the target country/region/city)

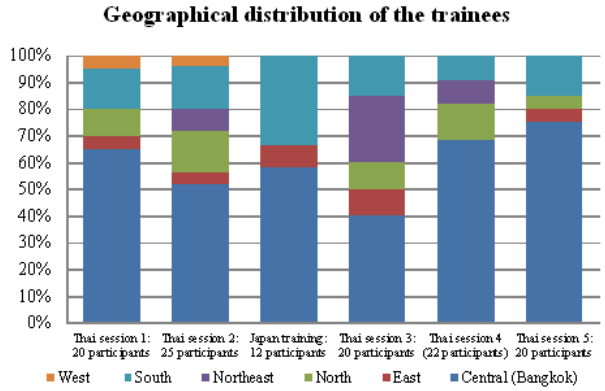
A total of 119 surgeons affiliated with 37 hospitals throughout Thailand participated in a total of six training sessions (Thai Site Training Course and Japanese Site Training Course). The actual number of participants in the training course for young surgeons exceeded the target figure. On the other hand, the number of participants in the training course for prospective trainers was no more than six, fewer than the target figure of 10. Ten surgeons originally planned to join the program for prospective trainers, but four of ten surgeons could not join due to emergency operations in their hospital. As described below, it was declared that Thai Society would introduce JSES style educational program, so it is expected that training for prospective trainer will be continuously held by Thai society from now on.

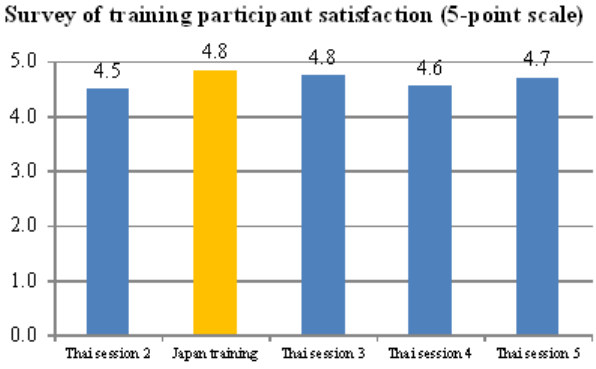
We received positive feedback reflecting a high degree of satisfaction from using Japanese leading-edge medical devices during both training courses. The following comments were received regarding the 3D surgical endoscope imaging system:

“I was able to confirm the surgical plane for dissection more precisely thanks to my increased spatial understanding”, “I was able to manipulate the forceps more precisely and safely,” and “I was able to perform difficult suture manipulations easily.” For the 4K surgical endoscope imaging system, there was a comment that the trainee was able to perform surgery more precisely and safely thanks to their new ability to recognize microanatomy, made possible by an image quality with higher definition and color reproducibility than they had ever seen before. In addition, it was commented that the size of the newly introduced 55-inch monitor caused no problem for operation. Regarding the device combining bipolar and ultrasound energies, comments were obtained observing that the device’s grasping power was higher than that of the conventional product, its vessel sealing performance was equivalent to that of sealing devices, and its cutting speed was fast. There was also an opinion that they expected integrated bipolar-and-ultrasonic energy device to shorten operation time by reducing the frequency of switching between forceps and devices.

The trainees in the Japanese Site Training were candidate prospective trainers at teaching hospitals, and the trainees acquired a deeper understanding of various matters, including topics related to leading-edge endoscopic surgery in Japan, as well as the JSES-style training curricula, ESSQS, and guidelines. In addition, the trainees worked on numerous tasks, including learning the latest Japanese procedures and technologies and exchanging opinions on medical devices.

Intended participants	Target Number	Actual
Young surgeon	≥ 100	113 in total
Surgeons with future potential as trainers	≥ 10	6 (Several surgeons who had intended to participate were absent for reasons of the hospitals they are affiliated with.)





We conducted a follow-up survey and obtained answers from 12 trainees. We confirmed that four trainees, who had completed the MIS specialist or colorectal surgery specialist training program, have increased the number of endoscopic surgeries for colorectal cancer as principal operator after their participation in the training program. The remaining eight trainees responded that they had gained confidence in their ability to participate in surgery as an assistant or a camera-man. They commented that the training course was beneficial because they were able to learn the clinical expertise, such as anatomy, and appropriate use of equipment needed for endoscopic surgery, and gained experience as principal operator through the wet lab.

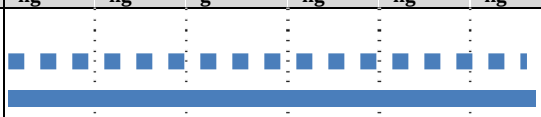
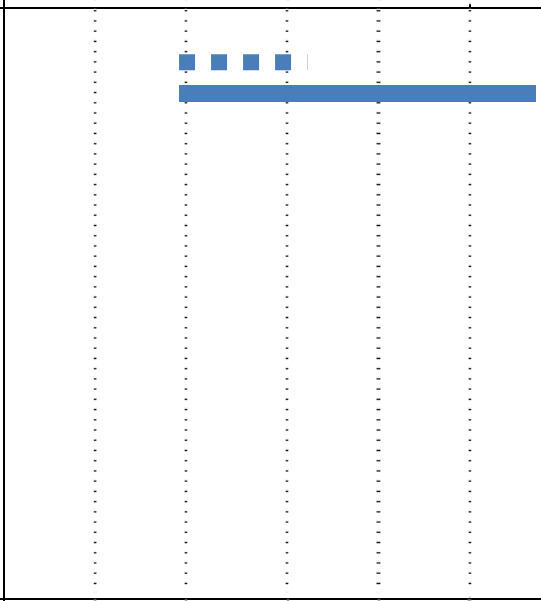
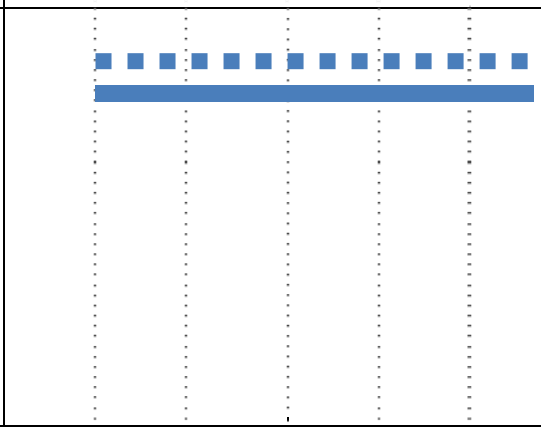
Considering that trainees in the Program training were surgeons affiliated with Thailand's leading teaching hospitals—King Chulalongkorn Memorial Hospital, Siriraj Hospital, Rajavithi Hospital, Thammasat University, Chiang Mai University, and Prince of Songkla University—we expect these surgeons will make efforts to disseminate endoscopic surgery to peripheral hospitals in the future, which reflects output from this training.

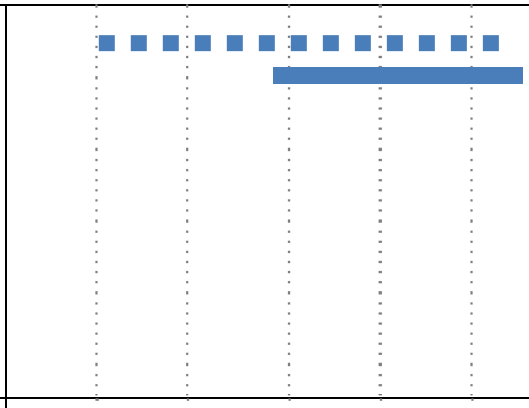
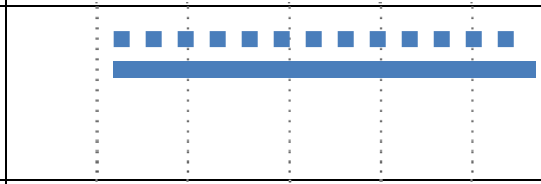
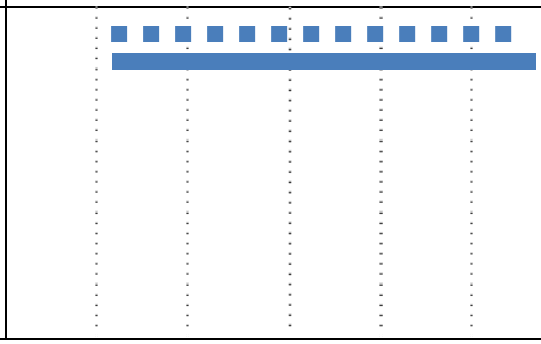
At the closing ceremony, held during the final Thai Site Training session, both Thai Program Organizers expressed their intention to consider introducing in Thailand JSES-style schemes, including the training curricula, ESSQS, and guidelines.

Dr. Jirawat Pattana-Arun, belongs to King Chulalongkorn Memorial Hospital (head of the colorectal surgery department of the hospital), expressed his intention to incorporate details of the JSES Skill qualification system into the hospital's residency program, and to then verify the advantages of such an initiative and apply it to the Thailand Society of Colorectal Surgery to consider introducing the JSES Skill qualification system.

Next, Dr. Vitoon Chinswangwatanakul, affiliated with Siriraj Hospital (head of the MIS and colorectal surgery departments of the hospital), expressed his intention to endeavor to standardize various educational programs for endoscopic surgery in Thailand. Dr. Vitoon Chinswangwatanakul emphasized that the standardization would require collaboration among all stakeholders in Thailand as well as cross-sector and international collaboration (e.g., between JSES, JICA, MESDA, ELSA, Japanese industry) to be continuously implemented.

5.2. Program outcomes (business-related outcomes), as well as unresolved issues and policies for their resolution

Task No.	Task Program items to be implemented for business development	Activity schedule and result						Achievement and evaluation		Unresolved issue and policy for resolution
		#1 Thai Site Training	#2 Thai Site Training	#3 Japanese Site Training	#4 Thai Site Training	#5 Thai Site Training	#6 Thai Site Training			
1.	Implementation JSES-style training and introduction on Japanese leading-edge technologies to young surgeons							Completed	1) Distributed a certificate of participation to 113 trainees in total. 2) Provided a briefing on Japanese leading-edge techniques and technologies in each training course. → The goals were achieved.	A request to hold training courses on a continuing basis was received from many of the trainees. → We will consider how we could respond to this request
2.	Implementation of Japanese Site Training and introduction on Japanese leading-edge technologies to Thai surgeons with future potential as trainers							Completed	1) Distributed a certificate of participation to six trainees. 2) Confirmed that four surgeons sampled from the participant population were performing endoscopic surgery to an increasing number of cases. 3) Confirmed that Thai Program Organizers had an interest in and willingness to introduce JSES-style training. → The goals were achieved.	Same as above.
3.	Discussion of technical transfer (e.g., transfer of JSES-style schemes, including training curricula, ESSQS, and guidelines)							Completed	1) Provided lectures by Japanese experts in the respective training courses. 2) Both Heads in MIS and colorectal surgery in Thailand declared their intention to make efforts to introduce JSES-style schemes. → The goals were achieved.	Follow-up, as well as support for strengthening Japan-Thailand cooperation, needs to be considered.

4.	Survey of the Thai surgeon development system; planning of marketing strategies		Completed	1) By surveying the surgeon development system in Thailand, key teaching hospitals were identified. 2) Target customers were set by implementing market segmentation. → The goals were achieved.	An action plan per market segment should be clarified to ensure steady business development.
5.	Planning of differentiation strategies based on non-price competition		Pending	Measures for selling plans (e.g., service plan, package sales plan) are being formulated and developed.	Measures to respond to the revised bidding system are being considered.
6.	Planning of energy device sales strategies		Pending	Following the completion of competitor analysis, initiatives have been started to establish a sales force	We need to acquire necessary business know-how and strengthen specialized medical education on a continual basis.

Chapter 6 Business Development Plans after Program Completion

6.1. Business objectives and goals

6.1.1. Outcomes expected from business development (contribution to socioeconomic development of the target country/region/city)

As previously mentioned, this Program has increased the skill level of endoscopic surgery to the trainees and the awareness for Japanese medical equipment in Thailand by providing training to young surgeons and prospective trainers, which we see as the direct results. Besides this direct outcome, however, we expect that if King Chulalongkorn Memorial Hospital and Siriraj Hospital, leading teaching hospitals in Thailand, adopt the JSES-style training curricula which they experienced through the Program period, this would promote continued surgeon development as well as the dissemination of safe and effective endoscopic surgery across the country. In addition to these two hospitals, Rajavithi Hospital also regularly holds training course sessions not only for residents but also for the other surgeons, including those from foreign countries. We particularly hope that this initiative will contribute to the development of surgeons in countries in the Mekong region which includes Thailand. It is said that not only efforts by surgeons but progress of medical devices have been contributing to development of endoscopic surgery. As a Japanese manufacture, we continue to improve awareness and reliability of Japanese products by introducing Japanese latest technology and training for proper use of products continuously.

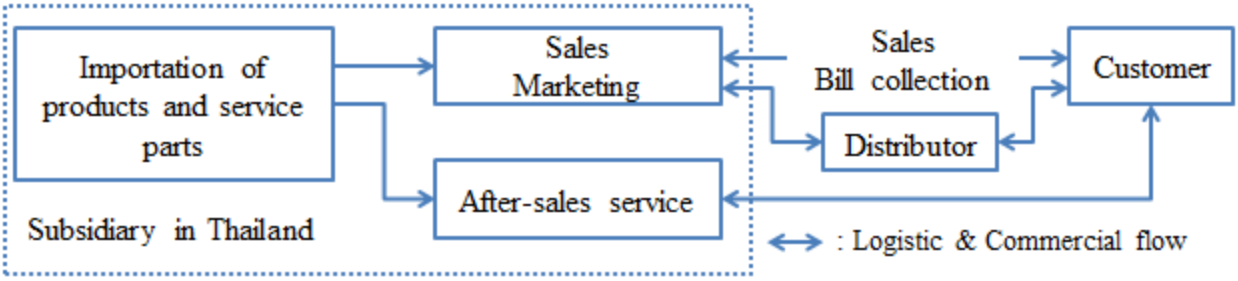
The advantages of endoscopic surgery over open surgery are as described above. For example, the following are expected: improvement of patient QOL; contribution to medico-economic performance; and improvement of accessibility to medical care, particularly in rural areas.

Meanwhile, there is great expectation that the Program will contribute to solve a social development challenges; specifically, an increased interest in colorectal cancer management would lead to the expansion of social efforts to develop countermeasures against colorectal cancer. Colorectal cancer is recognized as a curable cancer, and in Japan, the U.S., and Europe, awareness building activities are widely carried out to ensure early detection and treatment of this cancer. General surgeons and colorectal surgeons in Thailand have received training on surgical procedures as well as training on other diagnostic and therapeutic techniques such as colonoscopy. We hope that endoscopic surgery outcomes will increase survival for patients with colorectal cancer and also that the development of endoscopic surgery will encourage efforts to eradicate colorectal cancer.

6.2. Business development plan

6.2.1. Business overview

While we do use a local distributor in some regions, we have a local subsidiary that is directly involved in sales and service provision using our own resources. As we have no production sites in Thailand, we import and stock products, repair parts, and the like, with which we market, sell, and provide goods and services to customers.



6.2.2. Business target

We target both public and private hospitals located in Thailand (about 1,200 hospitals). According to our own estimation (no statistic or similar data is available), the scale of the market of products related to our business is approximately 6 billion yen (estimation for 2015; 55 million U.S. dollars). Depending on the target region or field, an annual average growth rate of 4–10% is expected.

6.2.3. Business implementation organization

Our local subsidiary directly engages in importation, marketing, sales, after-sales service, and bill collection, using our own resources. We have a repair service center as well, thereby ensuring a sutructure that allows all maintenance and repair services to be performed in Thailand.

Market needs are the solutions to challenges and problems that hospitals and healthcare professionals face every day. To solve them, medical device manufacturers require the continuous improvement of their resources. Establishing the training center in Bangkok, it helps enhance the competency of our sales and service staff and our distributors in not only Thailand but also ASEAN countries through periodical training courses. The training center runs the training courses for co-medical staff, in which the participants learn maintenance and trouble-shooting of equipment. Especially when new equipment is launched, we provide the training for proper use of equipment in order to support the safe and effective introduction of technologies.

6.2.4. Business development schedule

In accordance with the medium to long-term sales strategies (five-year plan from FY2017 to FY2021), we will formulate an action plan for each fiscal year to carry out activities. We plan the concrete action plan at the beginning of fiscal year and implement it, which is based on corporate strategic plan and key initiatives set by business unit or market segment. We will use an annual plan and activity goals as indicators, and in case we consider it hard for us to achieve any goal, we will immediately formulate countermeasures and take corrective actions.

6.2.5. Investment and financial plans

Large-scale investments based on the medium to long-term plan have been completed. In May 2016, we set up our own training center called T-TEC near Suvarnabhumi International Airport, Bangkok. The

T-TEC building has four above-ground stories and a total floor area of 4,900 m^2. T-TEC includes a repair service center, as well as facilities that accommodate in-house training (for sales/servicing personnel) and training for nurses, BMEs, and physicians on the appropriate use of products, maintenance services, and the like. T-TEC's mission covers ASEAN markets as a whole, including Thai domestic markets.
We will continue to make investments necessary for the business development, including those in human resource, on a normal basis in accordance with the medium to long-term plan.

6.2.6. Issues related to business development and policies for their resolution

Compliance with the revised bidding system in the public hospital market is an immediate issue. However, since the impacts of the bidding system on our business as a whole and many other factors are still unclear, we will consider these matters and formulate countermeasures going forward.
On the other hand, many technologies as well as medical devices continue to evolve constantly, and in this context, we cannot expect to achieve stable growth simply by relying on technologies and products alone. We need to create added value that is capable of meeting customer needs and solving issues—after-sales service is the prime example of such added value—as well as to establish an operating system capable of providing such added value. We will endeavor to build customers' trust by addressing issues specific to Thailand, based on successful cases in the global market, for example.

6.2.7. Expected risks in business development and countermeasures

Political uncertainty still remains, but the country's history suggests that the impacts of turbulence are not permanent. Therefore, we consider political uncertainty will pose no major risks. We anticipate that additional measures will be implemented to increase transparency—public hospitals might introduce a more rigorous bidding system, for example—but we do not expect the impacts of such measures to be permanent. Hence, the target market should not experience any events that might pose a major risk to future business development.

6.3. Possibility of collaboration with ODA projects

6.3.1. Necessity of a collaborative project

The duration of Program activities was set to no more than 2 years. Although we endeavored to improve the basic infrastructure that would allow Thailand to train endoscopic surgery specialists on its own, continued technical assistance from Japan is desirable. Since, as previously mentioned, the Thai Program Organizers have facilities and equipment ready to be used to develop endoscopic surgery specialists, it would be helpful to expand technical assistance into the ASEAN countries as a whole, especially into the Mekong region which includes Thailand.
On the other hand, in terms of medical care as a whole, the shortage of healthcare professionals, especially surgeons, is serious, and the uneven distribution of healthcare professionals—that is, their concentration on urban areas—is also considered a major issue. From a medium to long-term perspective,

continued support for surgeon development, including educational system improvement, is desired.

6.3.2. Expected business scheme

One possible scheme is technical cooperation in the healthcare field.

6.3.3. Details of the collaborative project

Training and technical transfer related to diagnosis (including screening) and treatment should be continued as countermeasures against colorectal cancer (the Program dealt with surgery for colorectal cancer). Like the Program, the collaborative project would be desirable, which provide training in the target country and training in Japan. Also, it would be beneficial to introduce not only the transfer of medical technology and service but also Japanese latest medical device technology together with medicinal products which contributes the development of medical technology in Japan.

Although exchange and technical assistance involving collaboration between hospitals and the private sector or between hospitals have been implemented in the past, it was difficult to ensure adequate continuity and scale for several reasons, the shortage of funds being foremost among them. For the purposes of advancing the ASEAN Health Initiative as advocated by Prime Minister Abe as well, we hope governments will lend greater support to the development of medical professionals. Also, the industry has to aim to contribute for social development by supporting academic and educational activities of medical societies to enhance healthcare.

Appendixes

Appendix 1

Japan-Thailand Collaboration program for Advanced Endoscopic Surgery Training Course

A Project of Japan International Cooperation Agency (JICA)

29th-30th June 2015

Venue: Siriraj Training and Education Center for Clinical Skills (SiTEC), Siriraj Hospital

29th June 2015

8.30-9.00	Registration	
9.00-9.20	Opening Remarks	Darin Lohsiriwat/Masafumi Inomata
9.20-9.30	Guest Speech	Yasumitsu Kinoshita, JICA/
	Session 1: Basic&Principle of Laparoscopic Colorectal Surgery	**Moderators:Thawatchai Akaraviputh, Masafumi Inomata**
9.30-9.45	Trocar Placement and Instrumentation for Laparoscopic Colorectal Surgery	Shinichiro Empuku
9.45-10.00	How to Maximize Vessel Sealing Devices	Jirawat Swangsri
10.00-10.15	Anatomy for Laparoscopic Colorectal Surgery	Yukio Iwashita
10.15-10.30	Advanced Technology for Laparoscopic Colectomy	Vitoon Chinswangwatanakul
10.30-10.50	Cofee Break	
	Session 2: Technique for Laparoscopic Colectomy: Thailand&Japan Experience	**Moderators: Thawatchai Akaraviputh, Tsuyoshi Etoh**
10.50-11.05	Laparoscopic Sigmoid Colectomy-Thailand Experience	Jirawat Pattana-arun
11.05-11.20	Laparoscopic Sigmoid Colectomy-Japan Experience	Takahiro Hiratsuka
11.20-11.35	Laparoscopic TME: Thailand Experience	Auttaporn Trakarinsanga
11.35-11.55	Laparoscopic TME: Japan Experience	Masafumi Inomata
11.55-13.00	Lunch	
	Session 3: Laparoscopic Hands on in Training Box	
13.00-13.20	Product Presentation: 3D Operating Theater: Intelligent System and Beyond	Chumsin Pannark (Olympus Thailand)
13.20-14.00	Tips&Tricks : How to Use Flexible EndoEye	Olympus Thailand
14.00-16.00	Hands on in Training Box	All Speakers
18.00-21.00	Reception Dinner	All Speakers

30th June 2015

8.30-9.00	Registration	
9.00-9.10	Program Introduction	Vitoon Chinswangwatanakul
	Session 1: Update Status of Laparoscopic Colorectal Surgery	**Moderators: Vitoon Chinswangwatanakul, Yukio Iwashita**
9.10-9.25	Current Status of Laparoscopic Colorectal Surgery-Thailand	Varut Lohsiriwat
9.25-9.40	Current Status of Laparoscopic Colorectal surgery-Japan	Masafumi Inomata
9.40-9.55	Laparoscopic Right Hemi Colectomy-Thailand	Woramin Riensuwarn
9.55-10.10	Laparoscopic Right Hemi Colectomy-Japan	Tsuyoshi Etoh
10.10-10.30	Coffee Break	
	Laparoscopic Colectomy Soft Cadaver Hands on	
10.30-10.40	Lap Orientation	Vitoon Chinswang watanakul
10.40-10.50	Dressing	
10.50-12.00	Hands on	All Speakers
12.00-13.00	Lunch	
13.00-15.30	Hands on	All Speakers
15.30-16.00	Certification & Closing Remarks	Vitoon Chinswangwatanakul

Appendix 2

THE 2nd JAPAN-THAILAND

COLLABORATION PROGRAM FOR ADVANCED ENDOSCOPIC SURGERY TRAINING COURSE

Venue : Chula Soft Cadaver Surgical Training Center,
4th Floor of Pattayapat building, King Chulalongkorn Memorial Hospital

Date : 16th September 2015

8:30 - 9:00	Registration	
9:00 - 9:05	Opening Remarks	: Dean, Faculty of Medicine
		: Assoc.Prof Sophon Naphathorn
9:05 - 9:10	Welcome speech from the faculty	: Jirawat Pattana-arun, MD : Masafumi Inomata, MD
9:10 - 9:15	About JICA Project	: Mr. Yosumitsu Kinoshita (JICA Thailand Office)

Session 1: Basic & Principle of Laparoscopic Colorectal Surgery
Moderator : Masafumi Inomata : Thawatchai Akaraviputh, M.D.

9:30 - 9:45	Trocar Placement and Instrumentation for Laparoscopic Colorectal Surgery	: Tomotaka Shibata
9:45 - 10:00	How I learn to be a good camera people	: Eakarach Lewthanamongkol, MD
10:00 - 10:15	Maximize the benefit of vascular sealing	: Vitoon Chinswangwatanakul, MD
10:15 - 10:40	Tips and Tricks in controlling Flexible	: Olympus Thailand
10:45 - 11:00	Coffee Break	

Session 2: Technique for Colorectal Surgery 1
Moderator : Tomotaka Shibata, MD : Vitoon Chinswangwatanakul, MD

11:00 - 11:15	Stapling anastomosis for lap. Colorectal surgery	: Yoshitake Ueda, MD
11:15 - 12:20	Essential anatomy for lap. colorectal surgery	: Jirawat Pattana-arun, MD
11:20 - 11:35	Laparoscopic right colectomy	: Auttaporn Trakarnsanga, M.D.
11:35 - 12:00	Laparoscopic middle colic artery ligation	: Hidefumi Shiroshita, MD
12:00 - 13:00	Lunch	

Session 3: Technique for Colorectal Surgery 2 & Hands on
Moderator : Yoshitake Ueda, MD : Charnjiroj Thiptanakit, MD

13:00 - 13:20	Product Presentation	: Olympus Thailand
13:20 - 13:35	Laparoscopic take-down splenic flexure	: Songphol Malakorn, MD
13:35 - 13:50	Laparoscopic sigmoidectomy	: Prapon kanjanasilp. MD
13:50 - 14:00	JSES Certification system	: Masafumi Inomata
14:00 - 16:00	Hands-on in training box	: Delegates Group 1
	Video Cases Discussion	: Delegates Group 2

Date : 17th September 2015

8:30 - 9:00	Registration	

Session 1: Update status of LAR Surgery
Moderator : Hidefumi Shiroshita, MD : Jirawat Pattana-arun, MD

9:00 - 9:15	Current status of laparoscopic proctectomy	: Masafumi Inomata, MD
9:15 - 9:30	Laparoscopic LAR Thailand	: Charnjiroj Thiptanakit, MD
9:30 - 9:45	Laparoscopic LAR Japan	: Takahiro Hiratsuka, MD
9:45 - 10:00	Laparoscopic radical operation (pelvic exenteration, sacrectomy)	: Chucheep Sahakitrungruang, MD
10:00 - 10:30	Coffee Break	

Session 2: Laparoscopic Colectomy Soft Cadaver Hands on (8 stations)

10:30 - 10:40	Lap Talk	: Supakij Khomvilai, MD
10:40 - 10:50	Dressing	
10:50 - 12:00	Hands on	: All Speakers
12:00 - 13:00	Lunch	
13:00 - 15:30	Hands on	: All Speakers
15:30 - 16:00	Certificaton & Closing Remarks	: All Speakers

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Appendix 3

Schedule: 3rd Japan-Thailand Collaboration Program for Advanced Endoscopic Surgery Training Course

Jan.25(Mon.)					Jan.26 (Tue.)					Jan.27 (Wed.)					Jan.28 (Thu.)		Jan.29 (Fri.)	
Start	**Finish**	**Contents**	**Place**	**Dr.**	**Start**	**Finish**	**Contents**	**Place**	**Dr.**	**Start**	**Finish**	**Contents**	**Place**	**Dr.**		**Contents**		**Contents**
8:20		**Arrival**	Room 3													Hands-on training（Medical Training & Education Center, OLYMPUS CORPORATION）		Observation of OLYMPUS CORPORATION
8:30	**8:50**	Opening Remarks Prof. Ohashi (Director) Prof. Moriyama (Dean) Mr. Takizawa (JICA) Trainee	Room 3	Inomata														
8:50	**9:00**	Training Coures/Orientation	Room 3	Etoh	**8:45**	**8:50**	President's Welcome Address	Room 3	Kitano	**8:55**	**9:00**	Orientation	Room 3	Etoh				
9:00	**9:30**	Visit Hospital (Endoscopy Room/Inpatients' Ward)		Iwashita	**8:50**	**9:20**	Lecture5 Device of Laparoscopic Surgery	Room 3	Tojigamori	**9:00**	**9:30**	Lecture10 Endoscopic Therapy	Room 3	Ueda				
9:30	**13:00**	Observation of operation ・Lap-Sigmoid colectomy ・Lap-hepatectomy	Operation Room	Endo	**9:20**	**13:00**	Obeservation of operation ・LADG ・Lap-sleeve Gastrectomy	Operation Room	Uchida	**9:30**	**10:30**	SOLINE、Observation of Endoscopy	Surgical Labo Centre/Endoscopy room	Endo				
13:00	**14:00**	Lunch	Yamanami		**13:00**	**14:00**	Lunch	Yamanami		**10:30**	**10:35**	Closing Remarks	Room 3	Inomata				
14:00	**14:30**	Lecture1 Esophageal Cancer	Room 3	Shibata	**14:00**	**14:30**	Lecture6 Liver	Room 3	Iwashita			Transport Oita→Hachioji,Tokyo						
14:30	**15:00**	Lecture2 Gastric Cancer	Room 3	Etoh	**14:30**	**15:00**	Lecture7 Pancreas	Room 3	Yada									
15:00	**15:20**	Break			**15:00**	**15:20**	Break											
15:20	**15:50**	Lecture3 Colon Cancer（right）	Room 3	Tajima	**15:20**	**15:50**	Lecture 8 JSES Certification System	Room 3	Shiroshita									
15:50	**16:20**	Lecture4 Colon Cancer (left)	Room 3	Nakajima	**15:50**	**16:20**	Lecture 9 Bariatric/Metabolic Surgery	Room 3	Ohta									

Appendix 4

The 4th Japan-Thailand Collaboration Program

for Advanced Endoscopic Surgery Training Course

14th - 15th June 2016

Venue : Siriraj Training and Education Center for Clinical Skills (SiTEC), Siriraj Hospital

OITA UNIVERSITY

JICA

DAY 1 : 14th June 2016

09.00-09.05	Opening Remarks	Vitoon Chinswangwatanakul, MD
09.05-09.10	Welcome speech from the faculty	Prof.Masafumi Inomata, MD Clinical Prof. Emeritus Darin Lohsiriwat,MD
09:10-09:15	Welcome speech from JICA	Mrs. Chieko Kajisawa
Session 1: Basic & Principle of Laparoscopic Colorectal Surgery		Moderator : Prof.Masafumi Inomata, MD Prof.Thawatchai Akaraviputh, MD
09.15-09.30	Trocar Placement and Instrumentation for Laparoscopic Colorectal Surgery	Yuichi Endo, MD
09.30-09.45	Anatomy for Laparoscopic Colorectal Surgery	Kentaro Nakajima, MD
09.45-10.00	Safe use surgical Energy in area of colorectal surgery	Siriluck Prapasrivorakul, MD
10.00-10.15	Surgical Tissue Management System: THUNDERBEAT	Chadaporn Suksawad, Product Executive
10.15-10.45	Coffee Break	
Session 2: Technique for Colorectal Surgery		Moderator: Yuichi Endo, MD Prof.Thawatchai Akaraviputh, MD
10.45-11.00	Laparoscopic Right Hemi Colectomy	Masaaki Tajima, MD
11.00-11.15	Preoperative staging of rectal tumors	Assist.Prof.Atthaporn Trakarnsanga, MD
11.15-11.30	Laparoscopic LAR	Tomonori Akagi, MD
11.30-11.45	Trans Anal Rectal Cancer Surgery	Woramin Riansuwan, MD
11.45-13.00	Lunch	
Session 3: Latest findings for Colorectal Surgery & Hands on		Moderator : Kentaro Nakajima, MD Assist. Prof. Atthaporn Trakarnsanga, MD
13.00-13.15	State of Art " New Evolution of OR"	Hassanai Chakkarasutra, SI Executive
13.15-13.30	Quality initiatives in colorectal surgery : ERAS	Assoc.Prof. Varut Lohsiriwat, MD
13.30-13.45	Robotics assisted laparoscopic rectal surgery	Vitoon Chinswangwatanakul, MD
13.45-14.00	Diagnostic and Therapeutic Colonoscopy	Supakij Khomvilai, MD
14.00-17.00	Hands-on in training box Video Cases Discussion	Delegates Group 1 Delegates Group 2
Theme: "How did I do it? Managing complications and avoiding them." "How to avoid iatrogenic trauma in colorectal surgery"		Moderator: Tomonori Akagi, MD Chainarong Phalanusitthepha, MD Chotirot Angkurawaranon, MD

DAY 2 : 15th June 2016

Session 1: Skills & Certification system in Laparoscopic surgery		Moderator : Masaaki Tajima, MD Voraboot Taweerutchana, MD
09.00-09.30	JSES Certification system Current Status of Laparoscopic Colorectal Surgery in Japan	Prof.Masafumi Inomata, MD
09.30-09.45	Complications of colorectal stenting as a bridge to surgery for obstructive colorectal cancer	Prof.Thawatchai Akaraviputh, MD
09.45-10.00	Roles of Laparoscopic surgery Colorectal Cancer	Assoc. Prof. Asada Metasate, MD
Session 2: Laparoscopic Colectomy Soft Cadaver Hands on (8 stations)		
10.00-10.05	Lab Talk	Thammawat Parakonthun, MD Voraboot Taweerutchana, MD
10.05-10.20	Coffee Break & Dressing	
10.20-12.00	Hands on	
12.00-13.00	Lunch	
13.00-15.30	Hands on	All Speakers
15.30-15.40	Dressing	
15.40-16.00	Certification & Closing Remark Leave SiTEC	

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Appendix 5

5th JTCP Training Course

21 - 22 March 2017

Faculty : Oita University / Siriraj Hospital and Thai Faculty

DAY 1 : 21 March 2017

TIME		
8:30 - 8:35	Opening Remarks	Clin. Prof. Pansak Laksanabunsong, MD
8:35 - 8:45	Welcome speech from the faculty	Masafumi Inomata, MD
	Guest speech from JICA Thailand Office	Mr Koinuma/Ms Kajisawa
Session 1: Basic & Innovative in Laparoscopic Colorectal Surgery		
Moderator : Siriluck Prapasrivorakul, MD / Masafumi Inomata, MD		
8:45 - 9:05	Anatomy for Laparoscopic Colorectal Surgery	Tomonori Akagi, MD
9:05 - 9:20	Instrumentations for Laparoscopic Colorectal Surgery	Hajime Fujishima, MD
9:20 - 9:30	Tips and Tricks in controlling Flexible scope	Olympus Thailand
9:30 - 9:40	Product Presentation: New Technology of MIS: 4K	Olympus Thailand
9:40 - 10:00	Coffee Break	
Session 2: Laparoscopic Right Hemicolectomy		
Moderator: Woramin Riansuwan, MD / Tomonori Akagi, MD		
10:00 - 11:00	Basic Technique in Laparoscopic Right Hemicolectomy	Panel:
	- Positioning & ports placement & exposure	Siriluck Prapasrivorakul, MD
	- medial to lateral mobilization	Prapon Kanjanasilp, MD
	- lateral to medial mobilization	Pawit Sutharat, MD
	- Inferior to superior mobilization	
	- ICA & ICV approach: tips and tricks	
	- MCA & MCV approach: tips and tricks	
11:00 - 11:15	Laparoscopic Right Hemicolectomy: How I do it?	Yuichi Endo, MD
11:15 - 12:00	Lunch	
Session 3: Laparoscopic Left hemicolectomy & Sigmoidectomy		
Moderator : Pawit Sutharat, MD / Hajime Fujishima, MD		
12:00 - 13:00	Basic Technique	Panel:
	- Positioning & ports placement & exposure	Siriluck Prapasrivorakul, MD
	- medial to lateral mobilization	Prapon Kanjanasilp, MD
	- lateral to medial mobilization	Siripong Chewatanakornkul, MD
	- IMA approach: tips and tricks	
	- IMV approach: tips and tricks	
	- Splenic flexure mobilization and taken down	
	- Mesorectal amputation in sigmoidectomy and high anterier resection	
Session 4: Laparoscopic TME		
Moderator : Woramin Riansuwan, MD / Yuichi Endo, MD		
13:00 - 14:00	Basic Technique	Panel:
	- Rectal mobilization in TME with ANP	Atthaphorn Trakransga, MD
	- Transection of rectum with Endostaple	Pawit Sutharat, MD
	- Anastomosis with circular staple	Siripong Chewatanakornkul, MD
14:00 - 14:15	Laparoscopic TME: How I do it?	Kentaro Nakajima, MD
14:15 - 14:30	Transanal TME	Tomonori Akagi, MD
14:30 - 14:45	Coffee Break	
Session 5: Video case disscussion & Hands-on (Dry-lab)		
Moderator: Kentaro Nakajima, MD / Commentator: Masafumi Inomata, MD		
14:45 - 16:00	Video Case Discussion	Panel: All staff
	Hands-on : Dry Lab	

DAY 2: 22 March 2017

TIME		
Session 1: Skills & Ceritification system in Lap surgery		
Moderator : Yuichi Endo, MD		
9:00 - 9:20	Current Status of Laparoscopic Colorectal Surgery in Japan	Masafumi Inomata, MD
	- Education and Certification System	
Session 2: Laparoscopic Colectomy Soft Cadaver Hands on (8 stations)		
9:20 - 9:30	Lab Talk	Woramin Riansuwan, MD
9:30 - 9:45	Coffee Break & Dressing	
9:45 - 12:00	Hands on	
	- Laparoscopic Right Hemicolectomy	
12:00 - 13:00	Lunch	
13:00 - 15:30	Hands on	
	- Laparoscopic Left hemicolectomy & Sigmoidectomy	
	- Laparoscopic TME	
15:30 - 15:40	Dressing	
15:40 - 16:00	Certification & Closing Remark	

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Appendix 6

You are cordially invited to attend **SPECIAL MEETING**

6th JTCP Training Course

DAY 1: Tuesday 30th May 2017

08:40-08:45 **Welcome Address**
Assoc.Prof. Chanchai Sittipunt ,MD
Associate Dean for Planning and Development

08:45-08:55 **Opening Remarks**
Prof.Masafumi Inomata, MD
Jirawat Pattana-Arun, MD

08:55-09:00 **Guest Speech**
From JICA Thailand Office

Session 1: Basic Knowledge for Therapeutic Colonoscopy and Laparoscopic Colorectal Surgery

Moderator : Prof.Masafumi Inomata, MD
Jirawat Pattana-Arun, MD

09:00-09:20 **Colonoscopy Suit Set-up**
Supakij Khomvilai, MD

09:20-09:40 **Benefit of Colonic Stenting**
Sukit Pattarajierapan, MD

09:40-10:00 **Higest Standard in Therapeutic Colonoscopy**
Supakij Khomvilai, MD

10:00-10.20 **Surgical Pathology for Colorectal Cancer**
Tomohisa Uchida, MD

10:20-10:30 **New Technology: OR Integration Systems "EndoAlpha"**
Hassanai Chakkarasutra, *Olympus Thailand*

10:30-10:50 **Coffee Break**

10:50-11:10 **Good Camera Person**
Thitithep Limvorapitak, MD

11:10-11:30 **Vascular Anatomy for Laparoscopic Colorectal**
Hiroomi Takayama, MD

11:30-11:50 **Laparoscopic Hartmann Reversal**
Prapon Kanjanasilp, MD

11:50-12:00 **How to Use Flexible Scope**
Punyisa Yolbenjapol, *Olympus Thailand*

12:00-13:00 **Lunch**

Session 2: Video Clinic for Future Instructors

Moderator : Tejiro Hirashita, MD

13:00-14:30 **Video Lecture - Knowledge and Experience From Japan**
Right Hemicolectomy Yohei Kono, MD
Low Anterior Resection Tomonori Akagi, MD

14:30-14:45 **Coffee Break**

14:45-16:15 **Video Presentation - From Thailand**
Irin Chowchankit, MD
Thitithep Limvorapitak, MD
Ajjana Techagumpuch, MD
Ekarin Supratrakul, MD
Teeranut Boonpipattanapong, MD
Advisor: Oita University Faculty

16:15-16:30 **Advice From Oita Univ Faculty to the trainees**
Oita University Faculty

18:00-20:00 **JTCP Reception**

DAY 2: Wednesday 31st May 2017

Session 1: Education and Training System in Japan & Thailand

Moderator : Tomonori Akagi, MD
Vitoon Chinswangwatanakul, MD

09:00-09:15 **MIS & Colorectal Fellowship Program**
Prof.Chucheep Sahakitrungruang, MD

09:15-09:30 **MIS & Colorectal Fellowship Program**
Vitoon Chinswangwatanakul, MD

09:30-10:00 **JSES Certification System & Education/ Training System in Japan**
Prof.Masafumi Inomata, MD

Session 2: Cadaver Hands-on for Future Instructors

10:00-10:15 **Briefing on the Program**
Prof.Masafumi Inomata, MD

10:15-10:30 **Dressing**

10:30-12:00 **Cadaver Hands-on**

12:00-12:45 **Lunch**

12:45-14:15 **Cadaver Hands-on**

14:15-14:30 **Dressing**

14:30-15:00 **Feedback From Faculty**

15:00-16:00 **JTCP Closing Ceremony**

30th May 2017

1st Floor at Library Building of Faculty of Medicine

31st May 2017

Chula Soft Cadaver Surgical Training Center,
4th Floor of Pattayapat building,
King Chulalongkorn Memorial Hospital

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Appendix 7 Participant List (All Participants in Six Training Sessions)

[Thai Site Training]

Thai Site Training Session #1

No.	Name	Affiliation
1	Max Shawchia Jitraphongsathorn	Veterans General Hospital
2	Umaad Aegem	Yala Hospital
3	Wipa Pothito	Lopburi Hospital
4	Thanasan Pratumrat	Rajavithi Hospital
5	Supamit Leemasawat	Rajavithi Hospital
6	Naren Santigulanont	Police General Hospital
7	Jirat Jiratham-opas	Hatyai Hospital
8	Bunthit Sagoolngam	Phaholpolpayuhasena hospital
9	Nuttapoom Sermsri	Rajavithi Hospital
10	Ratchamon Pinyoteppratarn	Rajavithi Hospital
11	Teeranut Boonpipattanapong	Songklanagarind Hospital
12	Pawan Chansaenroj	Somdej Prapinklao Hospital
13	Pakapon Tudsri	Phramongkutklao Hospital
14	Ekkarin Supatrakul	Maharaj Nakorn Chiang Mai Hospital
15	Tawatchai Jirawasupornchai	Maharaj Nakorn Chiang Mai Hospital
16	Chainarong Kaveeyanond	Siriraj Hospital
17	Chananya Horkieti	Siriraj Hospital
18	Patra Thasee	Bhumibol Adulyadej Hospital
19	Prompirun Wattanawiggid	Bhumibol Adulyadej Hospital
20	Pakpoom Tirrawattanakul	Bhumibol Adulyadej Hospital

Thai Site Training Session #2

No.	Name	Affiliation
1	Bunthit Sagoolngam	Phaholpolpayuhasena hospital
2	Pawan Chansaenroj	Somdej Prapinklao Hospital
3	Teeranut Boonpipattanapong	Songklanagarind Hospital
4	Kriangkrai Munkong	Maharaj Nakhon Si Thammarat Hospital
5	Eakarach Lewthanamongkol	King Chulalongkorn Memorial Hospital
6	Ajjana Techagumpuch	King Chulalongkorn Memorial Hospital
7	Irin Chowchankit	King Chulalongkorn Memorial Hospital
8	Thititep Limvorapitak	King Chulalongkorn Memorial Hospital
9	Krittin Kajohnwongsatit	King Chulalongkorn Memorial Hospital
10	Ekkawit Lamthongin	Chomthong Hospital
11	Worawit Kattipatanapong	Chomthong Hospital
12	Umaporn Seehawong	Buriram Hospital
13	Nitikun Booning	Buriram Hospital
14	Wipa Pothito	Lopburi Hospital
15	Jirat Jiratham-opas	Hatyai Hospital
16	Nopdanai Chaisomboon	Bhumibol Adulyadej Hospital
17	Ekkarin Supatrakul	Maharaj Nakorn Chiang Mai Hospital
18	Worakitti Lapisatepun	Maharaj Nakorn Chiang Mai Hospital
19	Nuttapoom Sermsri	Rajavithi Hospital
20	Ratchamon Pinyotepprataarn	Rajavithi Hospital
21	Prawit Tantiwattanasirikul	Priest Hospital
22	Kongpon Tangpanitandee	Taksin Hospital
23	Mati Rattanasakalwong	King Chulalongkorn Memorial Hospital
24	Kittikarn Thongsonkleab	Songklanagarind Hospital
25	Natthawut Phothong	Panyananthaphikkhu Chonprathan Medical Center

Thai Site Training Session #3

No.	Name	Affiliation
1	Sarawuth Lomsri	Udonthani Hospital
2	Pramoth Kotpunkul	Udonthani Hospital
3	Chaloemphon Boonmee	Thabo Crown Prince Hospital
4	Arkom Suesawatee	Nongkhai Hospital
5	Pinyaphan Putkham	Nongkhai Hospital
6	Teeranut Boonpipattanapong	Songklanagarind Hospital
7	Ekkawit Lamthongin	Chomthong Hospital
8	Kriangkrai Munkong	Maharaj Nakhon Si Thammarat Hospital
9	Punlawich Phuphakdee	Kamphaeng Phet Hospital
10	Isariya Jongekkasit	Chaophrayayommarat Hospital
11	Wipa Pothito	Lopburi Hospital
12	Mati Rattanasakalwong	King Chulalongkorn Memorial Hospital
13	Ratchamon Pinyoteppratarn	Rajavithi Hospital
14	Pakapon Tudsri	Siriraj Hospital
15	Sumet Bunyajetpong	Siriraj Hospital
16	Benjaporn Nuntasunti	Siriraj Hospital
17	Anuchit Lerstsirithong	Siriraj Hospital
18	Bunthit Sagoolngam	Paholpolpayuhasena Hospital
19	Setthasiri Pantanakul	Samutprakan Hospital
20	Komol Chaivanijchaya	Suratthani Hospital

Thai Site Training Session #4

No.	Name	Affiliation
1	Natthawut Phothong	Panyananthaphikkhu Chonprathan Medical Center
2	Vittawat Ohmpornnuwat	Panyananthaphikkhu Chonprathan Medical Center
3	Warit Utanwutipong	Chaophya Hospital
4	Daryth Suwannarat	Songklanagarind Hospital
5	Papot Charutragulchai	Rajavithi Hospital
6	Teeranut Boonpipattanapong	Songklanagarind Hospital
7	Thanadeth Vongjarukorn	Police General Hospital
8	Piya Totemchokchokchyakarn	Vejthani Hospital
9	Phaiboon Pensuwan	Roi Et Hospital
10	Suwit Suwannawong	Sakon Nakhon Hospital
11	Yongsuda Chatsrisuwan	Maharaj Nakorn Chiang Mai Hospital
12	Poon Apichartpiyakul	Maharaj Nakorn Chiang Mai Hospital
13	Ekkarin Supatrakul	Maharaj Nakorn Chiang Mai Hospital
14	Sarawut Anuntasethakul	Kasemraj Prachachuen Hospital
15	Boualaphanh Bouakeosavanh	Siriraj Hospital
16	Phonexay Homthavong	Siriraj Hospital
17	Romyen Jitmung-ngan	Siriraj Hospital
18	Worawit Kattipatanapong	King Chulalongkorn Memorial Hospital
19	Pakkavuth Chanswangphuvana	Thammasat University Hospital
20	Kitikorn Cholvisudhi	Bangkok Phrapradaeng Hospital
21	Warut Boonnithi	Siriraj Hospital
22	Tanyanan Jamikorn	Police General Hospital

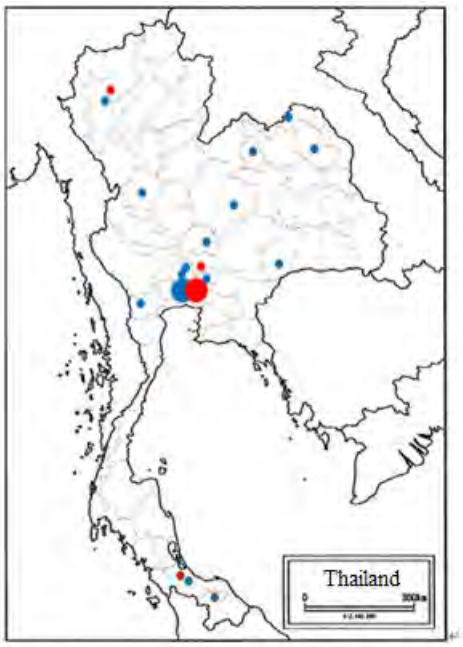
Thai Site Training Session #5

No.	Name	Affiliation
1	Ajjana Techagumpuch	Thammasat University Hospital
2	Chinavon Chiravatanond	Samitivej Chonburi Hospital
3	Chotirot Angkurawaranon	Rajavithi Hospital
4	Ekkarin Supatrakul	Maharaj Nakorn Chiang Mai Hospital
5	Pakkavuth Chanswangphuvana	Thammasat University Hospital
6	Teeranut Boonpipattanapong	Songklanagarind Hospital
7	Daryth Suwannarat	Songkhla Hospital
8	Irin Chowchankit	King Chulalongkorn Memorial Hospital
9	Jitpanu Wongyongsil	National Cancer Institute
10	Kriangkrai Munkong	King Chulalongkorn Memorial Hospital
11	Krittin Kajohnwongsatit	King Chulalongkorn Memorial Hospital
12	Kritskorn Srikiratiwong	King Chulalongkorn Memorial Hospital
13	Khwannara Ketwong	Police General Hospital
14	Nitikun Booning	King Chulalongkorn Memorial Hospital
15	Pinyaphan Putkham	Hatyai Hospital
16	Ratchamon Pinyotepprataarn	Rajavithi Hospital
17	Sukit Pattarajierapan	King Chulalongkorn Memorial Hospital
18	Thanadeth Vongjarukorn	Police General Hospital
19	Thititep Limvorapitak	King Chulalongkorn Memorial Hospital
20	Worawit Kattipatanapong	King Chulalongkorn Memorial Hospital

[Japanese Site Training]

No.	Name	Affiliation
1	Anuchit Lerstsirithong	Siriraj Hospital
2	Eakarach Lewthanamongkol	King Chulalongkorn Memorial Hospital
3	Jirat Jiratham-opas	Hatyai Hospital
4	KriangKrai Munkong	Maharaj Nakhon Si Thammarat Hospital
5	Nuttapoom Sermsri	Rajavithi Hospital
6	Pakapon Tudsri	Siriraj Hospital
7	Pawan Chansaenroj	Somdej Prapinklao Hospital
8	Teeranut Boonpipattanapong	Songklanagarind Hospital
9	Thun Ingkakul	Phramongkutklao Hospital
10	Umaad Aegem	Yala Hospital
11	Vittawat Ohmpornnuwat	Panyananthaphikkhu Chonprathan Medical Center
12	Wipa Pothito	Lopburi Hospital

[Distribution of Participants' Affiliated Hospitals]



Red: Teaching Hospital
Blue: Non-teaching Hospital