

KINGDOM OF THAILAND
RAJAVITHI HOSPITAL
SIRIRAJ MEDICAL SCHOOL, MAHIDOL UNIVERSITY

**COLLABORATION PROGRAM
WITH THE PRIVATE SECTOR
FOR DISSEMINATING JAPANESE
TECHNOLOGY
FOR DIALYSIS SYSTEM WITH CDDS**

**FINAL REPORT
SUMMARY**

MARCH 2015

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

**ASAHI KASEI CORPORATION
ASAHI KASEI MEDICAL CO., LTD.
NIKKISO CO., LTD.**

| |
|----------|
| OS |
| JR |
| 15 - 021 |

KINGDOM OF THAILAND
RAJAVITHI HOSPITAL
SIRIRAJ MEDICAL SCHOOL, MAHIDOL UNIVERSITY

**COLLABORATION PROGRAM
WITH THE PRIVATE SECTOR
FOR DISSEMINATING JAPANESE
TECHNOLOGY
FOR DIALYSIS SYSTEM WITH CDDS**

**FINAL REPORT
SUMMARY**

MARCH 2015

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

**ASAHI KASEI CORPORATION
ASAHI KASEI MEDICAL CO., LTD.
NIKKISO CO., LTD.**

Contents

| | |
|--|----|
| 1. Background and overview of the program..... | 1 |
| 2. Description of the current situation and development needs in the health sector in Thailand.. | 3 |
| 3. The contents and outcome of the program..... | 4 |
| 4. Direction for future business (development of business model and plan)..... | 9 |
| 5. Health development effects to be achieved through the promotion of future business..... | 10 |
| 6. Possibility for cooperation with future ODA projects..... | 12 |

1. Background and overview of the program

There were reported to be more than 40,000 hemodialysis (HD) patients in the Kingdom of Thailand as of 2012¹. In light of rapid progress in the advancement of the aging society, the government of Thailand began implementing a Universal Coverage Scheme (UCS) in 2002 along with a registration system for dialysis patients. On the other hand, quality dialysis centers are currently insufficient, and a safe, efficient, and cost-effective dialysis technique urgently needs to be disseminated.

Compared with the Individual Dialysis System (IDS) used in western countries, the Japanese dialysis system with the Central Dialysis Fluid Delivery System (CDDS) requires a higher level of skill. However, it has also been scientifically proven that the Japanese dialysis system with the CDDS has many advantages in terms of cost-effectiveness, labor-saving, and safety assurance thanks to its ability to prepare the dialysis fluid at a single centralized point and to provide it to each patient individually. Specifically, the Dialysis Outcomes and Practice Patterns Study (DOPPS) revealed that the mortality risk of Japanese HD patients was the lowest and that their life prognosis was the longest. The Japanese dialysis system also has fewer side effects. As a result, it has been demonstrated that Japanese HD patients have a high quality of life (QOL).

Under these circumstances, the Japanese dialysis system with the CDDS is expected to be disseminated to the emerging countries. Among these countries, Thailand provides medical care of high quality relative to its neighbors in the region of the Association of Southeast Asian Nations (ASEAN) and has the financial and technical means necessary to implement the Japanese dialysis system. In addition, the expansion of the system in Thailand will facilitate the further dissemination to the neighboring countries because Thailand has been promoting medical tourism as a national policy.

Based on the above background, this program aims to improve the standard of dialysis treatment by reducing the financial burden for both Thailand and patients in Thailand using the Japanese HD system, and to help address the development needs in the health sector in Thailand.

The CDDS, a product of Nikkiso Co., Ltd., consists of a water treatment system, a powder dialysate mixing unit, a central dialysate proportioning unit, a series of bedside consoles, and a fluid distribution piping system, all connected together. As one of the products related to the CDDS, Asahi Kasei Group has been producing a “high flux dialyzer” loaded into the dialysis

¹ Thailand Renal Replacement Therapy Year 2012

machine for filtering the patient’s blood. Nikkiso Co. and Asahi Kasei Group are among more than one hundred companies involved in producing dialysis machines and parts, including many small and medium enterprises. Thus, for demonstration activities to disseminate the Japanese dialysis system with CDDS overseas, Asahi Kasei Corporation, Asahi Kasei Medical Co., Ltd., and Nikkiso Co., Ltd. formed a consortium and implemented this program with the cooperation of the Eastern Kyushu Medical Valley Framework (EKMV). Following is an overview of the program.

| | | |
|---|---|-------------------------------|
| 1. Purpose of the Collaboration Program | <p>(1) To obtain an understanding of differences between the current system popularly used in Thailand and the Japanese dialysis system with CDDS in a training program provided by university professors and university hospitals in both Oita and Miyazaki Prefectures, eastern Kyushu.</p> <p>(2) To discuss practical strategies for implementing the Japanese dialysis system with the CDDS through a field study approach (based on the training program).</p> <p>(3) To develop and enhance the partnership between Thailand and Japan.</p> <p>(4) To facilitate a new growth strategy for medical technologies and services among ASEAN through leadership from Thailand.</p> | |
| 2. Duration | <p>From May, 2014 to March, 2015</p> <ul style="list-style-type: none"> • Training program in Japan: June 23 - July 4, 2014 • Detailed survey and demonstration activities in Thailand <ul style="list-style-type: none"> - First survey: July 27 - August 8, 2014 - Second survey: September 8 - 17, 2014 - Third survey: January 12 - 24, 2015 | |
| 3. Counterpart in Thailand | The Ministry of Health (MOH) and medical professionals such as doctors and nurses from Rajavithi Hospital and Siriraj Medical School, Mahidol University. | |
| 4. Japanese Members of the Program: | | |
| Name | In charge | Affiliation |
| Mr. Junichi Shirokaze | Team Leader | Asahi Kasei Corporation |
| Mr. Kazuo Kobayashi | Development Issue | Asahi Kasei Medical Co., Ltd. |
| Mr. Koki Obara | Dialysis Device, Interpreter for the Training Program in Japan | Asahi Kasei Medical Co., Ltd. |

| Ms. Miho Usui | Economical Evaluation | Asahi Kasei Corporation |
|---------------------------------------|--|---|
| Mr. Shigemitsu Ejiri | Dialysis Water Supply Equipment | Nikkiso Co., Ltd. |
| Mr. Nobuhiko Aida | Water Processing Technique | Nikkiso Co., Ltd. |
| Mr. Sota Nakagawa | Monitoring and Evaluation | Nikkiso Co., Ltd. |
| Mr. Goro Furumoto | Water Clarification with Microza | Asahi Kasei Chemicals Co., Ltd. |
| Dr. Tadashi Tomo | Dialysis Technology | Oita University |
| Prof. Shouichi Fujimoto | Nephrology-Dialysis | University of Miyazaki |
| Prof. Shingo Takesawa | Clinical Engineering | Kyushu University of Health and Welfare |
| Mr. Masahiro Okada | Public Private Partnership, Operational Coordination | CDC International Corporation |
| Ms. Kaori Kaise | Training Planning, Operational Coordination | CDC International Corporation |
| 5. Supporting Members of the Program: | | |
| Name | In charge | Affiliation |
| Ms. Sachiko Tomiyama | Supporting Prof. Fujimoto | Local Government of Miyazaki |
| Ms. Fumiyo Sato | Supporting Training Program in Japan | Local Government of Miyazaki |
| Mr. Yoshitsugu Akiyoshi | Supporting Dr. Tomo | Local Government of Oita |
| Mr. Takanori Hayashi | Supporting Training Program in Japan | Local Government of Oita |
| Mr. Tsunehisa Suita | Supporting Nikkiso Members | Nikkiso Co., Ltd. |
| Mr. Noriyuki Okabe | Supporting Prof. Takesawa | Medikit Co., Ltd. |

2. Description of the current situation and development needs in the health sector in Thailand

In May 2014, the National Council for Peace and Order (NCPO) was formed to stop the country's escalating political crisis and rule the country. Since then the NCPO has been exercising all powers and duties invested by law in the prime minister and cabinet, and it will continue to do so until the prime minister is formally elected. Politically, Thailand is now working toward the restoration of democracy within 2015 based on the NCPO's roadmap.

Thailand's real GDP growth rate as of 2012, when Thailand recovered from its severe floods, was 6.5% year-on-year. GDP growth then slowed to 2.9% in 2013 because of stagnant consumption, political instability, and so on.

As of 2012 the population in Thailand was about 67 million and declining (e.g., by 0.9% in 2011 and 0.5% in 2012). The proportion of youth decreased from 21% in 2010 to 18% in 2012, while the proportion of elderly over 60 years old increased from 13 % to 14%. Thus, Thailand has been steadily becoming an aging society.

The disease structure is also changing. Since 2005, chronic and degenerative diseases for the elderly have been principal diseases in Thailand. In addition, a high prevalence of non-communicable diseases (NCDs) such as diabetes and renal diseases caused by changing lifestyles due to rapid economic growth is also a serious issue in the health sector. The Ministry of Health clearly states that it prioritizes the prevention and control of NCDs in its health policy. Moreover, health policy prioritization is associated with the budget for the Universal Coverage Scheme (UCS) established in 2002. The National Health Security Office (NHSO) in charge of UCS secures budgets for disease treatment for specific diseases.

3. The contents and outcome of the program

(1) Training program in Japan

The trainees were the four women from Rajavithi Hospital and Siriraj Hospital named below. They stayed in Eastern Kyushu for 12 days, from Monday, June 23 to Friday, July 4, 2014. The purposes of the training were to grasp the current state of Japanese dialysis treatment and to acquire knowledge on the mechanism of "Purification of the dialysate solution."

Rajavithi Hospital

Dr. Wanniya Meenune (Nephrologist)

Ms. Pichitra Thoolmala (Dialysis nurse)

Siriraj Hospital

Dr. Kraiwiporn Kiattisunthorn (Nephrologist)

Ms. Supansa Wonganoo (Dialysis nurse)

The main training activities were as follows.

- * Courtesy visit to Miyazaki prefectural governor
- * Courtesy visit to Oita prefectural governor
- * Institutional tour at the kidney centre in Koga General Hospital
- * Institutional tour at the dialysis unit in Miyazaki Konan Hospital
- * Institutional tour at the dialysis unit in Morita Internal Medicine Clinic
- * Institutional tour at Matsuyama Clinic Oita Nephro Internal Medicine Department
- * Lectures at the Faculty of Medicine, University of Miyazaki Hospital
 - Countermeasures against infection
 - Countermeasures against disaster
 - Operations of a clinical engineer
- * Lectures at the Department of Medical Engineering, Kyushu University of Health and Welfare

Significant roles of the clinical engineer

Educational program for clinical engineers

* Lecture at the Faculty of Medicine, Oita University Hospital

Feature of hemodialysis treatment in Japan

Outline of the CDDS

ISO control criteria for Dialysis water as a global standard

Control criteria of the Japanese Society for Dialysis Therapy to prevent the bacterial contamination of dialysate solution

Quality control technique for water in the CDDS

Method for measuring the bacterial concentration of dialysate solution

Method for measuring the endotoxin concentration of dialysate solution

* Experimental Training for measuring the bacterial concentration and endotoxin concentration of dialysate solution at the Blood Purification Centre, Oita University Hospital

* Site visit to a water purification plant using Microza at the Life Spot facility in front of the Nobeoka branch office, Asahi Kasei Corporation.

* Final conference to report training results

(2) Detailed survey and demonstration activities in Thailand

1) Team to investigate water purity (bacteria test and endotoxin check)

Trainees were educated on the methods for using the bacterial test kit and endotoxin test kit in two hospitals using the same kits generally used at dialysis facilities in Japan.

Japanese and Thai members jointly decided the water sampling points and performed fixed point measurement of bacteria and endotoxin concentration in the water from each sampling point. Based on the test data, the sterilization method for the RO water pipe was improved.

2) Team for installation and maintenance of the tap water pre-treatment unit (Microza MF test machine)

The loads to the water-processing systems at dialysis units in Thailand to produce ultra-pure water from tap water are much bigger than the comparable loads sent to water-processing systems in Japan because tap water in Bangkok is unsuitable for drinking. So a small Microza MF, micro filter test machine with a long track record of use in water plants around the world (example: adopted at more than 300 water plants in North America, for a total water throughput of 2,500,000 tons/day), was installed at the dialysis unit in Rajavithi Hospital experimentally for about a half year. After the installation, a clear load reduction to the water-processing system in the dialysis unit was observed. The Microza MF also clearly reduced the concentration of very small particles and endotoxin with.

3) Team to investigate construction projects for new buildings and new dialysis units

Rajavithi Hospital and Siriraj Hospital are both engaged in construction projects for new buildings and are considering opening new dialysis units in the new buildings. Both hospitals considered introduction of a Japanese-style dialysis system based on the exchange of views on the floor plans suggested by the Japanese side, confirmation of the progress of construction, and information from the field survey. Rajavithi Hospital decided to introduce the CDDS for 10 beds at a new dialysis unit in its new building, which is to be opened in 2018. Siriraj Hospital is positively considering the introduction of the CDDS in its new building, which is to be opened in 2020. Further improvement of the water-processing systems running at existing dialysis units was also discussed specifically in the two hospitals.

4) Team to investigate actual condition of dialysis treatment (dialysis and medicine treatment)

One of the Thai nephrologists' worries regarding the CDDS introduction to Thailand became clear as a result of the training in Japan. Specifically, the nephrologist was concerned that the composition of dialysate solution would be fixed for each patient in the case of the CDDS. An investigation was therefore launched to determine the standards the Thai nephrologists use to change the dialysate compositions for every patient at each hospital, in order to clarify this very important point on the occasion of the future CDDS introduction to Thailand. The investigation determined that it would be no problem to introduce the CDDS for stable chronic maintenance patients. The two hospitals investigated are flagship in Thailand and manage a lot of dialysis patients with unstable clinical conditions. Both considered the introduction of the CDDS in view of its cost advantages for stable chronic maintenance patients and also considered the introduction of individual dialysis machines for unstable dialysis patients.

5) Team to investigate the possibility of introducing a clinical engineer system

As medical standard is improving in Thailand, resuscitators are now maintained by special respiratory equipment engineers in hospitals. Further, a society of cardiac surgeons developed an original authorization system for special engineers to secure extracorporeal circulation specialists in Thailand. But Thai hospitals lack engineers in the Thai dialysis field. Instead, engineers employed by dialysis machine enterprises are managing maintenance. Many nephrologists and dialysis nurses in Thai hospitals who have studied the quality management methods for dialysate solution practiced by clinical engineers in Japan understand the need for the introduction of clinical engineers into their dialysis units. They know that dialysis nurses should not be burdened with task of dialysate quality management.

A new clinical engineering department in Chulabhorn International College of Medicine, Thammasat University may be established within the new school term of August, 2015. There is

also a possibility that the set-up of the new department will take more time than expected because Thammasat is a National University. But the clinical engineering department will be established and education will start by no later than August, 2016. King Mongkut's University of Technology North Bangkok also showed strong interest in the medical field and would like to establish a clinical engineering department like Thammasat University.

6) Team to investigate medical financial of dialysis field

Kidney alternative therapy was expanded suddenly through political support in Thailand after the introduction of the Peritoneal Dialysis (PD) First Policy in 2008. Patients unable to receive medical treatment up to then were given the opportunity to receive treatment through this policy, which brought to light the potential needs of dialysis patients. But the period of PD treatment is generally limited from 2 years to 10 years in Thailand, due to peritoneal induration and infection. Eventually it becomes necessary to shift alternative kidney therapies. The policy authority also recognizes this limit and has indicated that the PD First Policy may be converted around 5 years from now on. There is a need to consider what kind of incentive is to be added to dialysis treatment in Thailand, where the infrastructure for dialysis is still insufficiently developed.

Scenarios where PD management spreads by leaps and bounds under the PD First Policy in a top down manner are helpful for thinking of the future of HD from the viewpoint of business. If the newly proposed policy of CDDS introduction shows prospects for reducing social security expenses, there is a possibility that the HD market will expand quickly under the policy.

7) Seminar at hospitals in Bangkok

A half day seminar was held locally for each of three occasions. The purposes of the seminar were to inform the highest level people in the hospital and the people in the dialysis unit about the purpose of the field survey, and to have them cooperate in the investigation.

a) The 1st local activity

A seminar was held separately at Rajavithi Hospital and at Siriraj Hospital under the following program before the field surveys by each team.

- Greeting from the Hospital Director
- Greeting from Mr. Iijima, JICA Thailand Office, and donation ceremony for the toxinometer
- Greeting from Prof. Fujimoto, representative of the Japanese field survey team

- Report on the Visiting Program in Japan by the training participants (Dr. Sakarn, Rajavithi Hospital and Dr. Kraiwiporn, Siriraj Hospital)
- Introduction of Japanese dialysis therapy (Dr. Tomo, Oita University)
- Introduction of the clinical engineer system in Japan (Prof. Takesawa, Kyushu University of Health and Welfare)
- Explanatory overview of the survey (Mr. Shirokaze, Asahi Kasei)
- Explanation of Microza MF as a pretreatment filter for tap water (Only at Rajavithi Hospital: Mr. Furumoto, Asahi Kasei Chemicals)

b) The 2nd local activity

A seminar was held separately at Rajavithi Hospital and at Siriraj Hospital under the following program before the field surveys by each team. The purposes of the seminar were to inform the highest level people in the hospital and the people in the dialysis unit about the results of the 1st local activity and the purpose of 2nd field survey.

- Greeting from the Hospital Director
- Greeting from Mr. Karaki, First Secretary, Japanese Embassy
- Report on the accomplishments of the 1st field survey (Mr. Aida, Nikkiso)
- Presentation on the clinical effect of ultra-pure water on dialysis patients (Dr. Tomo, Oita University)
- Interim report on test machine operation of Microza MF (Mr. Furumoto, Asahi Kasei Chemicals)
- Purpose of the 2nd visiting program (Mr. Shirokaze, Asahi Kasei)

c) The 3rd local activity

A combined seminar for both hospitals was held at Rajavithi Hospital because this was the final field survey. It was held by under following program as a general summary of three investigation activities conducted for about a half year.

- Greeting from Dr. Jiro, Ministry of Public Health
- Greeting from Dr. Kriengsak, Siriraj Hospital
- Greeting from Mr. Karaki, First Secretary, Japanese Embassy
- Collaboration between Thailand and Japan, achievements of water purification in Siriraj Medical School (Dr. Kraiwiporn, Siriraj Hospital)
- Achievements in Rajavithi Hospital, including improvement of water purification using Microza (Dr. Sakarn, Rajavithi Hospital)

- New era of dialysis therapy in Thailand (Dr. Tomo, Oita University)
- Guideline for drug therapy for ESRD patients in Japan (Prof. Fujimoto, University of Miyazaki)
- Collaboration with Japan concerning education for clinical engineers (Dr. Adis, Thammasat University)
- Possibilities for Clinical Engineers in ASEAN Countries (Prof. Takesawa, Kyushu Univ. of Health and Welfare)
- Greeting from Dr. Panthep, National Health Security Office
- Greeting from Mr. Kimura, JICA Thailand Office
- Closing Remarks from Dr. Prasert, Rajavithi Hospital

The importance of the cooperation between Thailand and Japan was accentuated in the greetings by Dr. Jirof from the Ministry of Public Health and Dr. Panthep (dialysis program chief) from the National Health Security Office, the body integrating the insurance system in Thailand. Big developments in the purification of dialysate solution over this half year at the dialysis units in Rajavithi Hospital and Siriraj Hospital were reported. Dr. Sakarn from Rajavithi Hospital introduced a powerful plan for the future in his presentation: "We decided to introduce the CDDS (10 beds at first) in our new dialysis unit. We will advance education for clinical engineers in collaboration with Thammasat University." Dr. Adis from Thammasat University reported on preparations for the educational program of clinical engineers. It was a meaningful seminar. Many detailed suggestions on the future direction for Thai dialysis treatment were offered from the Japanese side.

4. Direction for future business (development of business model and plan)

(1) Business implementation structure

Based on the future plans for new buildings and dialysis units at Rajavithi Hospital and Siriraj Hospital, respectively, estimates and floor plans were proposed and discussed. Furthermore, both hospitals continue to utilize their current dialysis units. Therefore, proposals and estimates to improve the water processing systems at the current dialysis units were offered as per their requests.

In order to implement the CDDS to the new dialysis units, Nikkiso, a company experienced with CDDS installation in Japan, will further discuss the detailed implementation plan with both hospitals in cooperation with Nikkiso Medical Thailand.

Both hospitals are also considering the installation of Microza MF to improve the water processing systems at their current dialysis units. Therefore, Asahi Kasei Chemicals will also estimate the further cost for installation of Microza MF in collaboration with the local engineering firm in Thailand.

As for related Japanese dialysis consumable goods such as endotoxin test kits, dialyzers, blood circuits, and indwelling needles, both makers will step up commercial distribution of their products in an effort to facilitate greater utilization of their products at both hospitals as educational institutions. Those products are therefore expected to be further disseminated in Thailand and to the ASEAN region as a whole through the visitors and trainees from those countries.

(2) Schedule for business development

The tentative schedule for future business development is described below.

- 2015~2016: Introduction of pre-treatment units for tap water such as Microza MF and ultra-pure water production units to the current dialysis units in Rajavithi Hospital and Siriraj Hospital, and training on maintenance techniques by the Japanese experts
- 2016~2017: Support for opening the clinical engineer course in Thammasat University and preparation for installation of the CDDS training facility at the university
- 2017~2018: Installation of the Nikkiso CDDS to the new dialysis unit in the newly established medical ward in Rajavithi Hospital
- 2019~2020: Installation of the Nikkiso CDDS to the new dialysis unit in the newly established medical ward in Siriraj Hospital

5. Health development effects to be achieved through the promotion of future business

(1) Dialysis patients as direct beneficiaries

The annual rate of increase in the patients receiving renal replacement therapy (RRT) is over 10% in Thailand. As of 2012, the total number of patients receiving the three treatments in RRT, namely, HD, PD, and kidney transplantation (KT), was 58,385. Among these patients, the number of HD patients was 40,505.

The MOH is currently implementing a PD First Policy. On the other hand, the treatment period for PD is limited to between 2 to 10 years. At some point during PD, the treatment needs to be shifted to other treatment methods such as HD in order to avoid infection. In fact, a certain

number of patients receive HD treatment by self-payment at the moment.

Furthermore, some officials of the MOH think that the current PD First Policy will be changed within five years. Therefore, the number of HD patients seems likely to steadily rise in association with the progress in health insurance reform.

(2) Health human resources to achieve the development effect in dialysis

In relation to the above situation, the number of dialysis centers in Thailand has been increasing, as well. As of 2012 the number of dialysis centers was 533, and it has been growing at a rate of over 10% per year since. Now, 35% of all the dialysis centers are concentrated in Bangkok and many HD patients are in the Bangkok metropolitan area. Meanwhile, the number of HD patients and dialysis centers and machines in local regions, especially in the northeastern part of the country, is rapidly rising every year.

As a result, human resources in healthcare such as nephrologists and dialysis nurses need to be developed urgently. As of 2009, the number of medical doctors was 35,800, of whom 85% were specialists. There are also 18 medical colleges in the whole of Thailand, and about 1,500 new medical doctors have been produced every year since 2005. Meanwhile, about 120,000 registered nurses have been working, and the number of new nurses produced by Thailand's 74 nursing colleges every year ranges from 4,000 to 5,000.

There is also a disparity between the ratio of medical doctors and nurses to patients in Bangkok and that in local regions. Specifically, Bangkok has one doctor per 565 people, while northeastern Thailand, the region with the fewest doctors, has only one doctor per 2,870 people. The rates for nurses are one nurse per 215 people in Bangkok and one nurse per 737 people in the northeast.

Correct information on the number of nephrologists and dialysis nurses in the whole of Thailand and problems in the allocation of health human resources at hospitals have not been fully analyzed at the moment. However, as stated above, the demand for these dialysis treatment professionals will increase as the number of dialysis patients continues to rise in the future.

(3) Scenario to accomplish the development effect in dialysis

This has been an ongoing program to contribute to the improvement of patient quality of life (QOL) through dialysis treatment as a health development effect. In order to sustain this effect into the future, firstly, nephrologists and dialysis nurses need to be trained for advanced dialysis

treatment with the Japanese dialysis system. Subsequently, dialysis patients, as direct beneficiaries, are expected to receive excellent dialysis treatment and further improved QOL.

6. Possibility for cooperation with future ODA projects

Based on the outcome of this program and the business schedule mentioned above, the following are proposed as possible future ODA collaboration projects.

| Time | Project Name | Contents | Possible ODA Scheme |
|--------------|---|--|--|
| 1-2 year (s) | Decision-Maker Training | Inviting and showing Japanese HD treatment to demonstrate its advantages to government officials and physicians. | Implemented by the JICA Seminar on Dialysis Technology in Japan in 2013, and this CDDS program |
| | Survey on improvement of dialysis water quality | Conducting a detailed survey on the problems and plans for improvement of dialysis water quality in Rajavithi hospital and Siriraj hospital, and conducting training on the preparation, supply, and management of dialysis water | Implemented by this CDDS program |
| | Program for disseminating the water purification and dialysis technique in the dialysis training center development plan | 1) Introduction of pre-treatment units for tap water (such as Microza MF), ultra-pure water production units, and related the Japanese dialysis goods to the current dialysis units in Rajavithi hospital and Siriraj hospital, and the establishment of an initial training center 2) Training program in eastern Kyushu, Japan and the above training center in Thailand targeting dialysis treatment professionals such as doctors and nurses in ASEAN | Collaboration Program with the Private Sector for Disseminating Japanese Technology with funds from the supplementary budget of FY 2014, targeted at health and medical projects |
| | Training program for engineers on dialysis technology and technical cooperation for the establishment of the clinical engineer course | 1) Support for opening the clinical engineer course in Thammasat University and preparation for the installation of the CDDS training facility at the university 2) Training program for engineers in eastern Kyushu, Japan and coaching by the Japanese experts in Thailand | JICA Partnership Program (Local Government Type) |
| 3-5 years | Training program for dialysis treatment professionals | 1) Introduction of the Japanese dialysis system, including the CDDS and related dialysis goods, to the newly established dialysis units in Rajavithi hospital and Siriraj hospital, and the establishment of a full-scale training center 2) Training program in the above training center in Thailand targeting dialysis treatment professionals such as doctors and nurses in ASEAN | Third Country Training Program |
| | Technical cooperation project for the introduction of the clinical engineers system | Formulation of a technical cooperation project at the request of MOH, and implementation of a technical cooperation project aimed at support for the introduction of the clinical engineers system in Thailand and the development of clinical engineers, etc. | Technical Cooperation Project or Collaboration Program with the Private Sector for Disseminating Japanese Technology |
| | Research Network for HD treatment | Research to develop a model to introduce Japanese HD treatment and to narrow global/regional gaps of HD treatment in the future, including measures to control the number of patients who resort to dialysis by disseminating treatments for primary diseases such as diabetes and glomerulonephritis. | Science and Technology Research Partnership for Sustainable Development (SATREPS) |

As stated above, the EKMV will try to formulate and implement the future incoming projects based on two policy agendas: “further strengthening Rajavithi hospital and Siriraj hospital and introducing the clinical engineers system to Thailand” and “disseminating the Japanese dialysis system to the ASEAN region.”

First of all, the next project is urgently to be formulated based on the ODA scheme, “Collaboration Program with the Private Sector for Disseminating Japanese Technology with funds from the supplementary budget of FY 2014, targeted at health and medical projects.” The specific activities are the introduction of pre-treatment units for tap water (such as Microza MF) to the current dialysis units in Rajavithi Hospital and Siriraj Hospital, and the training on maintenance techniques by the Japanese experts. The Japanese ultra-pure water production unit is also to be installed in collaboration with both hospitals, whereupon their current two dialysis units are scheduled to become the first training center for the Japanese dialysis system. This center will play a role as a “showcase” for Japanese dialysis goods such as individual dialysis systems, endotoxin test kits, dialyzers, blood circuits, and indwelling needles. Moreover, the training program at this center is regarded as a first step for disseminating the Japanese dialysis system to neighboring countries in ASEAN by targeting dialysis treatment professionals such as doctors and nurses in collaboration with Rajavithi Hospital and Siriraj Hospital.

As measures to further strengthen the functions of Rajavithi Hospital and Siriraj Hospital, the following activities are under consideration under the “JICA Partnership Program” ODA scheme.

- Support for opening the clinical engineer course now in progress in Thammasat University, and preparation for installation of the CDDS training facility at the university
- Training program for engineers in eastern Kyushu, Japan and coaching by the Japanese experts in Thailand