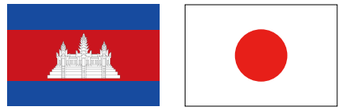
Dialysis, Renal Transplantation, Clinical Engineering, and Diet Therapy for Diabetes Mellitus and Chronic Kidney Disease

~ intensive seminar ~

March 29 ~ April 5, 2015

Phnom Penh, Cambodia

JAC-DSC



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Japanese Assistance Council of establishing
Dialysis Specialists system in Cambodia

International University, Phnom Penh, Cambodia

President of the Japanese Assistance Council of Establishing Dialysis Specialist System in Cambodia (JAC-DSC)

Hideki Kawanishi, M.D., Ph.D.

Director, Kidney Center and Surgery, Tsuchiya General Hospital, Hiroshima, Japan
Clinical Professor, Faculty of Medicine, Hiroshima University, Hiroshima, Japan
Vice President, International Society of Blood Purification (ISBP) / Congress President of ISBP 2016
President, Japanese Society for Hemodiafiltration / Council Member, Japanese Society for Peritoneal Dialysis
Council Member, Japanese Society for Dialysis Access / Council Member, Japanese Society for Blood Purification in Critical Care
Steeling committee of PDOPPS / NGO Ubiquitous Blood Purification International, Yokohama, Japan
Guest Professor, International University, Phnom Penh, Cambodia

Dear Participants:

The number of patients being treated for end-stage renal disease (ESRD) globally was estimated to be 3,200,000 at the end of 2013 and, with a 6% growth rate, continues to increase at a significantly higher rate than the world population. In particular, a remarkable increase in ESRD incidence has been observed in Asian countries. However, access to treatment is still limited in many developing countries, and a number of patients with terminal renal failure do not receive treatment. Improvements in dialysis systems and staff education are necessary to increase patient survival.

The Dialysis, Renal Transplantation, Clinical Engineering, and Diet Therapy for Diabetes Mellitus (DM) and Chronic Kidney Disease (CKD) education program provides a training and educational opportunity within the frame of the Cambodia Dialysis Medical Staff Engagement Support Association for students who are interested in chronic and end-stage kidney diseases. This education program is provided to Cambodian younger physician and medical staff who are interested in improving their scientific knowledge in CKD management and dialysis therapies. We would like to invite not only the junior medical staff but also all dialysis team in Cambodia to participate.

Vice President of the JAC-DSC

Toru Hyodo, M.D., Ph.D.

Director, Eijin Clinic, Hiratsuka, Japan / Invited Associate Professor, Department of Urology, Kitasato University, Sagamihara, Japan
Congress President of the Japanese Society for Hemodialfiltration 2011 / Council Member, Japanese Society for Dialysis Therapy (JSDT)
Council Member, Japanese Society for Hemodiafiltration / Council Member, Japanese Society for Peritoneal Dialysis
Council Member, Japanese Society for Dialysis Access / Council Member, Japanese Society for Renal Nutrition
Vice Chairperson of JSDT Committee to Support Young Doctors and Co-medical Staffs in Dialysis Fields in Developing Countries
Secretary General, NGO Ubiquitous Blood Purification International, Yokohama, Japan
Guest Professor, International University, Phnom Penh, Cambodia

Dear, Senior and Young Doctors in Cambodia, Medical Students, Nursing Students, and Pharmaceutical and Dental Students of International University:

NGO Ubiquitous Blood Purification International (UBPI) and IU established the Cambodia-Japan Friendship Blood Purification Center at Sen Sok International University Hospital (SSIUH) in 2010. Only 3 nurses and 4 doctors have received dialysis specialist training by NGO UBPI since its establishment. Among them, 2 nurses and 3 doctors are now treating or planning to treat hemodialysis patients at three different hospitals (SSIUH, IU Branch Hospital, and the other hospital) in Cambodia. These nurses and doctors are educating several nurses at their own hospitals. However, the number of patients with ESRD and CKD in Cambodia has increased significantly. Improvements in dialysis systems and staff education are necessary to increase the survival of these patients. Dialysis specialists will also be needed not only to provide patient treatment but also to educate hospital staff. Moreover, new dialysis machines are highly sophisticated. Thus, specialists capable of operating such complicated mechanical medical devices are needed. Such specialists, known as clinical engineers serve an important role in dialysis treatment.

ESRD and CKD patients require special diet therapies. For example, low-protein diet therapy is recommended for patients with CKD-associated nephritis. Diabetic CKD and ESRD patients require both low-protein and blood sugar-suppressing diet therapies. These diet therapies are very sophisticated and complicated and thus, require specialists experienced with their administration. In Cambodia, Myanmar, and Vietnam, specialists in dietetics are lacking. Universities in advanced countries, such as Japan and the United States, offer courses in nutrition to educate future dietitians.

The establishment of Faculty of Clinical Engineering and Faculty of Nutrition at SSIU is planned in the future.

The Dialysis, Renal Transplantation, Clinical Engineering, and Diet Therapy for DM and CKD education program is hosted by IU and the Japanese Assistance Council of Establishing Dialysis Specialist System in Cambodia (JAC-DSC). Many members of NGO UBPI attend the JAC-DSC.

Vice President of the JAC-DSC

Kenichi Kokubo, Ph.D.

Associate Professor, Kitasato University School of Allied Health Sciences, Sagamihara, Japan
Auditor Secretary, NGO Ubiquitous Blood Purification International, Yokohama, Japan
Guest Professor, International University, Phnom Penh, Cambodia

Dear Participants:

Various medical professionals, such as doctors, nurses, clinical engineers, dieticians, physical therapists, laboratory medical technologists, and pharmacologists, work in close coordination to support patients undergoing dialysis therapy. It is important that professional staff be knowledgeable not only in the medical aspects of dialysis therapy but also the engineering aspects. Engineering knowledge is required to determine operating conditions, dialysis modality, and dialyzer and for proper hemodialysis equipment maintenance. Such knowledge directly impacts the therapeutic efficacy of dialysis. We hope that, through this intensive course, participants will learn more about dialysis therapy and are encouraged to become dialysis therapy specialists.

Secretary General of the JAC-DSC

Haruki Wakai, M.D.

President, Reiseikai Medical Corporation, Tokyo, Japan
Director, Shinagawa Garden Clinic, Tokyo, Japan
Assistant Director, Gotanda Garden Clinic, Tokyo, Japan
Council Member and Secretary, Japanese Society for Home Hemodialysis
Auditor Secretary, Japanese Society for Renal Nutrition
Director and Vice Secretary General, NGO Ubiquitous Blood Purification International, Yokohama, Japan
Guest Professor, International University, Phnom Penh, Cambodia

Dear Participants:

We are very pleased to host this intensive program in cooperation with International University.

The number of patients with renal disease is increasing daily. Unfortunately, the number of patients with significant kidney function loss that require dialysis treatment or renal transplantation is also rapidly increasing and has become a global issue.

In Japan, approximately 300,000 patients have received dialysis to date. There are approximately 4000 dialysis institutions with approximately 130,000 artificial dialyzers in operation. Thus, one out of every 400 Japanese people is on artificial dialysis.

Similar to Japan, future economic development in Cambodia is expected to lead to an increase in the number of kidney disease patients requiring dialysis treatment and renal transplantation.

To handle this increased demand for dialysis treatment, medical professionals specializing in dialysis will be needed also in Cambodia. Therefore, there is an immediate need for dialysis education and training.

Many Japanese volunteer lecturers will participate in this program and present lectures on dialysis and renal transplantation-related topics based on their specialized expertise. This program is designed to provide Cambodian medical professionals and students with the opportunity to improve their scientific knowledge in CKD management and dialysis therapies through an easy to understand and practical lecture format. We look forward to your active participation and a lively discussion.

We sincerely hope that this lecture will further promote friendship between Cambodia and Japan and serve as the first step toward a productive cooperative relationship in the future.

Special Adviser of the JAC-DSC

Kazunari Yoshida, M.D., Ph.D.

Professor, Division of Organ Transplant and Regenerative Medicine, Department of Advanced Medicine, Research and Development Center for New Medical Frontiers, Kitasato University School of Medicine, Sagamihara, Japan
Head, Transplant Support Center, Kitasato University Hospital, Sagamihara, Japan
Director, NGO Ubiquitous Blood Purification International, Yokohama, Japan
Guest Professor, International University, Phnom Penh, Cambodia

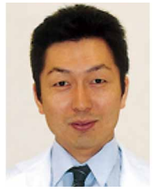
Special Adviser of the JAC-DSC

Nobuhisa Shibahara, MD., Ph.D.

Director, Arisawa General Hospital, 12-14 Higashino-cho, Nakamiya, Hirakata, Osaka 573-1195, Japan
<Key figure of my hospital>
- Beds for inpatients : 157
- Dialysis machines : 92
- Outpatients : About 400/day
- Dialysis patients : 240
- VA operation : About 400/year

Councilor, Japanese Society for Dialysis Therapy
Director, NGO Ubiquitous Blood Purification International, Yokohama, Japan
Guest Professor, International University, Cambodia

Fumitaka Nakajima, M.D.



Director, Kadoma Keijinkai Clinic, Osaka, Japan
Council Member, Japanese Society of Dialysis Therapy
Council Member, Japanese Society of Urology
Council Member, Japanese Society of Nephrology
Council Member, Japanese Society of Apheresis
Guest Professor, International University, Phnom Penh, Cambodia

Toshihide Naganuma, M.D., Ph.D.

Lecturer, Department of Urology, Osaka City University Graduate School of Medicine, ,Osaka, Japan
Congress Secretary General of the Japanese Society for Dialysis Therapy 2016
Guest Professor, International University, Phnom Penh, Cambodia

Tomotaka Naramura, C.E., Ph.D.

Assistant Professor, Faculty of Health Sciences, Department of Medical Engineering, Junshin Gakuen University, Fukuoka, Japan
Technical Adviser, Ide Clinic, Hyogo, Japan
Council Member, Japan Association for Clinical Engineers
Clinical Engineer
Certified Dialysis Technician
Guest Professor, International University, Phnom Penh, Cambodia

Satoko Tamura, R.D.

Registered Dietitian, Ohno Memorial Hospital, Osaka, Japan
Certified Diabetes Educator of Japan
Total Nutrition Therapy Dietitian
President, Japanese Society for Renal Nutrition

Yukie Kitajima, R.D., Ph.D.

Assistant Professor, Tokyo Healthcare University, Tokyo, Japan
Registered Dietitian

Miku Tanabe, R.N.

Registered Nurse, Reiseikai Medical Corporation, Tokyo, Japan

Takayuki Abe, C.E., M.S.

Clinical Engineer, Tokyo Women's Medical University Hospital, Tokyo, Japan
Certified Dialysis Technician
Master of Science in Social & Cultural Studies

Takatoshi Sakurasawa, C.E., B.S.

Clinical Engineer, JA Nagano Kouseiren Shinonoi General Hospital, Nagoya, Japan
Certified Dialysis Technician
Bachelor of Science in Clinical Engineering

Shunichiro Urabe, C.E., M.S.

Clinical Engineer, Eijin Clinic, Hiratsuka, Japan
Master of Science in Medical Sciences

Emi Kimura, C.E.

Chief Clinical Engineer, Reiseikai Medical Corporation, Tokyo, Japan
Certified Dialysis Technician

Ayumi Takizawa, C.E.

Clinical Engineer, Tokyo Women's Medical University Hospital, Tokyo, Japan
Certified Dialysis Technician

Natsumi Abe, C.E., M.T.

Deputy Chief Clinical Engineer, Reiseikai Medical Corporation, Tokyo, Japan
Medical Technologist

Yuki Tateno, P.T., B.A.

Chief Physical Therapist, Reiseikai Medical Corporation, Tokyo, Japan
Bachelor of Arts in Policy Management

Hirokazu Matsubara, B.E.

Vice Secretary General of the JAC-DSC
Managing Director, TUC (Tanaka Urology Clinic Group) Japan Dialysis Center, Osaka, Japan
Vice President, TUC Vietnam
Vice Secretary General, NGO Ubiquitous Blood Purification International, Yokohama, Japan
Bachelor of Engineering in Computer Science

Rika Yamanaka, B.A.

Assistant Secretary of the JAC-DSC
Director and Office Manager, Reiseikai Medical Corporation, Tokyo, Japan
Certified Financial Planner
Bachelor of Arts in English

Tomoko Watanabe, A.A.

Chief Medical Coding Specialist, Reiseikai Medical Corporation, Tokyo, Japan
Certified Sales Representative
Associate of Arts in English

Overview of kidney disease

Haruki Wakai, M.D.

The kidney is a vital organ that performs many important functions to support life. Decreased kidney function can lead to various symptoms such as reduced urinary volume, edema, anemia, loss of appetite, and general malaise, which gradually affect other organs.
In this lecture, I will cover the symptoms and pathology of renal diseases and provide an overview of representative renal diseases such as chronic glomerulonephritis, diabetic nephropathy, nephrosclerosis, chronic pyelonephritis, cystic renal disease, and nephrotic syndrome.

Care of patients with chronic kidney disease

Kazunari Yoshida, M.D., Ph.D.

Patients with reduced renal function, defined as a glomerular filtration rate of less than 60 ml/min and presence of proteinuria, are classified as having chronic kidney disease (CKD). Patients with CKD should be closely followed up and provided treatment as needed, because they are likely to suffer from end-stage kidney disease and cardiovascular and cerebrovascular disease, both of which are life-threatening conditions. Patients with CKD often have hypertension and metabolic disorders, such as high blood sugar, diabetes, hyperlipidemia, and hyperuricemia. Follow-up of CKD patients should include a physical examination including blood pressure and body weight and kidney function assessment including blood urea nitrogen, serum creatinine, and urinalysis. Special attention should also be paid to diet.
In this lecture, we will discuss the care and treatment of CKD patients to prevent disease progression. We will also discuss the routine tests for CKD patients, including urinalysis.

Historical development of dialysis therapy

Hideki Kawanishi, M.D., Ph.D.

Modern dialysis therapy started in the 1960s. Since then, several new developments in dialysis machines and systems have occurred and have made dialysis a life-saving treatment for patients with CKD.

Treatment selection for patients with renal failure

Haruki Wakai, M.D.

Renal replacement therapy is required for patients with severely reduced renal function. Renal replacement therapy includes hospital and home hemodialysis, peritoneal dialysis, and renal transplantation. Appropriate therapy selection should be based on disease pathology and clinical condition of the patient.
In this lecture, an overview and features of the therapeutic options for patients with renal failure will be provided. I will also discuss the steps necessary to provide treatment for Cambodian patients with renal failure.

Initiation of hemodialysis

Toshihide Naganuma, M.D., Ph.D.

Providing accurate and appropriate information regarding dialysis treatment and kidney transplantation to patients with stage 4G CKD and their families improves their life prognoses after renal replacement therapy. Ideally, CKD patients should be referred to a specialist before progression to stage 5G disease. This will allow patients to start preparing for renal replacement therapy. However, since the rate of estimated glomerular filtration rate (eGFR) decline varies among patients, patients with early-stage disease showing progressive reduction in renal function also require preparation for renal replacement therapy. This lecture will address the initiation of hemodialysis in CKD patients.

Vascular access for hemodialysis

Nobuhisa Shibahara, M.D., Ph.D. / Fumitaka Nakajima, M.D.

Vascular access (VA) is an essential component of dialysis treatment. VA procedures are becoming increasingly more difficult because of the increased number of long-term dialysis patients, elderly dialysis patients, and diabetic patients in Japan. The use of not only internal shunts (arteriovenous fistulas) but also grafts (arteriovenous grafts) and catheters is increasing. Knowledge of VA is important for doctors, nurses, and clinical engineers. In this lecture, I will discuss VA procedures, management, complications, and prognoses. I have prepared a gallery of clinical case photos to enhance your understanding.

Peritoneal dialysis

Hideki Kawanishi, M.D., Ph.D.

Peritoneal dialysis has been applied as a self-care and home-based procedure for patients with ESRD and has contributed to restoring and maintaining patients' social and family lives. In this lecture, peritoneal dialysis theory, devices, systems, and use in the clinical setting will be discussed.

Kidney transplantation

Kazunari Yoshida, M.D., Ph.D.

Renal (kidney) transplantation is the best treatment for patients with sudden loss of kidney function. Patients with end-stage kidney disease have to choose dialysis or renal transplantation to maintain their life. Approximately 25% and 60−70% of patients worldwide receive renal transplantation and hemodialysis, respectively. Although renal transplantation is advantageous with respect to quality of life, patient survival, and medical cost-effectiveness, it has several disadvantages. The main issue in transplantation is the need for a living or deceased donor. Another issue is the need for immunosuppression therapy to avoid rejection. Immunosuppressant drugs have evolved markedly over the last 20 years and continue to evolve. However, we still need to pay special attention to transplantation-related complications. Most transplantation-related complications are associated with immunosuppression, such as infection, metabolic disorders, and nephrotoxicity. Rejection is another major complication of renal transplantation. In particular, antibody-mediated rejection is a major problem in achieving long-term graft survival in renal transplantation therapy. In this lecture, we will discuss the current status of renal transplantation, the surgical procedure, post-transplant treatments, and prevention of treatment-related complications.

Pathology and management of hemodialysis complications

Haruki Wakai, M.D.

Various complications can occur during hemodialysis. Decreased blood pressure is the most common complication. Nausea, lightheadedness, depressed level of consciousness, muscle spasms in the legs, headache, arrhythmia, and ear congestion can also sometimes occur.
In this lecture, you will learn about the pathology and management of hemodialysis complications by watching a movie reproducing actual clinical situations.

Blood pressure control and water and sodium restriction in dialysis patients

Toru Hyodo, M.D., Ph.D.

Dialysis (ESRD) patients cannot pass urine because of chronic renal failure. Water and sodium control are vitally important in such patients. This lecture focuses on ways to restrict sodium and water intake in dialysis patients. Blood pressure control is also briefly discussed.

Anemia in CKD

Hideki Kawanishi, M.D., Ph.D.

Renal anemia is a major complication in patients with CKD, particularly those undergoing dialysis. However, recombinant human erythropoietin (rHuEPO) has been shown to be effective in the treatment of anemia associated with CKD. In this lecture, the basic theory, role, and international guidelines for use of rHuEPO therapy in CKD patients will be discussed.

CKD-Mineral and Bone Disorder

Toru Hyodo, M.D., Ph.D.

Mineral and bone disorder is a major complication in patients with CKD, particularly those undergoing dialysis, and is a problem that has yet to be conquered. In this lecture, the role of parathyroid hormone, phosphorus, and calcium in CKD and international guidelines for the treatment of CKD-MBD will be introduced.

Cerebrovascular disease in dialysis patients

Toshihide Naganuma, M.D., Ph.D.

Growing evidence suggests that CKD is a significant risk factor for stroke, subclinical cerebrovascular abnormalities, and decreased physical and cognitive function independent of known cardiovascular risk factors. Moreover, the prevalence of cerebrovascular disease is higher in patients with more advanced stages of CKD. Cerebrovascular disease is reported to be one of the major causes of death in dialysis patients. Furthermore, the incidence of stroke is higher in dialysis patients than in the normal population. In this lecture, cerebrovascular disease in dialysis patients will be explained.

Peripheral arterial disease in dialysis patients

Toshihide Naganuma, M.D., Ph.D.

Diabetes is a well-known risk factor for peripheral arterial disease (PAD) of the legs. CKD has also been reported to be an independent risk factor for PAD of the legs. It is known that PAD incidence is high among dialysis patients with stage 5D CKD and is associated with very poor prognosis. In the Dialysis Outcomes and Practice Patterns study (DOPPS), the worldwide and Japanese prevalence rates of PAD in dialysis patients are reported to be 25.3% and 11.5%, respectively. In this lecture, PAD treatment will be explained from a perspective of blood purification therapy including LDL apheresis.

Infection in dialysis patients

Toshihide Naganuma, M.D., Ph.D.

In general, dialysis is known to impair immune function and increase the susceptibility to infection. Dialysis has also been reported to reduce cell-mediated and humoral immunity. Uremic substances, malnutrition, acidosis, and renal anemia have been identified as potential contributing factors to immunosuppression. According to a nationwide statistical survey by the Japanese Society for Dialysis Therapy (as of December 31, 2013), infectious disease is the second-leading cause of death in dialysis patients (20.8%). Thus, infection is a serious concern in management of dialysis patients. In this lecture, the characteristics and management of infectious diseases in dialysis patients will be explained.

Diabetic nephropathy and diet control

Toru Hyodo, M.D., Ph.D.

Diabetes is the main cause of dialysis induction in many countries. In many developed countries, diabetes and CKD are managed individually by an endocrinologist and nephrologist, respectively. However, dialysis specialists must act as both endocrinologist and nephrologist when treating diabetic CKD patients. Thus, dialysis treatment in such patients has been difficult. Blood sugar control is very important in diabetic dialysis patients; however, an effective diet therapy has not been developed. Recently, carbohydrate counting has been shown to be a powerful method to control blood sugar in diabetic dialysis patients.
In this lecture, basic and advanced carbohydrate counting will be described by two dietitians, the President of the Japanese Society for Renal Nutrition, Ms. Tamura, and Professor Kitajima.

Diet therapy for CKD ~Low-protein diet~

Satoko Tamura, R.D.

Diet therapy is important in delaying CKD progression.
The purpose of diet therapy for CKD patients is to reduce the burden on the impaired kidney and remove waste products that cannot be filtrated.
Diet therapy for CKD patients involves the following:

1. Appropriate restriction of protein intake
2. Restriction of salt intake to less than 6 g per day (do not restrict it excessively.)
3. Sufficient energy intake
4. Restriction of potassium intake as needed.

In this lecture, I will discuss ways to reduce protein and salt intake by combinations of foods, and ensure adequate energy intake as well as appropriate cooking methods, with specific examples.

Diet therapy for dialysis patients ~Dialysis diet, diabetes control~

Yukie Kitajima, R.D., Ph.D.

The purpose of diet therapy is to avoid malnutrition and prevent the progression of various hemodialysis-related complications. The basics of the dialysis diet are as follows:

1. Control of salt and water intaker
2. Appropriate energy intake
3. Appropriate protein intake
4. Control of phosphorus and potassium intake

It is most important for dialysis patients to restrict salt. This lecture will focus on ways to control water intake and ensure adequate energy and protein intake in dialysis patients. In addition, I will discuss ways to reduce carbohydrate intake for glycemic control in diabetic dialysis patients.

Diet therapy to control mineral balance ~Phosphorus restriction~

Yukie Kitajima, R.D., Ph.D.

Phosphorus is almost exclusively excreted by the kidneys. Therefore, hyperphosphatemia is frequently seen in patients with CKD. Hyperphosphatemia is a risk factor for cardiovascular disease and is associated with the development of secondary hyperparathyroidism and ectopic calcification. Phosphorus is a nutrient contained in many foods. It is important for CKD patients to monitor their daily dietary phosphorus intake. In this lecture, you will learn about phosphorus-rich Cambodian foods and how to control phosphorus intake.

Diet therapy to control mineral balance ~Potassium restriction~

Satoko Tamura, R.D.

Impaired kidney function can decrease renal potassium excretion, leading to high potassium concentration in the blood. Increased concentration of potassium in the blood can strain on the heart.
This lecture will cover foods high in potassium and cooking methods to reduce potassium content with specific examples. Dietary habit in Japan is different from that in Cambodia. Together let's think about what foods and dishes in Cambodia have high and low contents of potassium.

Physical characteristics of patients with renal failure and exercise therapy for patients with renal failure

Yuki Tateno, P.T., B.A.

Patients with renal failure can have various concurrent diseases, which cause a wide range of physical functioning abnormalities. Therefore, it is necessary to fully understand these associated disorders for prevention and treatment.
This lecture will promote a better understanding of the physical characteristics of patients with renal failure and examine the use of physical therapy to prevent and treat associated health disorders in these patients.

Japanese health insurance system and health economics of dialysis treatment

Rika Yamanaka, B.A. / Tomoko Watanabe, A.A.

Dialysis treatment is an expensive treatment, and the cost of providing dialysis treatment to many patients is a global issue.
This lecture will introduce the Japanese health insurance system and examine the financial issues associated with dialysis treatment.

Dialysis facility management

Hirokazu Matsubara, B.E.

This keynote lecture describes in detail the necessary procedures for the effective operation of a dialysis facility with emphasis on facility management. Subjects will include staff management and customer service. It is recommended that every staff member be proficient in providing information to patients that high level professional medical care is both affordable and within the patients reach. We believe this information is not only essential for facility owners but also for its employees.

Daily workflow of nurses and clinical engineers at a dialysis clinic

Miku Tanabe, R.N. / Natsumi Abe, C.E., M.T.

Although dialysis requires the cooperation of many medical professionals, nurses and clinical engineers perform most of the daily work.
In this lecture, we will explain the work performed by nurses and clinical engineers at a standard dialysis clinic in Japan through the use of video footage. We believe that this virtual experience will allow you to familiarize yourself with dialysis treatment. Time has been allocated for questions and answers. Please feel free to ask any questions you may have.

Blood purification therapy

Takayuki Abe, C.E., M.S. / Kenichi Kokubo, Ph.D.

Hemodialysis, hemofiltration, and hemodiafiltration are used to treat patients with end-stage renal failure. Other blood purification therapies, such as plasma exchange, direct hemoperfusion, double filtration plasmapheresis, and plasma adsorption, are categorized as apheresis and are used to treat many kinds of disease. In this lecture, the basic concepts, methods, and characteristics of blood purification therapies will be discussed.

Determinants of solute removal efficiency during hemodialysis and hemofiltration

Takatoshi Sakurasawa, C.E., B.S. / Kenichi Kokubo, Ph.D.

Dialysis efficiency depends on many factors. From an engineering point of view, operating conditions, such as blood flow rate, dialysate flow rate, membrane area, and solute permeability of the dialysis membrane, are important determinants of dialysis efficiency. This lecture will explain how operating conditions affect dialysis efficiency.

Kinetic models of hemodialysis

Kenichi Kokubo, Ph.D.

Single and multiple-compartment models of hemodialysis are capable of describing solute concentration changes in the blood during hemodialysis. In this lecture, the basic concept and theory of the compartment models will be explained and the solute concentration changes during hemodialysis calculated by the models will be demonstrated.

Indices of dialysis adequacy

Takatoshi Sakurasawa, C.E., B.S.

Adequacy of dialysis is a measure of how well the dialysis is working. Several indices, such as Kt/V, reduction ratio, M/C(0), creatinine generation rate, and time-averaged concentration of blood urea nitrogen, are used to evaluate the adequacy of dialysis. In this lecture, the basic concept and theory of dialysis adequacy and dialysis adequacy indices will be explained.

Equipment required for dialysis therapy

Kenichi Kokubo, Ph.D.

To safely carry out dialysis therapy, the dialysis machine should be capable of controlling extracorporeal circulation and fluid removal rate, temperature, and dialysis fluid concentration; monitoring blood pressure in the circuit; and detecting bubbles in the blood circuit and blood leakage from the dialyzer. In this lecture, equipment required for hemodialysis will be explained.

The extracorporeal circuit, anticoagulants, and dialysis fluid used for hemodialysis

Takayuki Abe, C.E., M.S. / Shunichiro Urabe, C.E., M.S.

Extracorporeal circulation was established along with the development of dialysis therapy and enables us to modify blood taken out from the body, i.e., to remove toxins from the blood and to correct electrolyte concentration and pH of the blood. Extracorporeal circulation requires an appropriate amount of anticoagulant and a sterilized extracorporeal circuit. Electrolyte composition of dialysis fluid is determined so that metabolic acidosis and electrolyte concentration can be corrected. In this lecture, the extracorporeal circuit, anticoagulants, and dialysis fluid used for hemodialysis will be explained.

Dialyzers used for hemodialysis

Shunichiro Urabe, C.E., M.S. / Kenichi Kokubo, Ph.D.

Dialyzer is the main component of the hemodialysis machine, in which mass transfer between blood and dialysis fluid through the dialysis membrane occurs, uremic toxins accumulated in the blood are removed, and electrolyte concentration and pH are corrected. In this lecture, dialyzer structure, dialysis membrane material and biocompatibility, and dialyzer classification according to solute removal efficiency will be explained.

Quality management in dialysis fluid purification

Tomotaka Naramura, C.E., Ph.D.

Quality assurance of dialysis fluid purification is a vital component of dialysis treatment. Toll-like receptor-mediated cytokine production can result from bacterial endotoxin contamination of dialysis fluid during dialysis treatment. Both scheduled and random water quality testing need to be performed in conjunction with equipment maintenance, such as the evaluation of the endotoxin retentive filter and daily inspection of the reverse osmotic distribution network for quality conformity. This lecture will cover quality assurance methods and problems faced during the dialysis fluid production process.

Maintenance and inspection of dialysis equipment

Ayumi Takizawa, C.E.

Dialysis equipment should work correctly. Lack of consistency between dialysate inflow and dialysate outflow and fluid removal and improper control of dialysate concentration will directly result in a life-threatening event. Inspection of dialysis equipment before, during, and after use is a very important task for medical staff (the dialysis machine also provides some automated inspection). Scheduled maintenance and inspection should also be performed every 6 months. In this lecture, the basic concept and practice of dialysis equipment maintenance and inspection will be explained.

Infection control in the dialysis room

Emi Kimura, C.E. / Kenichi Kokubo, Ph.D.

In the dialysis room, infection can be transmitted from patient to patient through contact with medical equipment and/or medical staff. The standard precautions provided by the Center for Disease Control and Prevention can be applied for infection control and prevention in the dialysis room. This lecture will cover the standard operating procedure for dialysis therapy and practical methods of infection prevention in the dialysis room.

Patient assessment and vital sign monitoring during hemodialysis

Tomotaka Naramura, C.E., Ph.D.

Patient assessment and vital sign monitoring during hemodialysis is important to reduce treatment-related risks and to determine the appropriate operating conditions. In this lecture, effective patient assessment and vital sign monitoring during hemodialysis will be discussed.

Introduction of devices related to dialysis

Kaname Sadahiro
Nipro Corporation
General Manager
Products Sales and Development. Domestic Division

Session 1: Nipro Corporation Company Profile, Dialysis Machine, and Needle Removal Detector

In the first session, we will provide an overview of the Nipro Corporation company profile and the company's dialysis machine and needle removal detectors. Using video and PowerPoint presentations, we will show how our dialysis machine allows for precise water removal and the new functions available on our latest machine. In addition, you will be allowed hands-on access to compare older and newer needle removal detectors during the ""Touch and Use" section of the session.

Session 2, Dialyzer, Needle, and Buttonhole Kit

In the second session, we will introduce Nipro dialyzers and needles. In the "Touch and Use" section of the session, you will have hands-on access to Nipro needles including their clamps, safety mechanisms, and check valves. Moreover, we will show you the Nipro Buttonhole Kit and Dull Arteriovenous Fistula Needle.

Schedule

March 29 ~ April 5, 2015

Place

International University (IU):
No 89-95, St.1984-1911. Phnom Penh Thmey, Sen Sok, Phnom Penh, Cambodia

Seminar program

The program (time schedule) will be publicized in the last decade of February or later on the following website:
http://www.cambodia-dialysis.com/

Privilege for participants

- JAC-DSC will issue a certificate of seminar completion to participants with an attendance rate of 60% or higher who achieve the specified score or higher on the final test.
- An English textbook on dialysis will be given to participants with an attendance rate of 60% or higher who rank among the top 14 based on the final test score.
- One or two particularly excellent participants who satisfy all of the following criteria will be invited to attend a 10-day training course in Japan.

1. A participant with an attendance rate of 60% or higher and an excellent final test score.
2. A participant who is highly motivated and qualified to become a dialysis healthcare professional.
3. A participant with a certain level or higher English skills.
4. A participant who is courteous and follows the rules.
5. A participant who is in good health and without infectious disease.
6. A participant who wishes to participate in the training in Japan and can obtain family consent.
7. A participant who can obtain a passport.

* Selection will be made by the JAC-DSC. Objections to the selection results will not be allowed.
* The training will take place in or near Tokyo, Japan, in August or September 2015. The participants will receive practical training at several medical institutions and universities. They can join a tour of Tokyo as an extracurricular activity.
* The JAC-DSC will pay for the following training expenses: airfare, hotel, meals, travel insurance, transfer fee, Cambodia International Airport tax, and reference materials.

How to apply

Please e-mail your information to
iu2015seminar@jac-dsc.org
Please write,
your name, age, female/male, e-mail address, phone number, occupation, institute and department that you belong to (university, school, hospital, clinic, corporation, etc.),
in your e-mail.
Your e-mail will be forwarded to both of JAC-DSC staff and IU staff automatically.

*Participants need to pay "20 USD" to cover venue preparation costs.
*Seminar registration information will be available in the last decade of February or later on the following website, too.
http://www.cambodia-dialysis.com/






JAC-DSC

Japanese Assistance Council of establishing
Dialysis Specialists system in Cambodia