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PROVIDING A GLOBAL PERSPECTIVE TO PHARMACY STUDENTS WITH AN EXCHANGE VISIT TO JAPAN

We left the University of Findlay on a Wednesday morning. After 29 hours of plane and car travel, we finally arrived in our dormitory accommodations in Nobeoka, the home of the College of Pharmacy at Kyushu University of Health and Welfare (KUHW). We were received by our hosts, Shuji and Junichiro, both of whom have visited the University of Findlay in the past fall semesters. When we arrived it was (do not put a dash here) Thursday night in Japan, and the sun had already set behind the many mountains.

Upon arrival Jun showed us to our rooms, located on the 3rd floor of a dorm-like facility, which is reserved for guests, and in a methodical Japanese way - we received our keys, instructions, itineraries, and full sized umbrellas! Except for these instructions, everything was written in Kanji, with no English subtitles. Therefore the installation of translation programs on our mobile devices was essential. We used the program for interpreting just about everything, including menus, goods at the store, and conversations.

The morning came quickly, between 4:00 and 5 am, with sunrise usually before 6 am. The view from our dorm windows was mountainous and pleasant. We were greeted daily with calls from the bush warblers. We walked about $\frac{3}{4}$ of a mile past a covered motor bike parking lot, soccer and baseball fields, and a courtyard. Just before the

courtyard was a small 7-Eleven, where we could get coffee, simple groceries and supplies. Just past was the student cafeteria, where breakfast was prepared daily for us during the week. The food that is served is not what is considered normal breakfast food in the US and included at least 2 or 3 of the following every day: egg salad sandwich, pork cutlet sandwich, fried chicken, fried fish, mussels, some kind of pickled root veggies or cabbage, fruit and a very large glass of juice.

The courtyard contained a beautiful fountain surrounded by a large round trellis covered with Japanese wisteria, and many benches. During the day this place was crisscrossed by KUHW students; in the evening the area was used for practice of traditional Japanese music and dance.

One of our pharmacy students was already present at KUHW, where he had taken a year off from UF to teach English at English Village on campus. He was fluent in Japanese, and was invaluable when translating for us at our pharmacy visits. He often accompanied us on sightseeing tours and during educational experiences.

We were introduced to the campus and College of Pharmacy on day one, and then followed a schedule daily, which included a mixture of pharmacy tours and lectures/labs, classes, interesting food and sightseeing. All pharmacy departments were eventually covered including pharmacy practice, medicinal chemistry, biochemistry, genetics, compounding and others.

After breakfast Monday through Friday for two weeks, we met on the 3rd floor of the pharmacy building, where KUHW faculty would take about an hour to present their research. We would then attend a class, visit a pharmacy cultural site. We returned to the cafeteria at 5 pm daily for a large dinner that was presented by several faculty and students. We would get to know one another, share stories and play games, then return to our dorm rooms to prepare for another day.

During the day, faculty and their students always made sure that we were well fed and we were often treated to tea and/or snack breaks. They provided us with several sight-seeing and cultural experiences during the week; these were intermingled with our educational sessions. Depending on the day, we



were passengers, driven along continuous winding roads through lushly covered cedar and bamboo mountains, in their very nice compact Japanese cars, on the left side of the road, past views of the ocean, alongside rice fields, tea and tobacco farms, and many traditional Japanese homes, through many tunnels, with glimpses of the sparkling Pacific ocean in the distance.

Classroom Activities

Our faculty and students were provided with a variety of lecture and lab activities. English translations of the presentations and activities were provided .

Research presentations by faculty included the following: *Water-soluble jack-knife prawn extract and how it inhibits 5-hydroxytryptamine-induced vasoconstriction and platelet aggregation in humans*; *The effects of diabetes mellitus on 5-hydroxytryptamine-induced constriction of isolated human internal thoracic artery grafts in coronary artery bypass grafting*; *Comparison of Cultivars and Seasonal Variation in Blueberry (Vaccinium Species) Leaf Extract on Adult T-cell Leukemia Cell Line Growth Suppression*; *Electron Ionization Mass Spectrometry-based Metabolomics Studies of Sophora flavescens can Identify the Geographical Origin of Root Samples*. Labs included synthesizing wintergreen, demonstration of fluorescence , an experiment measuring the hardness (dissolved mineral content) and taste of different waters, including tap water, Japanese spring water and Evian (French spring water). We made folded powder papers (cyproheptadine), compounded indomethacin gel and azunol ointment (not available in the US); and operated powder packaging machines (a popular dosage form in Japan) and isolated DNA.

KUHW had approximately 20 SimMen (working models of men, women and children), each connected to a computer that measured vitals. Each could present with bowel sounds, open eyes, sweat, cry, and had breathing and heart sounds. The computer programs for each SimMan could be set to demonstrate a particular case, such as an asthma attack, an allergic reaction to an antibiotic (anaphylaxis), or death due to rapid administration

of IV potassium chloride. A variety of cases was presented to our pharmacy students, who participated in the ‘treatment’ of the various maladies.

The Administration, distribution, metabolism, excretion (ADME) puppet was thoroughly enjoyed by all of the pharmacy students. The faculty involved in making this puppet published an article on its effectiveness in teaching patients about drug effects and interactions on the body.

Tours of Retail and Hospital Pharmacies

On separate days we toured two completely different retail pharmacies (owned by the same pharmacist, Mr. Tomatika), then two hospital pharmacies; one a smaller hospital (Nishida) and one a larger (Miyazaki) hospital pharmacy.

Of the retail pharmacies, one was a more “traditional” pharmacy, similar to a larger but older independent pharmacy, owned by Mr. Tomitaka, who was 78 years young. Mixing and packaging of both Chinese and Japanese herbals (they are quite different from one another!) were discussed at length. We were given a tour of the compounding area, where over 400 different standard herbal medications were compounded. 430 preparations are approved by the authorities; 421 require pre-approval by a physician, and 9 of them may be compounded and dispensed without a prescription. We were each provided with samples of a vitamin-filled “hangover medicine”. This interesting preparation was strangely labeled as follows: “Korean ginseng (made in Japan) (hot water splitting of 30 ml of young rescued oral solution); beef tincture, tocopherol, thiamine, riboflavin, pyridoxine, nicotinic acid amide compounded.” We all put it to the “taste test”; some wincing occurred.

Mr. Tomitaka only spoke softly and in Japanese, but provided us with the history and philosophy of his pharmacy business. His assistants and our faculty guides, also soft spoken, provided translations. We asked many questions, and even then the answers were sometimes hard to understand even with interpretation, but we all did our best, and it was wonderful. Our students were fascinated by his



presentation from the seat behind his pharmacy counter, which was covered with preparations and products. He continues to build his independent business on principals taken from his apparent continued self-education and referred to good service, philosophies and patient welfare, versus only doing business for profit. He mentioned some principles learned from Walgreens and the Ritz Carlton: prompt service, customer satisfaction, friendly phone conversations, appearance of store and personnel, and providing “thrilling” experiences. He emphasized the need for developing holistic pharmacists. Japanese pharmacies had once been the manufacturer of medications, and it was his opinion that “in-house preparation” (that is, compounding), is the original form of pharmacy and is the spirit of pharmacists. We later traveled to the “other” Tomitaka pharmacy, a “clinical pharmacy” where services such as vaccination, hemoglobin A1C and blood sugar testing, bone density measurement, blood pressure checks and both sterile and non-sterile compounding were provided. Durable medical equipment and home delivery were also offered. We were not allowed to tour the back room until we removed our shoes and wore the slippers provided.

The pharmacy was managed by a faculty member from KUHW, who provided the point of care testing and vaccinations. They were very concerned with patient comfort in the waiting area, which was indeed serene, decorated with a dark wood paneling, floors, and shelves. It was a clean, organized atmosphere. The interior of the clinical pharmacy was striking, with neatly organized OTC products and supplies and were topped with an extensive collection of large model motorcycles. Two very large aquariums with exotic sea life were arranged so that customers were able to enjoy them while sitting. A glass room held a small garden and koi pond. This atmosphere was purposefully created to help patients relax while waiting for their service or prescription.

Tomitaka believes that a core function of a pharmacy is to be a medical service provider; he believes that providing clinical services justifies the existence and improves the value of a pharmacy. He believes that a 24 hour service and

good communication skills are critical for pharmacy practice. He emphasized the need for proactive working relationships with other healthcare professionals and patients. In his handout, he wrote that “...the pharmacist’s role is to enlighten and support the community, to promote and maintain health, provide mental support, provide support to self-medicate, encourage clinic visits if needed, support nursing care at home, provide curative services in early stage of “light diseases”, guide self-drug administration, help lifestyle habit change, and partner with other health facilities and using care services.” This sounds like a great way to practice pharmacy to me.

The experiences and practice types at Nishida Hospital and Miyazaki Hospital pharmacies had similarities and differences between each other and hospital pharmacy practice in the US. In each pharmacy we dressed professionally, wore lab coats, removed our shoes and wore slippers, and were given tours of the main pharmacy, pharmacy satellites, and the floors where patient care occurred. Daily operations appear very similar to those in the US, with unit dose carts, computers, narcotic and clean rooms, drug management and drug information resources with written formulary, and manufacturing areas. The main differences included the powder packaging machine and subtle differences in the use and storage of compounding supplies and equipment.

The Nishida Hospital tour (about 260 beds) was hosted by KUHW faculty and case presentations were given by the hospital pharmacists. Cases were similar to those that clinical pharmacists or APPE students would encounter in the US, and included a case on pneumonia using an extended spectrum beta-lactam antibiotic (ESBL) in 91 year old woman, a case involving supra ventricular tachycardia, (SVT), and one on cerebellar hemorrhage. Each case provided a step wise plan similar to a Subjective/Objective/Assessment/Plan (SOAP). The older students, our student pharmacist interpreter and I, did our best to explain the cases to the younger students; and the similarity to US practice. Our pharmacy student/interpreter was present and very useful to the presentations at both hospitals. The students also participated in several “hands on” activities at the hospitals including



weighing, measuring, using an ointment mixer and powder packaging machine.

The 632 bed University of Miyazaki Hospital had 18 departments, including a prominent cancer center. Research played an important role, where there are approximately twenty phase 2 to 3 investigational studies in progress. Also notable was that pharmacists themselves analyzed the narrow therapeutic index and aminoglycoside/vancomycin drug levels in their own laboratory, and would teach the nursing staff the proper times to draw those labs. KUHW P3 students learn how to do the analysis in their coursework. This is not done in the US. On the floors, a clinical pharmacist checks meds, monitors medication use, makes formulary substitutions, checks all doctor's orders, and contacts the prescriber if necessary, which is very similar to US practice. There is an attempt to counsel all patients on all medications and about 30-40 patients seen daily. Upon questioning by our faculty about concerns with hospital infections, the Japanese pharmacist explained that The Center for Infection Control (CIC) at this hospital saw that methicillin resistant staph aureus (MRSA) is probably the most common problem, with extended spectrum beta-lactam resistance on the increase, and the most unusual recent infection being *Cryptococcus*.

Excursions, Culture and Inspiration

During the week, the KUHW faculty and host families transported us to variety of important cultural sites in the area. UF faculty and students spent the day with different Japanese host families on weekends. Each traveler experience was unique and notable. Highlights included but were not limited to Hyuga, the Inazumi caves, the Saitobaru Burial Mounds, Takachiho Gorge (the origin of Japan), Aya castle and art colony, castle and samurai house ruins from the Edo period, a tea house and traditional tea ceremony, a tea farm and factory, and Mounts Aso, Atagoyama, and Mukabaki.

The flower, tree and medicinal herb gardens on the KUHW campus were inspirational and deserve a mention here. Upon return to the United States, I

applied for a grant to start a medicinal herb garden at UF. It was dug and prepared by students and a local greenhouse; and has been planted with over 50 plants by our pharmacy faculty and staff. The garden will be used to inspire students to relate to and research plant medicine, and to bring the entire UF campus community together.

Our time with our Japanese colleagues was inspiring and memorable. We each had spent time with the majority of the faculty and many students. Their beautiful Japanese names were each so unique and difficult to pronounce and remember, but our hosts made us feel better by shortening them into nicknames. A going away dinner with plenty of hugs, pictures together, and some tears provided evidence of our special time together. The final day was spent debriefing, which was important, and we shared our favorite experiences. KUHW faculty also encouraged us to explain what could be improved. We left KUHW on a Friday for Tokyo for a 3 day excursion guided by Chris Sippel, Dean of International Studies. That is a different story.

We will never forget you, Japan and KUHW.