

# Clinical Reasoning in Kampo Education for Teaching Kampo Beginners

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**Objectives:** Japanese traditional (Kampo) medicine has its own theories that are quite different from those of Western medicine. For many students and medical doctors, mastering it is a painstaking task. We examined the similarities in clinical reasoning between Western and Kampo medicine, and developed an easy-to-understand method to teach Kampo theories enabling physicians to make accurate diagnoses and choose suitable Kampo formulae.

**Methods:** We developed a teaching method for Kampo medicine along clinical reasoning for beginners and evaluate its availability and effectiveness in an actual team-based learning class.

**Results:** A Kampo diagnostic procedure similar to that in Western medicine was developed. In this method, some Kampo formulae, are chosen according to the chief complaint, concomitant symptoms, characteristics, and distribution and exacerbation factors. Subsequently, from a point of view of the chosen Kampo formulae, patients' signs and symptoms are matched to find the most suitable formula. Students chose the same suitable formula among 6 groups and gained confidence to choose the correct Kampo formulae.

**Conclusions:** A new Kampo educational method was developed that raises students' and physicians' confidence in making diagnoses and prescribing Kampo medicines.

**Key words:** Kampo education, Novices, Clinical reasoning, Questionnaire survey

## INTRODUCTION

Japanese traditional (Kampo) medicine was introduced from China long ago and has its own theories, which are completely different from those in Western medicine and are indispensable for practicing Kampo medicine with a high level of efficacy and patient satisfaction. It is more effective to use Kampo medicine in its own traditional ways, part of which is known as “*Sho* (pattern)”-based therapy or clinical-pearl “*Kuketsu*”-based therapy, in Kampo clinical settings. “*Sho*” consists of various components (e.g., “Yin and Yang”, “Deficiency and Excess”, “Exterior and Interior”, “Cold and Heat”, “the Five-element Doctrine”, “the Six Stages of Disease Transformation,” and “*Qi*, Blood, and Water”) which translate to “physiology and pathology” in Western medicine. Kampo specialists determine patients' “*Sho*” from Kampo specific diagnostic procedures which consist of inspections (tongue inspection), listening examination, medical interview, and palpation (pulse examination and abdominal examination, among others) [1]. Once the patient's “*Sho*” has been determined, the most suitable Kampo formula is automatically determined according to traditional theory. However, these series are very complex and require a long time of study and experience to comprehend. In the past, these traditional diagnostic theories and methods were traditionally taught in the apprentice system (e.g., apprentices learned them by personal observation and actual physical experience in master doctors' offices. These issues caused in Kampo education to be impractical for many students due to

the limited lecture time.

On the other hand, providing Kampo medicine to patients has been approved if the prescribing physician has a valid Japanese medical license. That is to say, Japanese physicians are able to prescribe Kampo medicine in their daily practice without acquiring any other special training or license. Over the years, Kampo therapy has become increasingly popular among Japanese people [2-4]. Moreover, 70% to 90% of Japanese physicians regularly prescribe Kampo medicine in their medical care according to clinical evidence and reports of mechanisms of action and/or by following guidelines from modern Western medicine [5-7]; while Kampo specialists determine patients' “*Sho*” in order to decide what Kampo formula to prescribe. For many physicians who mostly learned Western medicine, understanding Kampo theories will be difficult and mastering them will require an extensive amount of time coupled with experience. Therefore, we examined the similarities in clinical reasoning between Western and Kampo medicine, and determined those acceptable for physicians and students who practice in Western medical settings. Thereby, we developed an easy-to-understand method to teach Kampo theories to diagnose a patient's condition and choose the most suitable Kampo formula. The final purpose of this method is so that Kampo novices will more easily become accustomed to introducing the most precise Kampo medicine into their daily practices, and so that medical students will become more interested in Kampo medicine. Accordingly, in this new educational method, essential information to determine the most

adequate Kampo formulae to write prescriptions is predominantly gained from medical interviews and visual inspections, and the findings of these traditional examinations are applied while, if needed, referring to textbooks. This method, to some extent, follows the traditional diagnostic procedure in which it is imperative for Kampo specialists to determine the “*Sho*”.

## METHOD

We develop a teaching method along clinical reasoning of Kampo medicine for novices. At first, the diagnostic procedures in Western medicine and in Kampo medicine were examined and their similarities were described. We subsequently prepared a reference table, which was a tool of choosing possible Kampo formulae according to the patient's chief complaint, concomitant signs and symptoms, characteristics, distribution, and exacerbation factors.

After developing this new teaching method, we evaluated its effectiveness in a pharmacy team-based learning (TBL) class by comparing the process of choosing Kampo formulae. A total of 24 students who attended their fourth-year program at Faculty of Pharmaceutical Sciences, Tohoku University were selected for the present study. The students practiced clinical reasoning exercises five times in their classes and reported three exercises as homework. At the end of the classes, they were allocated to six small groups (4 students per group) and examined stand-in patients to identify some Kampo medical problems with a focus on the patient's chief complaints.

Questionnaire surveys were conducted before and after the Kampo education program. To prepare the questionnaires for the present study, we used the semantic differential method to assure their validity [8]. For statistical analyses, the Wilcoxon signed-rank test was used to examine the relationship between data obtained before and after the education program. The statistical analyses were performed in pairs.  $P < 0.05$  was considered statistically significant.

## CASE REPORT

A 64-year-old man came to our Kampo clinic, in March 2015, with the chief complaint of headache. He had sometimes suffered dull headaches when he was younger. His blood pressure began to rise from when he was 55 years old and gradually increased to higher than 160 mmHg. At that time, he suffered periodic headaches. Two years before he consulted our clinic, he took some Kampo medicine, recommended at a drug-store, with the result that his blood pressure decreased to 150 mmHg, but he still sometimes suffered from headaches and took an analgesic once a week. He took no western medicine regularly.

His headache was throbbing without nausea and not caused by rainy days or early in the morning. He always felt a hot flush and experienced tinnitus, but had no dizziness, insomnia, irritation, or epistaxis. He had no history of drinking or smoking. He had a robust and well-muscled body, 152 cm tall and weighed 56 kg. He had a strong pulse. His complexion looked dark. His tongue was dark red with thick, yellowish white moss. The sublingual vein was slightly swollen. His physical examination was unremarkable except for resistance at the epigastric region, the so-called

“shinkahiko” sign in Kampo medicine. There was no edema in the extremities. The routine blood chemistry, liver function tests, and urinalysis were normal.

## RESULTS

### Similarity in clinical reasoning between Western medicine and Kampo medicine

To elucidate similarity in clinical reasoning between Western medicine and Kampo medicine, we first refer to a schema (Fig. 1). In Western medicine, there are three major steps from hearing a patient's complaints to a diagnosis. First, physicians grasp the patient's conditions by means of a medical interview, visual inspection, palpation, and auscultation, which are influenced by the interview procedure itself. Then, they determine a plausible disease and add any other possible diseases to their differential diagnoses. Finally, they establish a diagnosis by performing several tests (e.g., blood tests, diagnostic images, physiologic tests, and pathological exams, among others), which are determined by the suspected diseases, to exclude some diseases on the differential diagnoses or to determine the most likely disease. Likewise, Kampo medicine has a similar diagnostic pathway. First, physicians determine the patient's conditions by conducting a medical interview, visual inspection, listening examination, and palpation. Then, they select a plausible Kampo formula and any other possible Kampo formulae. Finally, they decide the most suitable Kampo formula and write a prescription, referring to repeated references to the patient's information, which is assumed from the selected Kampo formulae in order to exclude differential possibilities of Kampo formulae or to decide the most likely Kampo formula to be prescribed. This patient information is already gained at the first step or is acquired later as necessary.

### The actual teaching process of choosing Kampo formula along with clinical reasoning (the matching process)

We developed the Kampo teaching process, based on the proposed theory.

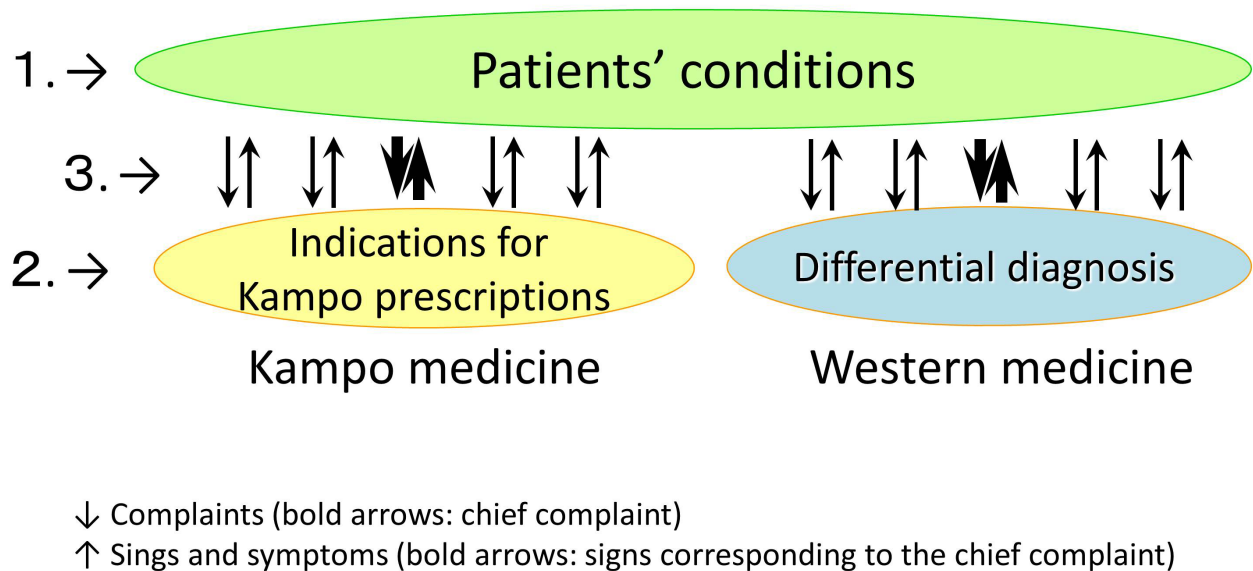
A case report of an actual case is applied in this process. People attending a class are allowed to refer to Kampo textbooks when necessary. The matching process is described as follows.

1. Determine the therapeutic target, which is the “chief complaint” in most cases, e.g., headache, dysmenorrhea, and abdominal pain, among others.

In the presented case, the chief complaint was headache. Students and/or physicians then refer to the headache reference table (Fig. 2).

2. Narrow the possible formulae down according to the chief complaint to approximately three in consideration of: 1. concomitant signs and symptoms, e.g., hot flush, hypertension, vertigo, irritation, and nausea, among others; 2. characteristics, e.g., deficiency or excess pattern, among others, and distribution, e.g., the upper body and limbs, among others, and 3. exacerbation factors, e.g., the day's weather, rain or snow, chill, low pressure system, among others. According to that information, possible formulae are chosen from textbooks or from the high and medium indication columns in the reference table (Fig. 2).

In the present case, concomitant signs and symp-



**Fig. 1** Similarity of the process of clinical reasoning between Western medicine and Kampo medicine

1. Clinical ability to determine the patients' conditions (Western medicine: medical interview, visual inspection, palpation and auscultation; Kampo medicine: medical interview, visual inspection, and listening examination, palpation)
2. Basic knowledge about (Western medicine: differential diagnosis; Kampo medicine: indications for each Kampo prescriptions)
3. Clinical experience to choose the appropriate (Western medicine: diagnosis from results of tests and gathered information; Kampo medicine: Kampo prescription from gathered information)

toms are hot flush and tinnitus. Nausea, dizziness, insomnia, irritation, and epistaxis are not mentioned. The patient has a robust, well-muscled body and a strong pulse, which means he is of the "excess" pattern. The weather, rain, or the morning time are not exacerbation factors.

3. List several signs and symptoms to determine the possible formulae (Fig. 3) to write a prescription.

4. Complete the SP (signs and symptoms-prescription) matching table by using ◎, ○, △, and ×, which indicate: high, medium, low, and no effectiveness, respectively, between signs and symptoms and the formula to be prescribed (Fig. 3).

This is done by referring to the reference table.

5. Considering steps 1 through 4, choose the most appropriate prescription for the patient at each step.

In this case report, *orengedokuto* is finally selected. The other possibilities would be the second or third choices.

#### Availability and effectiveness assessment of the teaching method in an actual TBL class


The students proposed three or four possible formulae and referred to their textbooks to verify the correspondence between the identified medical problems and the indications for a Kampo formula. They completed the Kampo SP matching table (Fig. 4) for the simulated patient. They then chose the most suitable Kampo formula. By the clinical reasoning method using the SP matching table for teaching Kampo medicine, even pharmacy students with no clinical experience could choose the same formulae, including other possible formulae, that Kampo medicine experts generally choose and give reasons for their choices (Data not shown).

All 24 students issued and responded to the questionnaires before and after the education program. Before the education, 8% of the respondents had very good impression of Kampo medicine, and 9% thought it was very interesting. These results were increased to 46% and 62% after the education, respectively ( $p < 0.01$ ). Although 8% of the students said that they would prescribe Kampo formulas by their own decision after they become practicing pharmacists before the education, after the education, this consideration increased to 46% ( $p < 0.01$ ).

#### DISCUSSION

An easy-to-understand education method to teach Kampo medicine along with clinical reasoning for novices was developed by finding similarities between Western and Kampo medicine. Its availability and effectiveness were demonstrated in an actual TBL class.

Kampo medicine has its own theories that are quite different from those in Western medicine. Kampo specialists actually apply them to their daily practices, however, mastering them requires years of study and experience for novices. In Korea and China, the license to prescribe their own traditional medicine is acquired after graduation from schools that differ from the teachings of Western medicine [9]. Oriental medicine also has a unique, large learning field. In Japan, the mean number of required Kampo class meetings in all 80 medical schools was 7.3 times, as we previously reported. Even if elective class meetings were added, it would still only be 8.8 times [10]. Compared with the other two countries, the class meetings of Kampo medicine are few, although the one Japanese medical license approves both Western and Kampo medicine, meaning that physicians can prescribe Kampo medi-

Effectiveness Formula	High (◎)	Medium (○)	Low (△)
Orengedokuto (黄連解毒湯)	hot flush exciting itching	epigastric distension headache Insomnia bleeding	hypertension
Ryokeijutsukanto (苓桂朮甘湯)	dizziness vertigo	headache palpitation hot flush	oliguria
Chotosan (釣藤散)	headache (early morning)	conjunctival injection	Insomnia hot flush hypertension dizziness
Goshuyuto (呉茱萸湯)	headache nausea		coldness in extremities
Goreisan (五苓散)	headache edema thirst a decrease in urinary volume	carsick (motion sickness) dizziness nausea	diarrhea
			
Keishininjinto (桂枝人参湯)	headache	heartburn diarrhea loss of appetite woozy/faint because of being overheated weakness of digestive function	Fatigability coldness in extremities

**Fig. 2** Reference table

This reference table is to help the physician choose some possible Kampo formulae by first referring to the high and medium columns.

After selection of some possible Kampo formulae and writing the prescriptions in the SP matching table (Fig. 3), the degrees of effectiveness of those are indicated.

cine immediately after getting their license. Meanwhile, medical students' interest in Kampo medicine is high. We conducted a questionnaire survey on the awareness of Kampo medicine of the 4th-year students of Tokai University School of Medicine, revealing that 98% of them were interested in Kampo medicine and 93% would prescribe Kampo formulas in the future [11]. This situation indicates that a short and effective educational program in Kampo medicine is essential for students. Additionally, there should also be a program to teach busy physicians who do not have sufficient time to learn traditional Kampo theories but already prescribe Kampo medicine in their daily practices.

To discover the similarities in clinical reasoning between Western and Kampo medicine, we described a quite simplified process, although clinical reasoning in Western medicine is complex and has often been

reported [12–15]. In Kampo medicine, clinical reasoning is also more complex than often meets the eye. If referring to procedures in old Kampo textbooks, Western medical diagnostic procedures and referring to procedures in clinical evidence, among others, are incorporated into that clinical reasoning. The reason the current procedure is simple is that essential information is primarily from the medical interview and visual inspection. Findings of traditional examinations are applied while referring to textbooks as needed.

After having understood the actual differences among the procedures of Kampo specialists, we developed a new easy-to-understand Kampo teaching method especially for novices to allow them to choose correct Kampo formula, to prescribe it, and to perk their interest in Kampo medicine.



## Kampo SP (signs and symptoms-prescription) matching table

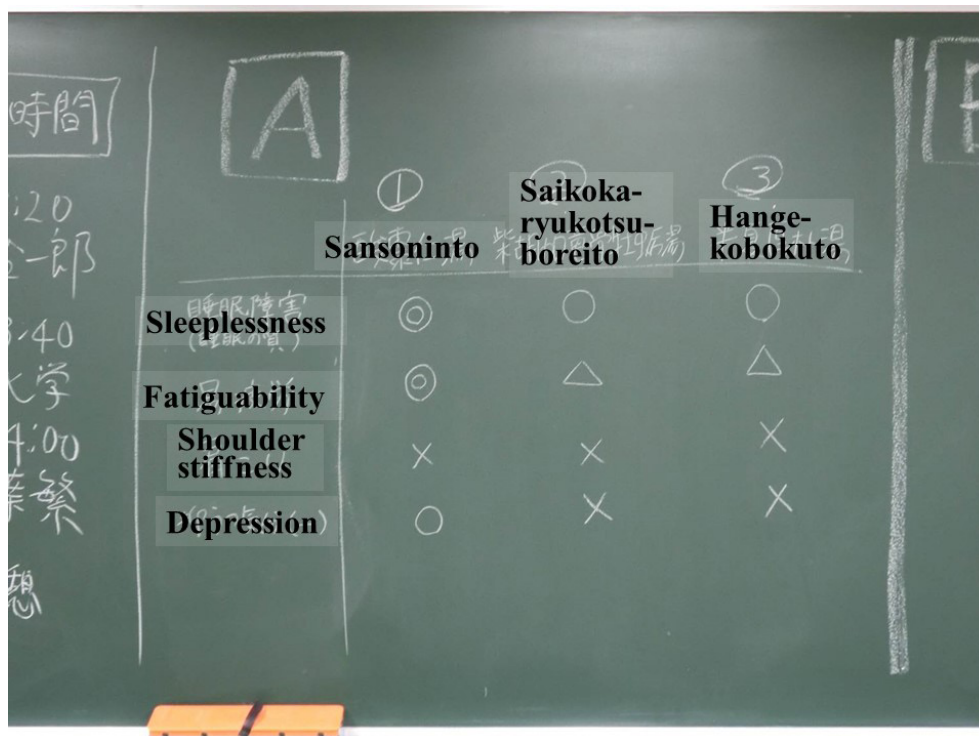
	Orengedokuto (黄連解毒湯)	Chotosan (釣藤散)	Ryokeijutsukanto (苓桂朮甘湯)
1. Headache (not early morning)	○	△	○
2. Hot flush	◎	△	○
3. Hypertension	△	△	×
4. Excess pattern	○	×	×
5. Epigastric distention	○	×	×
6. Vertigo (–) and/or dizziness (–)	○	△	×

**Fig. 3** SP (signs and symptoms-prescription) matching table

Elected Kampo prescriptions are written at the top of each column and the patient's signs and symptoms are written at the left of each line.

Then probabilities of indication are written using two concentric circles, circles, triangle and cross.

Finally, the most suitable prescription is determined by comparing the numbers of the circles.

**Fig. 4** A sample picture of a blackboard used in a TBL class

Students are allocated to small groups and examined simulated patients to identify some Kampo medical problems with a focus on the patient's chief complaints.

## LIMITATIONS

As limitations, there is still no global standard in Kampo education; this current method needs more sophistication with repeated applications in TBL classes. Essential information for choosing Kampo formulae are predominantly gained from medical interviews and visual inspections in this method, although traditional diagnostic procedures are critical in Kampo medicine. Therefore, this method was developed for absolute novices. We expect that it is better for them to study more after becoming more interested in Kampo theories.

## CONCLUSIONS

A new Kampo education method to go along with clinical reasoning was developed that unites the common traditional Japanese theory in clinical reasoning with Western medicine. Accordingly, it is easier for students and residents who study Western medicine, and it raised novices' confidence in making correct Kampo diagnoses.

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## CONFLICT OF INTEREST

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