its SP training program in 2004, and a total of 117 simulated patients have undergone training on this program since its inception. Those SPs who have taken part in all eight programs since 2004 received a certificate of completion from the President of NMS, an ID card, and an SP badge. They have greatly contributed to the interview training courses, OSCE, Advanced OSCE[6] (**Fig. 4**), and other SP-participatory classes. NMS has created an original set of guidelines for SPs working here, spelling out the rules they must follow and making them aware of human rights issues (**Table 1**). The SP training program covers a variety of topics, including the importance of SP participation itself, communication skills, system reviews, feedback techniques during medical examinations, and interviewing skills through role-playing (**Fig. 5**). At the same time, follow-up programs dealing with symptoms such as headache and dyspnea are available to SPs. A series of 10 SP-participatory classes are held, and students have given high marks in their evaluations of classes dealing with "learning from symptoms" such as chest pain and headache, given by various departments, and "thinking about overall symptoms" such as pediatric fever and lower abdominal pain, given by specialists.

3. Practical Medical English Taught by Native English-speaking Doctors

NMS places great weight on medical English acquisition, which has become more important along with the globalization of healthcare. The first- and fourth-year students take TOEFL-ITP to assess their basic English competency. These students also participate in basic medical communication training to improve their level of English competency (**Fig. 6**). Foreign SPs trained by NMS faculty and physicians working at US military hospitals or the British Embassy have been actively participating in these communication training sessions[7]. In addition, for fifth- and sixth-year students and residents, Dr. David Gremillion, the clinical training program director at Kameda Medical Center and Professor at the University of North Carolina, leads five attending rounds annually (**Fig. 7**).

4. Motivating Students Through Early Exposure to Clinical Medicine

Early exposure to clinical medicine has become a common feature of educational programs at Japanese medical schools in recent years. At NMS, a 1-week clinical nursing practice program called "Medical Student Internship" (MSI) has been part of the first-year program since 2007.

The 100 first-year students are divided into teams of 5, each under the guidance of a physician, and they assist ward nurses in taking care of patients. The program starts with an orientation and ends with a general feedback session, between which a wide range of training in basic patient care is offered: room management (changing sheets and making beds); activity and rest (aiding patients to walk, pushing wheelchairs, moving stretchers, moving patients into different body positions, and joint mobility training); washing and dressing patients (body washing in foot/hand baths, hair washing, dressing/undressing, basic oral care, and bathing assistance); wound care and management, and ulcer management); and general ward responsibilities (transfer of specimens and order forms, room cleaning, and patient guidance and transfer) (**Fig. 8, 9**). The average overall evaluation scores for the program last year (maximum score: 10 points) were 7.6 points (as evaluated by the students), 6.5 points (given by the nurses), 7.1 points (by the physicians), and 8.1 points (the patients' families), demonstrating a high satisfaction rate among the first-year students.

MSI promotes student understanding of the physical and psychological pain of patients and their families along with a greater appreciation of the responsibilities shouldered by healthcare professionals. Furthermore, MSI fosters in students a sprit of social service and helps them develop a secure psychological foundation for their future careers.

5. Novel Medical Science Program

As part of the ongoing curricular changes being implemented at NMS, a new course entitled Novel Medical Science has been added to the first-year curriculum to fulfill the perceived need for entering

Fig. 7 Dr. Gremillion's attending rounds in English

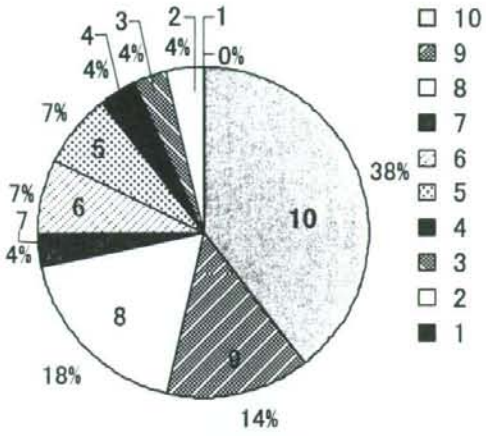
Fig. 9 Early clinical exposure with an expert nurse

Fig. 8 Medical Student Internship
Early clinical exposure with a nurse and professor

Fig. 10 Hideyo Noguchi enrolls in Saisei Gakusha Preparatory School (reproduced with the kind permission of The Hideyo Noguchi Memorial Association)

students to be given an overview of the programs spanning their six years of medical education. The program includes introductions to: 1) the basic philosophy underlying the school's educational programs; 2) the new examination and evaluation systems; 3) the importance of basic medicine based on the model core curriculum; 4) medical ethics and the concept of the ideal physician; 5) the use of simulators to learn basic clinical skills, and the importance of communication skills in clinical settings; and 6) the importance of English skills in the age of medical globalization. In addition, a special lecture on the lessons that can be learned from Dr. Hideyo Noguchi (**Fig. 10**) is offered, along with training courses in Basic Life Support (BLS) and the use of automated external defibrillators (AED), which are prerequisites for medical students.

This year, the special lecture on Dr. Hideyo Noguchi (entitled "Learn from Hideyo Noguchi") was given by Dr. Nobuyasu Karasawa, a graduate of NMS and a council member of the Japan Society of Medical History. Dr. Hideyo Noguchi graduated from Saisei Gakusha, the forerunner of NMS, and Dr. Karasawa described how Noguchi and other eminent graduates exemplified the school's fundamental goal of nurturing selfless doctors who



Overall student evaluations (10: best, 1: worst)

Fig. 11 Student evaluations of the Novel Medical Science special lecture (Global score average=8.0)

would not only strive to save patients' lives but also to make significant contributions to society and medicine. One of the authors (Shimura) followed this up with a talk on the textbooks and evaluation systems used at Saisei Gakusha, and the school's strict rules and high educational standards[8]. Dr. Hisashi Ohkuni, an emeritus professor of biological immunity, then talked about Noguchi's work in the US and the challenges he faced in a foreign country.

The first-year students' parents were also invited to this lecture, and many of them attended. The overall assessment of the lecture was high (global score: 8.0), particularly among the students (**Fig. 11**). It can reasonably be claimed that the lecture motivated the students by making them aware of NMS's proud history of more than 130 years.

Concluding Remarks

The new and unique programs designed by NMS's Academic Quality and Development Office represent a significant step forward in the school's provision of medical education. To achieve the specific goals of these programs, the close collaboration and support of all faculty members are essential. In line with our proud academic and educational philosophy, all faculty members are asked to continue to devote their best efforts to educate our students, the school's greatest resources.

Other academic matters not covered in this article are described in the annual Nippon Medical School Education Promotion Report, which is accessible online through the school's website: http://www.nms.ac.jp/suishin/.

References

1. Kozu T: Medical Education in Japan. Academic Medicine 2006; 81: 1069–1075.
2. Shimura T: T/Each other Medical Programs beyond the year grade and the department ~Simulated Patients and Their Roles in Medical Education~. Medical Education (Japan) 2007; 38: 328.
3. Shimura T, Aramaki T, Shimizu K, Miyashita T, Adachi K, Teramoto A: Implementation of Integrated Medical Curriculum in Japanese Medical Schools. J Nippon Med Sch 2004; 71: 11–16.
4. Yoshimura A, Shimura T, Aso R, et al.: Investigation of the reliability of teaching evaluation by medical students. Medical Education (Japan) 2007; 38: 377–381.
5. Shimura T, Yoshimura A, Igarashi T, Ishikawa G: Childbed, neonatal, and infancy simulation in the curriculum of medical education. Pediatrics of Japan 2008; 49: 1259–1270.
6. Aso R, Yoshimura A, Shimura T, et al.: Special Training Course for Simulated Patients Who Participated in the Advanced OSCE at Nippon Medical School. J Nippon Med Sch 2008; 75: 46–47.
7. Saito T, Takayanagi K, Shimura T: English SP training program for the medical interview course at a Japanese medical school. Medical Education (Japan) 2007; 38: 20.
8. Shimura T, Karasawa N, Ishikawa K, Teramoto A: Report on the Photography and Examination Questions which Toetsu Ishikawa, Who Was Hideyo Noguchi's Classmate, Left at the Time of the Saisei-Gakusha Medical School. J Jpn Soc Med Hist 2006; 52: 82.

(Received, June 13, 2008)
(Accepted, July 8, 2008)

ORIGINAL REPORTS

Can Interview Prior to Laparoscopic Simulator Training Predict a Trainee's Skills?

Tsutomu Nomura, MD, Masao Miyashita, MD,* Suman Shrestha, MD,† Hiroshi Makino, MD,* Yoshiharu Nakamura, MD,* Ryouko Aso, MD,‡ Akinobu Yoshimura, MD,‡ Toshiro Shimura, MD,‡ Shigeo Akira, MD,§ and Takashi Tajiri, MD**

*Department of Surgery, Nippon Medical School, Tokyo, Japan; †Department of Surgery, Kathmandu Medical College, Tokyo, Japan; and ‡Academic Quality and Development Office and §Department of Obstetrics and Gynecology, Nippon Medical School, Tokyo, Japan

BACKGROUND: Our institute started laparoscopic simulator training for medical students in 2006. During the training, we observed considerable interindividual differences in laparoscopic skills among those students. This study aimed to investigate the predictive factors that affect laparoscopic skill by assessing the students' training results data.

METHODS: Forty-three, fifth-year medical students were asked several questions and were divided into 2 groups depending on their answers. The participants performed an object-positioning module on a ProMIS simulator (Haptica, Inc., Dublin, Ireland). Execution time, instrument path length, and economy of movement for each trial were recorded on ProMIS. Comparisons of mean performance measures between the 2 groups were made using a Mann-Whitney U test.

RESULTS: Interest about laparoscopic surgery and accomplishment in playing piano did not affect the skillfulness significantly. The students who had an interest in television (TV) games completed the task in less time ($p = 0.046$) and had a shorter left instrument path length ($p = 0.012$). The students who thought themselves manually dexterous completed the task in less time ($p = 0.008$). The students who were confident about driving completed the task in less time ($p = 0.0247$).

DISCUSSION: In our interview, the factors that had a relationship to laparoscopic skills were favorableness to TV games, manual dexterity, and confidence about driving. These results were expected because TV games and driving a car require the same abilities as laparoscopic surgery. Psychomotor, perceptual, or visuospatial ability are essential for good performance. In conclusion, our study suggests that the interview can be an effective measure to examine the aptitude of medical students without the use of a simulator. (J Surg 65:335-339. © 2008 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: augmented reality simulator, laparoscopic skill, surgical education, competencies

COMPETENCY: Interpersonal and Communication Skills, Practice Based Learning and Improvement, Systems Based Practice

INTRODUCTION

A change in the medical social climate affects the relationship between doctors and patients. Surgical treatments sometimes involve a high risk and may have unexpected outcomes. Patients will not accept the risk of unforeseen outcomes if the results are caused by a lack of the surgeon's experience. The explosive increase in laparoscopic surgery has led to many problems caused by unskilled surgeons, and therefore, the necessity of laparoscopic surgery training is argued for by leading laparoscopic surgeons.

Virtual reality (VR) simulators are used for skills training in many fields, for example, driving cars or piloting air or spacecraft. Virtual reality simulators for laparoscopic surgery were first introduced in the mid-1990s,[1] and they are now widely used in the education of young surgeons because training through actual operations is no longer allowed.

The usefulness of VR simulators was reported from the perspective of training and laparoscopic skill assessment.[2-5] Training outside the operating room is essential to improve intraoperative performance and will ultimately translate into better care of patients. An assessment of laparoscopic skills using VR simulators distinguishes accurately between laparoscopic experts and novices,[6,7] and it enables the assistance of their skills improvement by objectively pointing out their skill defects.

Our institute introduced 2 types of simulators for laparoscopic surgery in 2006, which are Lapsim (Surgical ScienceAB, Göteborg, Sweden) and ProMIS (Haptica, Inc., Dublin, Ire-

Correspondence: Inquiries to Tsutomu Nomura, MD, Department of Surgery, Nippon Medical School, 1-1-5 Sendagi, Bunkyo-ku, Tokyo 113-8603, Japan; fax: 03-5685-0989; e-mail: nomura-t@nms.ac.jp

land), and started laparoscopic training for medical students. The aims of the training were to promote a new educational method that fits societal needs and to make the medical students interested in laparoscopic surgery. During the training, we noticed that considerable interindividual differences were observed in laparoscopic skills among those students. Our study aimed to investigate the predictive factors that affect the laparoscopic skill by assessing the students' training results data.

METHODS

Forty-three, fifth-year medical students (men: 27, women: 16, mean age: 24.5 years) from Nippon Medical School with no previous experience of laparoscopic surgery or simulation training participated in the study. Prior to the training, the participants were asked several questions (Table 1). Participants were divided into 2 groups depending on their answers about their interest in laparoscopic surgery, willingness to play TV games, confidence about driving, accomplishment at playing the piano, and cleverness with their hands. The participants performed an object-positioning module on the ProMIS simulator. Execution time, instrument path length, and economy of movement for each trial were recorded on ProMIS . Comparisons of mean performance measures between the 2 groups were made using a Mann-Whitney U test.

Apparatus

The ProMIS, augmented reality (AR) simulator introduced in our institute is used for the training and laparoscopic skill assessment. It is based on a Dell portable notebook computer (Dell, Inc., Round Rock, Texas) with a 2.80-GHz Intel Pentium 4 processor running Windows XP Home Edition (Microsoft, Inc., Redmond, Washington) with 512-MB RAM and a 30-GB hard drive. The laparoscopic interface consists of a torso-shaped metallic mannequin, 29" L × 20" W × 9" D, with a yellow neoprene cover connected to the computer with a standard 4-pin 1394 IEEE digital cable. The mannequin contains 3 separate camera tracking systems to capture instrument motion with Cartesian coordinates in the x, y, and z axis. Tasks in the system can be performed using actual laparoscopic surgical instruments. The distal end of a laparoscopic instrument shaft is covered with 2 pieces of yellow electrical tape to serve as a reference point for the camera tracking systems. Precise measures of time, instrument path length, and smoothness of movement—as detected by changes in instrument velocity—are recorded for each instrument (right and left hand) during each simulated task.

TABLE 1. Questionnaire Before the Training

ID Number:	Name:	Age:	Gender:
Belonging to a club in college:			
Please answer the following questions and circle (1) yes or (2) no;			
☐ Have you ever experienced surgical training?			(1) yes, (2) no
☐ Do you want to try a laparoscopic simulator?			(1) yes, (2) no
☐ Do you have an interest in laparoscopic surgery?			(1) yes, (2) no
☐ Do you like TV games? (What kind of TV games do you like?)			(1) yes, (2) no
☐ Do you have confidence in your driving?			(1) yes, (2) no
☐ Can you play the piano?			(1) yes, (2) no
☐ Are you clever with your hands?			(1) yes, (2) no

TABLE 2. Answers to the Questions

Questions	Yes	No
☐ Have you ever experienced surgical training?	0	43
☐ Do you want to try a laparoscopic simulator?	43	0
☐ Do you have an interest in laparoscopic surgery?	28	15
☐ Do you like TV games?	28	15
☐ Do you have confidence in your driving?	20	23
☐ Can you play the piano?	21	22
☐ Are you clever with your hands?	26	17

Module: Object Positioning

The simulator has 5 bins in this module, each with a different height and depth. Each bin contained 1 bead that measured 0.5 × 0.5 cm, which had to be placed in other bins in accordance with the instructions of the computer. This task had to be performed using both hands equally (Table 2).

RESULTS

All participants completed the module. Objective assessment of the data is presented in Tables 3–7. Their interest about laparoscopic surgery and accomplishment in playing the piano did not affect the skillfulness significantly in any of the 3 assessment measures of the simulator. However, the students who had an interest in TV games completed the task in less time (177.8 ± 35.4 vs 196.9 ± 48.3 s, $p = 0.046$) (Fig. 1) and had a shorter left instrument path length (3618.5 ± 1049.6 mm vs 4261.3 ± 1146.4 mm, $p = 0.012$) (Fig. 2). The students who were confident about driving completed the task in less time (179.9 ± 41.0 vs 205.7 ± 60.2 seconds, $p = 0.0247$) (Fig. 3). The students who thought themselves manually dexterous completed the task in less time (177.8 ± 33.9 vs 204.2 ± 53.6 seconds, $p = 0.008$) (Fig. 4).

DISCUSSION

It was impossible in many institutes to exercise and assess laparoscopic skills without performing an actual operation on patients before the VR simulator was introduced. Therefore, it has

TABLE 3. A Comparison Between Students Who Have No Interest on Surgery and Those Who Have an Interest in Surgery

	NI Group (n = 15)	I Group (n = 28)	p Value
Total time	195.0 ± 65.8	193.0 ± 45.9	NS
Left instrument path (mm)	4000.0 ± 1265.5	4078.1 ± 1264.4	NS
Left instrument economy of movement	962.0 ± 406.8	997.7 ± 393.6	NS
Right instrument path (mm)	3949.0 ± 1855.8	3985.2 ± 1729.1	NS
Right instrument economy of movement	750.9 ± 378.4	813.7 ± 295.0	NS

NI group = students who have no interest in surgery; I group = students who have an interest in surgery.
Values represent mean ± standard deviation.

TABLE 4. A Comparison Between Students Who Like TV Games and Those Who Do Not Like TV Games

	TVF Group (n = 28)	TVN Group (n = 15)	p Value
Total time	177.8 ± 35.4	196.9 ± 48.3	0.046
Left instrument path (mm)	3618.5 ± 1049.6	4261.3 ± 1146.4	0.012
Left instrument economy of movement	873.1 ± 314.9	1005.2 ± 383.4	NS
Right instrument path (mm)	3470.5 ± 1193.5	4103.8 ± 1790.0	NS
Right instrument economy of movement	696.6 ± 277.9	800.8 ± 355.4	NS

TVF group = students who like TV games; TVN group = students who do not like TV games.
Values represent mean ± standard deviation.

TABLE 5. A Comparison Between Students Who Have Confidence in Their Driving and Those Who Do Not Have Confidence in Their Driving

	C Group (n = 20)	N Group (n = 23)	p Value
Total time	179.9 ± 41.0	205.7 ± 60.2	0.0247
Left instrument path (mm)	3874.1 ± 1304.9	4160.3 ± 1214.7	NS
Left instrument economy of movement	894.7 ± 364.9	1043.8 ± 420.3	NS
Right instrument path (mm)	3867.1 ± 1773.1	3922.1 ± 1595.5	NS
Right instrument economy of movement	727.9 ± 332.9	811.8 ± 365.2	NS

C group = students who have confidence in their driving; N group = students who do not have confidence in their driving.
Values represent mean ± standard deviation.

TABLE 6. A Comparison Between Students Who Have Experience Playing The Piano and Those Who Have No Experience Playing the Piano

	PE Group (n = 21)	PN Group (n = 22)	p Value
Total time	197.8 ± 56.2	189.8 ± 50.7	NS
Left instrument path (mm)	3939.9 ± 1132.5	4110.6 ± 1375.4	NS
Left instrument economy of movement	982.4 ± 404.8	966.8 ± 400.4	NS
Right instrument path (mm)	3686.0 ± 1447.4	4288.3 ± 1788.2	NS
Right instrument economy of movement	714.6 ± 330.4	828.3 ± 364.8	NS

PE group = students who have experience of playing the piano; PN group = students who have no experience of playing the piano.
Values represent mean ± standard deviation.

TABLE 7. A Comparison Between Students Who Think Themselves Clever with Their Hands and Those Who Do Not Think Themselves Clever with Their Hands

	CH Group (n = 26)	NH Group (n = 17)	p Value
Total time	177.8 ± 33.9	204.2 ± 53.6	0.008
Left instrument path (mm)	3807.7 ± 1059.8	4133.9 ± 1383.1	NS
Left instrument economy of movement	881.4 ± 287.1	1024.5 ± 456.1	NS
Right instrument path (mm)	3618.1 ± 1438.3	4110.4 ± 1826.8	NS
Right instrument economy of movement	699.3 ± 287.4	834.0 ± 382.8	NS

CH group = students who think themselves clever with their hands; NH group = students who do not think themselves clever with their hands.
Values represent mean ± standard deviation.

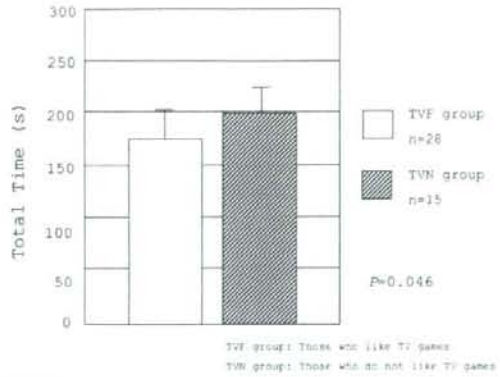


FIGURE 1. A comparison of the total time between students who like TV games and those who do not like TV games.

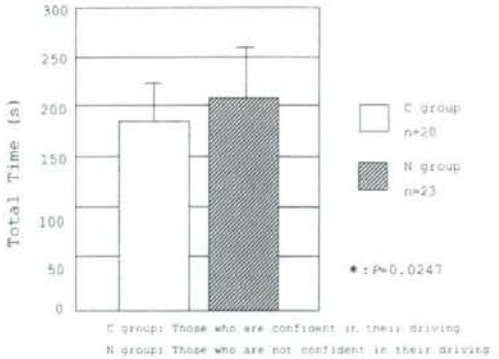


FIGURE 3. A comparison of total time between students who have confidence in their driving and those who do not have confidence in their driving.

not commonly been possible for medical students to test their aptitude at laparoscopic surgery before becoming doctors. Accordingly, they have been forced to decide their career planning for a medical specialty without understanding whether they have an aptitude for laparoscopic surgery.

Laparoscopic training using the VR simulator involves no risk of injuring the patients; therefore, it can be easily introduced for the education of medical students. However, to investigate the improvement of laparoscopic skill after training, medical students are suitable subjects because they have no prior experience of performing operations and are fresh to laparoscopic surgery. Furthermore, they have sufficient time to exercise using VR simulators compared with busy surgeons. Accordingly, many reports describe the efficacy of VR simulator training performed by volunteer medical students.[8-12]

In our educational trial, we made the medical students operate an AR simulator and assessed their laparoscopic skills. Botden et al[13] reported that the ProMIS AR laparoscopic simulator is regarded as a better tool for training surgical residents than the LapSim VR laparoscopic simulator on the limited number of tasks tested, because AR offers better realism, haptic feedback, didactic value, and construct validity than does VR, and it also gives useful feedback to determine trainee skill levels.[13]

The data showed that considerable interindividual differences were found among the medical students in laparoscopic skills. We investigated their characters by interviewing before the training to find out factors that might affect the results. In our interview, the factors that had relationship to laparoscopic skills were a keenness for TV games, manual dexterity, and confidence about driving. These results were expected because TV games and driving require the same abilities as laparoscopic surgery. Psychomotor, perceptual, or visuospatial ability are essential for good performance. Rosser et al[14] reported that video game skills are correlated with laparoscopic surgical skills and might be a practical teaching tool to help train surgeons.

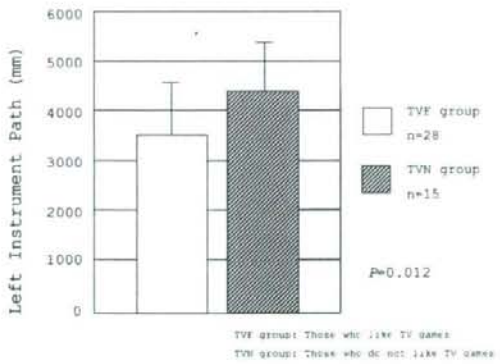


FIGURE 2. A comparison of the left instrument path between students who like TV games and those who do not like TV games.

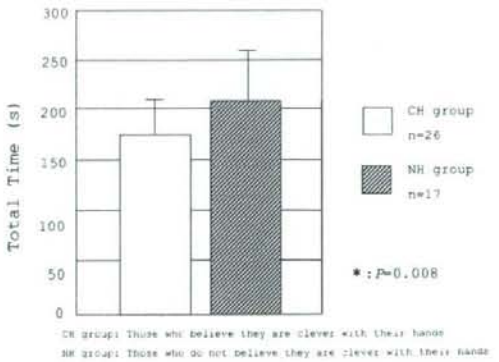


FIGURE 4. A comparison of the total time between students who think themselves clever with their hands and those who do not think themselves clever with their hands.

Although manual dexterity and confidence in car driving are subjective factors scored by the self-assessment of medical students, they had significant relations to laparoscopic skill in our study. More accurate assessment might be performed if all the students were tested about these factors, but because it is impossible realistically, we performed the interview to save labor.

Our study suggested that several interview results before training can predict the laparoscopic skills of trainees in an AR simulator, but it did not insist that we can predict the laparoscopic talent of medical students completely with this assessment. To predict a surgical trainee's talent in laparoscopic surgery, investigation of the performance curves during a series of repetitive trials is required.[15] Stefanidis et al[16] reported that psychomotor testing can predict the rapidity of laparoscopic skill acquisition. In conclusion, ideally every medical student should be given the chance to experience a simulator; however, it is too expensive to introduce in all medical schools. Our study suggests that the interview can be an effective measure to examine the aptitude of medical students without using a simulator. Accordingly, the interview should be useful for students with no access to a simulator to discover whether they have an aptitude for laparoscopic surgery. Moreover, the information gained from this study should stimulate the motivation of students if using the AR simulator shows them that they probably have laparoscopic skills.

REFERENCES

1. Dunkin B, Adrales GL, Apelgren K, et al. Surgical simulation. *Surg Endosc*. 2007;21:357-366.
2. Aggarwal R, Grantcharov TP, Eriksen JR, et al. An evidence-based virtual reality training program for novice laparoscopic surgeon. *Ann Surg*. 2006;244:310-314.
3. Villegas L, Schneider BE, Callery MP, et al. Laparoscopic skills training. *Surg Endosc*. 2003;17:1879-1888.
4. Aggarwal R, Moorthy K, Darzi A. Laparoscopic skills training and assessment. *Br J Surg*. 2004;91:1549-1558.
5. Aggarwal R, Grantcharov TP, Eriksen JR, et al. An evidence-based virtual reality training program for novice laparoscopic surgeons. *Ann Surg*. 2006;244:310-314.
6. Van Dongen KW, Tournoij E, Van der Zee DC, et al. Construct validity of the LapSim: can the LapSim virtual reality simulator distinguish between novices and experts? *Surg Endosc*. 2007;21:1413-1417.
7. Duffy AJ, Hogle NJ, McCarthy H, et al. Construct validity for the LAPSIM laparoscopic surgical simulator. *Surg Endosc*. 2005;19:401-405.
8. Hogle NJ, Briggs WM, Fowler DL, et al. Documenting a learning curve and test-retest reliability of two tasks on a virtual reality training simulator in laparoscopic surgery. *J Surg Educ*. 2007;64:424-430.
9. Stefanidis D, Korndorffer JR, Heniford BT, et al. Limited feedback and video tutorials optimize learning and resource utilization during laparoscopic simulator training. *Surgery*. 2007;142:202-206.
10. Munz Y, Almoudaris AM, Moorthy K, et al. Curriculum-based solo virtual reality training for laparoscopic intracorporeal knot tying: objective assessment of the transfer of skill from virtual reality to reality. *Am J Surg*. 2007;193:774-783.
11. Ganai S, Donroe JA, St. Louis MR, et al. Virtual-reality training improves angled telescope skills in novice laparoscopists. *Am J Surg*. 2007;193:260-265.
12. Hart R, Doherty DA, Karthigasu K, et al. The value of virtual reality-simulator training in the development of laparoscopic surgical skills. *J Minim Invasive Gynecol*. 2006;13:126-133.
13. Botden SM, Buzink SN, Schijven MP, et al. Augmented versus virtual reality laparoscopic simulation: what is the difference? A comparison of the ProMIS augmented reality laparoscopic simulator versus LapSim virtual reality laparoscopic simulator. *World J Surg*. 2007;31:764-772.
14. Rosser JC, Lynch PJ, Cuddihy L, et al. The impact of video games on training surgeons in the 21st century. *Arch Surg*. 2007;142:181-186.
15. Rosenthal1 R, Gantert1 WA, Scheidegger D, et al. Can skills assessment on a virtual reality trainer predict a surgical trainee's talent in laparoscopic surgery? *Surg Endosc*. 2006;20:1286-1290.
16. Stefanidis D, Korndorffer JR, Black FW, et al. Psychomotor testing predicts rate of skill acquisition for proficiency-based laparoscopic skills training. *Surgery*. 2006;140:252-262.

Abstracts of Outstanding Presentations of the 76th Annual Meeting of the Medical Association of Nippon Medical School

Date: September 6, 2008 Place: Nippon Medical School

Abstracts of Outstanding Presentation (1)

A Training Session in a Clinical Simulation Laboratory for the Acquisition of Clinical Skills by Newly-Recruited Medical Interns

Akinobu Yoshimura[1-3], Toshiro Shimura[1-3], Ryoko Aso[1,2], Koji Adachi[2], Toru Kim[2], Taisuke Morimoto[2], Shigeo Akira[4], Takashi Nitta[4], Masako Takaoka[5], Noriko Takehara[5] and Yuriko Hayasaka[5]

[1]Academic Quality and Development Office, Nippon Medical School
[2]Working Committee of Clinical Simulation Laboratory, Nippon Medical School
[3]Board of Education, Nippon Medical School
[4]Management Committee of Medical Interns, Nippon Medical School Main Hospital
[5]Nursing Department, Nippon Medical School Main Hospital

Introduction

The Nippon Medical School main hospital now manages the transition from medical student to intern with organized orientation programs. In these programs, the working committee of the clinical simulation laboratory introduced a training session, which was designed to improve the clinical skills of newly recruited medical interns. We present the technique that was used to provide this effective clinical skills training and the results of a questionnaire survey aimed at assessing the value the interns placed on the program.

Subjects and Methods

In April 2008, as part of the organized orientation programs, a training session for clinical skills was implemented using a clinical simulation laboratory and 3 small-group learning (SGL) rooms. The aim of the session was to train medical interns in basic clinical skills. Beforehand, all interns were required to read the training manual, in which the procedures of each training course were described and the specific behavioral objectives were clearly defined. The session consisted of 6 training courses, including an internal examination, tracheal intubation, auscultation (heart sounds and lung sounds) and the collection of a venous and arterial blood samples. Medical interns moved in rotation every 30 minutes and participated in the practical trainings in each room (**Fig. 1**). At the end of the training session, the interns were required to complete a questionnaire survey in which they answered 5 questions using a 4-point scale (1=poor, 4=good).

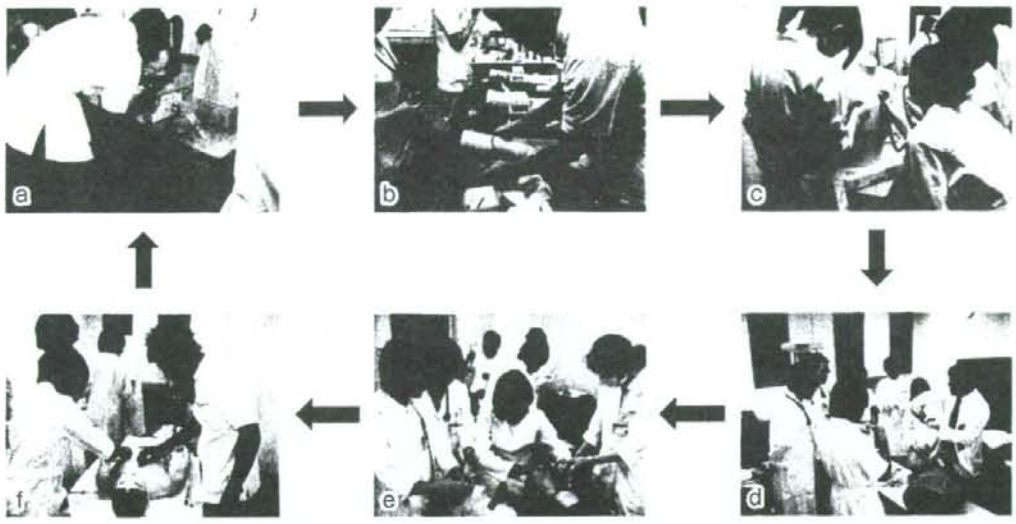


Fig. 1 Appearance of Training Session for Clinical Skill
Medical interns moved in rotation every 30 minutes and took practical trainings in each room.
a. collection of arterial blood sample, **b**. collection of venous blood sample, **c**. auscultation (lung sounds), **d**. internal examination, **e**. tracheal intubation, **f**. auscultation (heart sounds).

The 5 items in the questionnaire were as follows: Q1: "Were the instructions comprehensible?" (ie, comprehensibility of the instructions); Q2: "Were the descriptions in the manual comprehensible?" (ie, comprehensibility of the manual); Q3: "To what extent did you acquire clinical skills?" (ie, acquisition of clinical skills); Q4: "To what extent were you satisfied with the session?" (ie, satisfaction with the session); and Q5: "Will you use the clinical simulation laboratory for self-training?" (ie, utilization of clinical simulation laboratory).

Results

A total of 37 newly recruited medical interns participated in the session, which was efficiently carried out from a standpoint of both human resources and teaching hours. Eight physicians and 2 nurses were required as instructors. The session lasted for 3 hours 30 minutes and consisted of 3-hours of training plus 15-minutes of orientation and a rest period each. In total, 89% (33 of 37) of interns completed the questionnaire survey provided at the end of the training. Most of interns considered the explanations given by the instructors and the descriptions in the manual to be easily understandable **(Fig. 2)**. Although only 12% (4 of 33) of interns thought that they had successfully acquired clinical skills, 67% (22 of 33) were satisfied with the session **(Fig. 2)**.

Discussion

Teaching programs to promote clinical skills are attractive to medical interns. The importance of intern education as a component of risk management may be sufficient reason for health-service providers to continue to support intern education. Therefore, one might assume that initial clinical skills training for medical interns in the early stages of their internship would be of great benefit, both from the viewpoint of their motivation, as well as that of risk management. The session was efficiently carried out from a standpoint of both human resources and the teaching hours involved and, therefore, can be considered to contribute to the reduction of the overall teaching burden of instructors. The questionnaire survey revealed that the interns rated the session as high, in terms of the content of the training and the skills they had acquired.

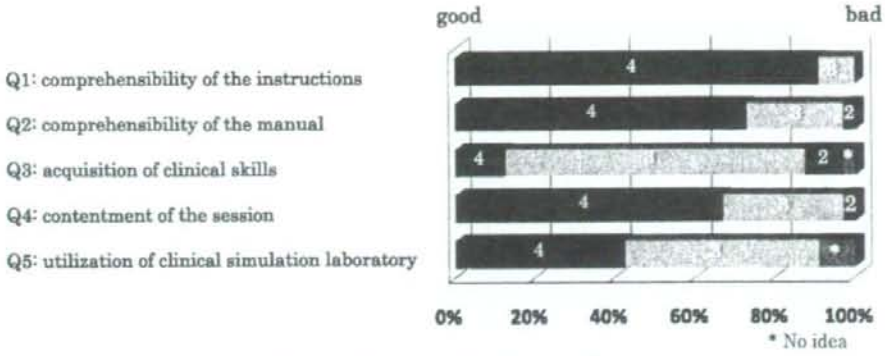


Fig. 2 Result of the Questionnaire Survey

Medical interns must continually engage in self-training to steadily acquire basic clinical skills. The convenience of a clinical simulation laboratory, together with the reinforcement of the education of clinical skills during internship, is necessary to strengthen the educational benefits of the training session.

Abstracts of Outstanding Presentations of the 75th Annual Meeting of the Medical Association of Nippon Medical School

Date: September 1, 2007 Place: Nippon Medical School

Abstract of Outstanding Presentation (1)

Special Training Course for Simulated Patients Who Participated in the Advanced OSCE at Nippon Medical School

Ryoko Aso[1], Akinobu Yoshimura[1], Toshiro Shimura[1], Kazue Takayanagi[2], Yasuhiko Iino[3], Yoshinori Kobayashi[3], Yoshihiko Seino[3] and Hiroto Hidaka[4]

[1]Academic Quality and Development Office, Nippon Medical School
[2]Department of Health Service Administration, Nippon Medical School
[3]Internal Medicine, Nippon Medical School
[4]Committee for the Recruitment and Training of Simulated Patients, Nippon Medical School

Introduction

When bedside learning is completed, sixth-year medical students at our medical school take the Advanced Objective Structured Clinical Examination (OSCE). However, the Advanced OSCE is mandatory for students at only a few medical schools in Japan. We first administered the Advanced OSCE in 2005, and this examination became mandatory for sixth-year students at Nippon Medical School in 2007 (**Table 1**).

Features of our school's Advanced OSCE are as follows. 1) The Advanced OSCE became mandatory for all sixth-year medical students in 2007; 2) original clinical scenarios developed at our medical school were used; and 3) the simulated patients (SPs) trained at our school participated in the Advanced OSCE. To successfully administer the Advanced OSCE, training the SPs is of utmost importance. We report on the 3-day special training course provided to the SPs.

Table 1 Medical students who took the Advanced OSCE

Year	Number of students
2005	12 volunteer 6th-year students
2006	9 volunteer 6th-year students and 8 volunteer 5th-year students
2007	Mandatory, 97 6th-year students

Journal Website (http://www.nms.ac.jp/jnms/)

Fig. 1 Emergency station
The simulated patient, who was wearing makeup to mimic cyanosis, groaned with respiratory distress. A student started to resuscitate the mannequin.

Table 2 Special training course for SPs prior to the Advanced OSCE in 2007

Date	Training
May 9, 2007	SP instructors provided explanations of the 2 diseases and read through the scenarios with the SPs
May 23, 2007	Medical specialists provided guidance in acting out symptoms (such as dyspnea); SP instructors provided guidance in giving feedback to students
June 13, 2007	An SP instructor who had graduated from an art college provided guidance in applying makeup to mimic cyanosis; medical specialists provided guidance on acting (arrhythmia, etc.).

Materials and Methods

The Advanced OSCE administered at our medical school in 2007 consisted of the Cardiovascular and Emergency stations using clinical scenarios (**Fig. 1**). The 97 sixth-year students were randomly assigned to take the Advanced OSCE at either the Cardiovascular station or the Emergency station. Each student was evaluated in 3 categories on the checklist form by an evaluator: 1) medical interview; 2) physical examination of the SP or the simulator at the Cardiovascular station, or physical examination of the simulator at the Emergency station; and 3) writing the diagnosis, and ordering necessary tests and medications at the Cardiovascular station or treatment of the simulator at the Emergency station. Additionally, the SPs evaluated the students with regard to the medical interview procedure on the checklist form. SPs whose average age was 59.5 with 2 to 3 years' experience as SPs were recruited. Before the Advanced OSCE was administered to the students, we held a training course for the SPs on 3 different days (**Table 2**). In the training course, the SP instructor provided explanations of the 2 diseases and read through the scenarios together with the SPs; medical specialists provided guidance in acting out symptoms (such as dyspnea); and an SP instructor who had graduated from an art college provided guidance on makeup to mimic cyanosis. After the Advanced OSCE, we administered a questionnaire to the SPs in which they were asked to evaluate the training course and to perform a self-evaluation.

Results

By attending the special training course, the SPs felt that they could understand the scenario (mean self-evaluation score of the SPs was 3.8 and 3.9 out of 4, in the Cardiovascular station group and Emergency station group, respectively), could act out the scenario (3.4 and 3.2, respectively), and could give feedback to the students with regard to their behavior and communication skills as a physician (3.2 and 3.3, respectively). The SPs rated this training course highly. Moreover, by using makeup to mimic cyanosis (mean self-evaluation score was 3.7 out of 4 in the Emergency station group), the SPs felt that they could easily play the role of the patient.

Summary

We presented a special training course for our certified SPs who participated in the Advanced OSCE. In the future, we will continue to train SPs and establish a new bidirectional medical education.

THE LUNG
perspectives

VOL.16 NO.2 2008 別刷

株式会社 メディカルレビュー社

呼吸器病学をいかに教育するか
—大学病院—

How should we educate in respiratory medicine ; University hospital

日本医科大学内科学講座呼吸器・感染・腫瘍部門／教育推進室准教授 **吉村 明修** *Akinobu Yoshimura*

Key words
診療参加型臨床実習，新医師臨床研修制度，特定機能病院制度，プライマリ・ケア

Summary

プライマリ・ケアの基本的な診療能力を修得することを目的とした診療参加型臨床実習，新医師臨床研修制度が導入され，医学教育は大きく変化した。一方大学病院は，特定機能病院として位置付けられ，その結果，診療の高度専門化とプライマリ・ケアの修得を目標とする医学教育の間で大きな矛盾を抱えることとなった。この矛盾を解決するために，多くの大学病院で総合診療部の設置，地域での医学教育の導入が行われている。総合診療部については，医学教育の観点から，単に病院における診療の一部でなく，プライマリ・ケアを修得し全人的医療を行う教育部門との位置付けを明確にする必要がある。そして，その充実のためには，今後の各大学の努力が必要と考えられる。

はじめに

ここ数年，わが国の医学教育に大きな改革が行われ，その様相は大きく変化した。平成13年に「21世紀における医学・歯学教育の改善方策について—学部教育の再構築のために—」が策定され，そのなかでモデル・コア・カリキュラムが提示され，臨床能力の向上を目指した診療参加型臨床実習（クリニカル・クラークシップ）の導入が推奨された。平成16年度からは新医師臨床研修制度が開始されるとともに，医師臨床研修マッチングプログラムが導入され，プライマリ・ケアの基本的な診療能力を修得することが，臨床実習，初期研修の目的であることが明示された。一方，平成4年には特定機能病院制度が導入され，ほとんどの大学病院は指定を受け，高度医療の提供などの機能をもつ医療機関として位置付けられた。その結果，高度に専門化した診療と，プライマリ・ケアの修得を目標とする医学教育の間で，大学病院は大きな矛盾を抱えることとなった。

以下に，大学病院における医学教育の現状と問題点について概説する。

I 卒前医学教育の現状

モデル・コア・カリキュラムは，21世紀における医学・医療の担い手となる医学生が身につけるべきコアと

なる基本的学習内容を提示したものである。その背景としては，医学の著しい進歩や，医療を取り巻く社会的変化とニーズの多様化などがあり，これらに対応するために，医学教育の質の向上と一定水準の質の確保，教育内容の多様化，患者とのコミュニケーション，安全性の確保，問題解決能力を修得するための学生主体の学習方法，将来の進路・社会的需要の多様化に対応した選択性カリキュラムの導入などが示された[1]。また，そのなかで臨床実習における診療参加型臨床実習（クリニカル・クラークシップ）の導入が示されている。診療参加型臨床実習の目的は，「学生が診療チームに参加し，その一員として診療業務を分担しながら，医師としての職業的な知識・思考法・技能・態度の基本的な内容を学ぶこと」とされ，卒業時に臨床医としてプライマリ・ケアの基本的な診療能力を実践できる素地を修得することと理解される[1][2]。これは，臨床能力の向上を目指した改革であり，卒前教育における職業教育の導入であるともいえる[3][4]。

なお，診療参加型臨床実習の実施にあたって，実習開始までに到達すべき知識・技能・態度を標準評価するために，平成17年度から共用試験（Computer Based Testing：CBT，Objective Structured Clinical Examination：OSCE）が正式実施されている。

Ⅱ　新医師臨床研修制度の導入

平成16年度から，新医師臨床研修制度が導入された。この制度の基本理念は，「臨床研修は，医師が，医師としての人格を涵養し，将来専門とする分野にかかわらず，医学及び医療の果たすべき社会的役割を認識しつつ，一般的な診療において頻繁に関わる負傷又は疾病に適切に対応できるよう，プライマリ・ケアの基本的な診療能力（態度・技能・知識）を身に付けることのできるものでなければならない」とされた[5]。新制度では，研修医の採用は原則として公募により行われることとなり，医師臨床研修マッチングプログラムが導入された。その結果，従来医科大学・医学部卒業生の70%超が大学病院に在籍していたが，導入以降在籍数は減少し平成19年度では45%となった（図1）[5]。そして，臨床研修の必修化は，教員に研修医指導という責任を負わせることとなり，研修医の減少とともに大学病院における絶対的なマンパワーの不足を招いている。「医学教育の改善・充実に関する調査研究協力者会議（以降，協力者会議）最終報告」でもこの現状を認識し，指導医などに対するサポート体制の充実が謳われている[2]。

平成18年度２年次研修医を対象に実施された調査によると，研修体制などについての満足度に関する調査では，臨床研修病院（n=2,342）の研修医の62.3%が満足していると答えているのに対し，大学病院（n=1,825）では42.9%のみが満足していると答えていた（図2）[5]。その内容は，臨床研修病院においては「職場の雰囲気がよい」（43.0%），「研修に必要な症例・手技の経験は十分」（42.6%）が挙げられているが，大学病院では，「指導医の指導が熱心」（29.0%）が挙げられているものの，改善すべき点として「待遇・処遇が悪い」（24.4%），「雑用が多い」（24.3%），「研修に必要な症例・手技の経験が不十分」（16.3%）などが指摘されている。

研修プログラムについての満足度に関する調査でも，同様の結果であった（図3）[5]。その内容は，臨床研修病院においては「プライマリ・ケアの能力を身につけられる」（41.1%），「複数の科を回って進路を決める参考になる」（29.5%）が挙げられている。大学病院でも「複数の科を回って進路を決める

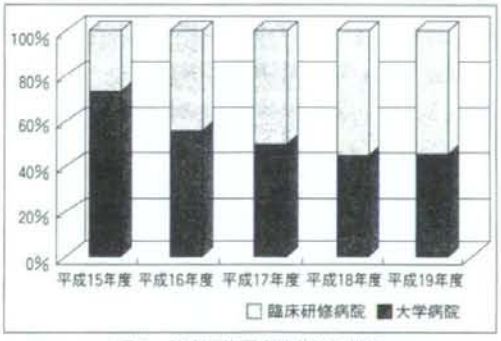


図1．臨床研修医在籍状況の推移
（文献5より引用）

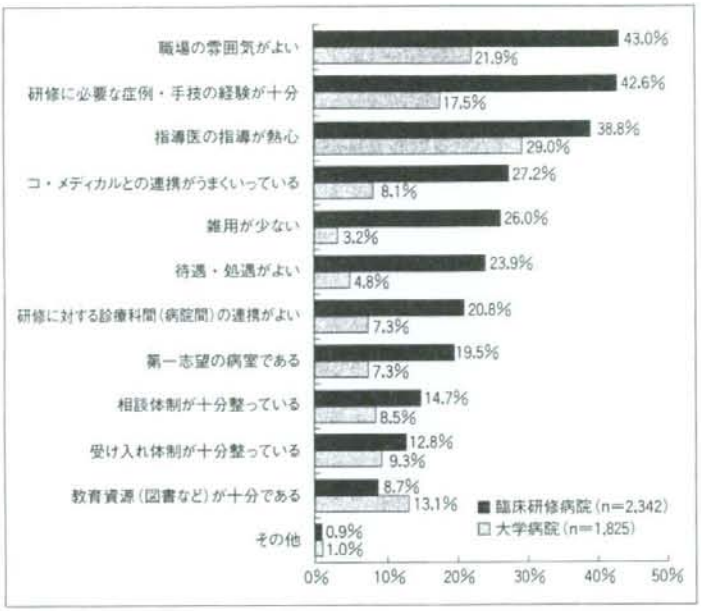


図2．平成18年度2年次研修医調査　研修体制等で満足している点（複数回答）
研修体制等に満足している点としては，臨床研修病院においては「職場の雰囲気がよい」（43.0%），「研修に必要な症例・手技の経験が十分」（42.6%），大学病院においては「指導医の指導が熱心」（29.0%）などが多い。

（文献5より引用）

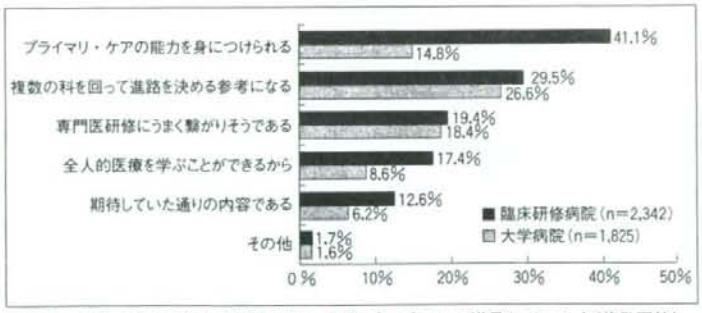


図3．平成18年度2年次研修医調査　研修プログラムで満足している点（複数回答）
研修プログラムで満足している理由は，臨床研修病院においては「プライマリ・ケアの能力を身につけられる」（41.1%），「複数の科を回って進路を決める参考になる」（29.5%），大学病院においては「複数の科を回って進路を決める参考になる」（26.6%）などが多い。

（文献5より引用）

参考になる」（26.6%）が挙げられているものの，改善すべき点として「プライマリ・ケアの能力を身につけられない」（12.8%）などが指摘されている。

なお，臨床分野を希望している研修医3,935人のうち，臨床研修病院（n=2,212）の50.0%，大学病院（n=1,723）の75.2%が，将来大学病院への入局を希望している。合わせると61.0%の研修医が将来大学病院への入局を希望していることになるが，2年間の空白期間を考慮すると，大学病院における医師不足は解消されていない。そして，大学病院における救急医療，産婦人科，小児科などの特定領域の志望者が大幅に減少していることが指摘されている。

Ⅲ　大学病院の変革と医学教育

平成4年の特定機能病院制度の導入により，ほとんどの大学病院は特定機能病院の指定を受け，高度医療の提供とともに，高度医療に関する研究・開発・評価そして研修などを行う機能をもつ医療機関として位置付けられた。そして，高度医療を提供する病院として，他の医療機関から紹介された患者を受け入れることによって，その機能を十分に発揮することが義務付けられており，外来初診患者について「紹介率30%」という目標が設定されている。このことは，大学病院における医療の高度化のみならず専門化，細分化に導くことになり，当然大学病院における疾患分布は変化することが予想される。大学病院における医学教育の問題点として，以下のことが指摘されている[4]。①高度に専門化された医療を扱う医師が重点的に養成されている，

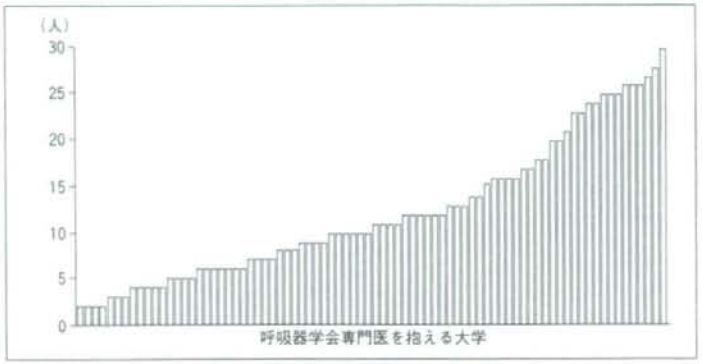


図4．大学別日本呼吸器学会専門医数
所属機関別専門医数を大学別に算出し直したデータであり，必ずしも実態と一致しない可能性がある。

②プライマリ・ケアにおける基本的診療能力の教育が不十分，③地域医療に対応できる能力を身につけることが困難，である。

そもそもプライマリ・ケアの基本概念は「国民の健康や福祉に関わるあらゆる問題を，総合的に解決して行おうとする地域での実践活動のこと」と定義されており，プライマリ・ケアの基本的な診療能力を修得することを目的とする学部教育における臨床実習，初期研修の教育に大学病院はそぐわなくなってきている[6]。また，研修医が初期研修に期待するものがプライマリ・ケアの修得であるなら，大学病院はこの期待に添えないこととなる。このように大学病院では，診療の高度専門化とプライマリ・ケアの修得を目標とする医学教育の間で大きな矛盾を抱えることとなった。

Ⅳ 大学病院の対応

大学病院における医学教育上の，あるいは診療上の矛盾を解決するために，多くの大学病院で総合診療部が設置され，また地域での医学教育(Community-Based Medical Education)の導入が行われている[3]。

総合診療部については，医学教育の観点から，単に病院における診療の一部でなく，プライマリ・ケアを修得し全人的医療を行う教育部門との位置付けを明確にする必要がある。そして，総合診療部が学部における臨床実習，初期臨床研修における教育を担うなら，場当たり的な対応でなく，大学全体の理解と組織の改変を伴った抜本的な改革を要するものと考える。

協力者会議最終報告でも，総合診療方式の導入，卒後臨床研修センターなどによる全体的なコーディネート体制の充実，学外の多様な医療機関との緊密な連携体制の構築などが明記されているが，具体的な実施に関しては，今後の各大学の努力と試行錯誤が必要と考えられる。

おわりに

本稿では，大学病院における医学教育の現状と問題点について概説した。われわれは，呼吸器科医として，医学教育の現状を認識したうえで，大学病院における医学教育に従事していくことが重要であると考える。また，呼吸器病学教育の担い手である日本呼吸器学会専門医数に，地域格差，大学格差(図4)があり，均質な呼吸器病学の教育のためには，これを早急に是正する必要性を強調したい。

文　献

1）医学・歯学教育の在り方に関する調査研究協力者会議報告：21世紀における医学・歯学教育の改善方策について—学部教育の再構築のために—．平成13年3月27日．
2）医学教育の改善・充実に関する調査研究協力者会議最終報告．平成19年3月28日．
3）中村　忍：大学外卒前医学教育：地域での医学教育Community-Based Medical Education．卒前医学教育の場としての大学附属病院．医教育 2003；34：147-52．
4）森田孝夫：医学教育の現状と展望 Ⅱ．新臨床研修制度の影響　2．大学病院の立場から．日内会誌 2007；96：2695-702．
5）厚生労働省ホームページ(http://www.mhlw.go.jp)
6）日本プライマリ・ケア学会ホームページ(http://www.primary-care.or.jp)

吉村　明修
昭和57年 日本医科大学卒業
現在，日本医科大学内科学講座呼吸器・感染・腫瘍部門／教育推進室准教授
専門分野：医学教育学，呼吸器内科

Asian Pacific Journal of Disease Management
Volume 2, Number 2, April 2008
(The official journal of the Japan Society of Health Support Science)

Development of the Automated Diagnosis CT Screening System for Visceral Obesity

Toru Nakagawa, Syuichiro Yamamoto, Masataka Irokawa

Review

Asian Pacific Journal of Disease Management 2008; 2(2), 31-38

Development of the Automated Diagnosis CT Screening System for Visceral Obesity

Toru Nakagawa[1)], Syuichiro Yamamoto[1)], Masataka Irokawa[1)]

[1)]Hitachi, Ltd., Hitachi Health Care Center

Abstract

The Japanese Society of the Study for Obesity defines "obesity" by the following two definitions; 1. BMI (Body Mass Index) of 25 and more. 2. Man with the waist circumference more than 85 cm and Visceral Obesity more than 100 cm^2, woman with the waist circumference more than 85 cm and Visceral Obesity more than 100 cm^2. Visceral fat can be manually calculated from the CT film but it could not be applied to the mass screening program such as health check ups where it is required to treat large volume of data. This is a principal obstacle for the introduction of CT based check up system for visceral fat. In order to solve this problem, we have developed a new software program that makes it possible to automatically calculate the waist circumference, visceral fat and subcutaneous fat form the CT imaging. In this article, the authors explain the general features of this new system.

Key words: obesity, visceral fat, metabolic syndrome, CT scanner, health check up

❖ Introduction

According to the Law of the medical services for the aged, a new health promotion program, so called "Health checkups and healthcare advice with a particular focus on the metabolic syndrome" program was introduced from April 2008. All insured between 40 and 74 receive the health check up for visceral fat (measured by waist circumference), hypertension, hyperglycemia and dyslipidemia. The most risky group, so called "active assistance necessary" must receive the visceral fat reducing health program for three to six months. The main target of this new health screening program is so called metabolic syndrome.

Along with the governmental campaign for the new program, the word of metabolic syndrome is becoming very popular. This situation attracts a much concern of citizens for visceral fat and obesity. A rapid increase of obesity prevalence is becoming a very important health problem in Japan. For example, it is observed a rapid decrease of life expectancy in Okinawa prefecture that has long been famous for its longevity. One of the reasons of this decrease in life expectancy is thought due to the increase of obesity prevalence among the Okinawa male. According to the National Nutritional Survey, 50% of the Okinawa males were evaluated as "obese" (BMI >= 25). This figure corresponds to the twice higher obesity prevalence than the national average[1)].

The main reasons of obesity among the middle age persons are too much caloric intake and sedative life based on decrease in Basal Metabolic Rate. It has been reported that the Japanese show relatively higher possibility of health problems by small increase in obesity level compared with other races[2, 3)]. In fact many glucose intolerance cases are observed among the not obese persons. This finding indicates that BMI is not enough for evaluating the risk of individual person.

In order to appropriately predict the future CHD risk, the concept of metabolic syndrome was constructed. Metabolic syndrome is a syndrome that composes of visceral obesity, insulin resistance, low HDL cholesterol, high triglyceride, hypertension. Metabolic syndrome attracts wide attention as a high risk

Received: July 3, 2008
Accepted: August 12, 2008
Correspondence: T. Nakagawa, Radiological Diagnosis Dept., Hitachi, Ltd., Hitachi Health Care Center, 4-3-16, Ose, Hitachi-shi, Ibaraki-ken, 317-0076, Japan
e-mail: tohru.nakagawa.rh@hitachi.com