Demonstration of Nasogastric Intubation using Video Compact Disc as an Adjunct to the Teaching Processes

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Background: *An in-house produced video compact disc (VCD) demonstrating nasogastric intubation was introduced to the medical curriculum at Buddhachinaraj Hospital, Clinical Teaching Centre, Phitsanulok in 2005.*
Objective: *The present study aimed to qualitatively evaluate the effect of the VCD on our medical students' procedural skills.*
Material and Method: *The 6th year medical students were randomly allocated into two groups; one group viewed the VCD (test, n = 30), and the other group did not (control, n = 31). After 2 months, the authors examined all students by asking them to perform the procedure using a manikin and a checklist. The examiners were blind to the allocations at the time of examination. Unpaired t-tests and Chi-square tests were used. Data are expressed as mean and SD.*
Results: *Total checklist's score was 20. There was no difference in terms of age or gender between the two groups. Thirty of 61 medical students who had watched the VCD got an average score of 15.9 $\pm$ 1.86, while the control group's average score was 13.2 $\pm$ 1.94. Statistical analyses showed that the difference was significant ($p < 0.0001$).*
Conclusion: *The medical students were able to self-improve their procedural skills of nasogastric intubation after viewing the VCD. Application of this method to other basic procedures may be useful.*

Keywords: *Nasogastric intubation, Procedural skills, Self-directed learning*

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Before becoming physicians, medical students are required to learn a considerable amount of knowledge and a number of skills. Some of the most important skills are technical or procedural in nature. Generally, a training course involves a variety of procedures that are performed a number of times. In a survey of clinical skills training, the students' satisfaction with their clinical practice correlated with the number of times they performed the procedures[1]. However, some authors found that the majority of medical schools provided only a small number of procedural training courses[2-4]. In the course of their daily activities, the students do not have consistent supervision when performing procedures[4-6]. Consequently, students may not master all of the basic procedural skills after completion of the courses. Thus, the current teaching system is probably inadequate and inefficient. A compelling course of training that uses a consistent clinical skills checklist would give students more confidence in their procedural skills[7].

Conventionally, all fourth-year medical students at the institution have been taught about nasogastric intubation by senior students or nurses outside of any specific course. As a result, their knowledge and procedural skills depend heavily on their instructors. As a part of the effort to standardize teaching in

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the hospital, the staffs produced a video compact disc (VCD) demonstrating how to perform the procedure. While the VCD was being implemented, the authors conducted the present study to evaluate its effect on our medical students' procedural skills. Therefore, the present study was aimed to qualitatively evaluate the effect of the VCD on our medical students' procedural skills.

Material and Method

One of the authors developed and produced a 20 minutes long audio-videotape about nasogastric intubation using two volunteer student actors and a volunteer from the hospital personnel. The students acted as narrator and practitioner, while the volunteer acted as a simulated patient. The VCD was made in December 2005 in the Audiovisual Unit. The VCD demonstrated how to perform nasogastric intubation correctly and also embraced a range of other knowledge about the procedure such as how to maintain the nasogastric tube, how to remove the tube and how to perform gastric lavage.

Although ethical approval was sought, the approval was not required because the program constituted a compulsory requirement for all medical students. In order that the study did not make an impact on our fourth-year medical students' grades, 61 sixth-year students enrolled in the present study. They were randomly allocated into two groups. The test group, 30 of 61 students, watched the VCD, while the control group did not. Two months later, both groups were assessed regarding their procedural skills. The examiners evaluated the students by adding the assessment to the final examination and asking them to perform the procedure using a manikin and a checklist (Table 1). The check list and the VCD are based on an article reviewed by one of the authors. At the time of assessment, they were examined by two of the authors who were blind to the group allocations. The results were utilized only for analyses in the present study and were not included in the students' grades.

Unpaired t-tests and Chi-square tests were used where appropriate. All data are expressed as mean and SD. SPSS software version 10.0 (SPSS Inc., Chicago, IL) was used for all statistical analyses. A p-value of less than 0.05 was considered significant difference between groups.

Results

Of 61 sixth year students, 33 were female and 28 were male. The test group consisted of 20 females and 10 males, whereas the control consisted of 13 females and 18 males ($p = 0.073$). A checklist containing all of the necessary steps for nasogastric intubation had a complete score of 20. The test group had an average score of 15.9 ± 1.86, whereas the control group's average score was 13.2 ± 1.94, ($p < 0.0001$).

There was only one student in the control group who did not wear gloves. The number of students who watched the VCD that could remember to introduce themselves, to adjust the patient's position correctly, and to examine the patient's nostrils before performing the procedure was significantly greater than that of the students in the control group ($p < 0.01$). A few students in both groups forgot to notify the patient regarding indications and possible complications (5/61), to measure the tube distance (4/61), and to lubricate the tube's distal end (2/61). Likewise, most of them inserted the tube horizontally along the floor of the nose (54/61) and instructed the patient to swallow before advancing the tube as the patient was swallowing (59/61). There was no significant difference between the two groups with respect to these aspects ($p > 0.05$).

Regarding the response when they experienced resistance while they were inserting the tube, there was no significant difference between the groups. Approximately half of both groups (37/61) decided to pause for a moment in order that the patient could regain his or her composure so that the procedure could continue. Some of the students responded reasonably to the examiners that they would withdraw the tube immediately if the patient showed signs of cyanosis or changes occurred in the patient's respiratory status (45/61), or if the tube coiled in the mouth (34/61). Most of the students in both groups (49/61) tried the other nostril when they encountered a significant resistance. No significant difference was demonstrated in all of these aspects.

The majority of the students (56/61) aspirated a sample of the gastric contents and considered its appearance. There was no difference between the 2 groups. All of them listened to the borborygmus sound with a stethoscope while insufflating a small amount of air via the tube. Only 12 of 61 students recognized testing the gastric contents with pH indicator strips. The number of students in the test group performed the test significantly better than the students in the control group ($p < 0.01$). About half of all students (28/61) remembered to use X-rays. Twenty-seven of 31 students in the control group and all students in the test group secured the tube after accomplishing the

Table 1. Question and checklist\

Question:	
Supposing the manikin you are seeing is a patient who needs nasogastric intubation, please demonstrate how to insert the nasogastric tube.	
Checklist:	
1. Universal precaution: wear gloves	1 point
2. Patient notification:	
Introduce yourself	1 point
Notify of the procedure	1 point
3. Adjust the patient's position: in upright or high Fowler's position	1 point
4. Tube insertion:	
Examine nostrils	1 point
Measure the tube distance	1 point
Lubricate the end of the tube	1 point
4.1 Examiner asks "What would you do while inserting the tube?"	
Insert the tube horizontally along the floor of the nose	1 point
Instruct the patient to swallow and advance the tube as the patient swallows	1 point
4.2 Examiner asks "What do you do if you meet resistance?"	
Pause for a moment and then advance downward again	1 point
4.3 Examiner asks "In what circumstance must the tube be withdrawn immediately?"	
If the patient's skin changes colours or changes occur in the patient's respiratory status	1 point
If the tube coils in the mouth	1 point
4.4 Examiner asks "What would you do if you encounter significant resistance?"	
Try the other nostril	1 point
4.5 Examiner asks "How can you check the placement of the tube?"	
Aspirate a sample of the gastric contents and consider its appearance	1 point
Listen to borborygmus sound with stethoscope while insufflating a small amount of air via the tube	1 point
Test the aspirated contents with pH indicator strip	1 point
Obtain an X-rays	1 point
4.6 Examiner asks "What will you do next?"	
Secure the tube	1 point
Aspirate stomach contents or connect the tube connector to a container or suction device	1 point
Document the reasons for and the results of the procedure	1 point

* For question 4.1-4.6 the examinee's response may vary from those practical in the text

procedure. All of the students aspirated or drained the stomach contents, but forgot to document the reasons for and the results of the procedure.

Discussion

Nasogastric intubation constitutes a basic procedure that all medical students are required to learn and perform. In order to perform the procedure, the students need good knowledge and practice. Unfortunately, the spectrum of the procedure performed by practitioners has considerably varied. It was found that nurses routinely insert nasogastric tubes in daily activities on the ward[6]. The change entails a decrease in students' experience with the procedure. Moreover, procedural training courses regarding the procedure are inconsistent[4-6,8]. The students have been taught outside of any specific course by instructors other than house staff. As a result, the students might not master nasogastric intubation when the course is complete. Like at the department of surgery, there is no specific training course with respect to mastering of the procedure.

The objective was to establish a compelling medical curriculum that embraces consistent courses and audible media. After the VCD demonstrating how to perform nasogastric intubation was introduced to the medical curriculum, the authors evaluated its effect on our students. The results showed that the students who had watched the VCD were able to perform the procedure better than those who had not (based on the check list). Since the study was designed to make the examiners not know the group allocations, it is unlikely that the present results were biased by the examiners. In fact, learning the procedure is a complex task that requires cognitive and affective skills, apart from knowledge of its indications and contraindica-

tions[9]. In addition, the practitioners should know how to explain clearly the indications, risks and benefits to the patients, as well as how to obtain informed consent before practicing. However, the present study exclusively examined the students' technical skills. To address this problem, a future study needs to include all of these aspects into the assessment. Interestingly, teaching in cognitive skills in the early stages of a medical degree, particularly in a preclinical course, can have a long-term positive effect on the students' basic procedural skills competence and may increase the students' confidence to practice their procedural skills[10,11].

Based on the findings of the present study, the authors would like to recommend the use of self-directed learning method that allows the students to view the VCD more than one time. Although one randomized controlled trial demonstrated no difference between directed learning and self-directed learning, the reason for these findings might result from the majority of students who could learn equally effectively[12]. However, the benefits of self-directed learning that implemented a video self-instructional system have been frequently identified in the medical literature[13-15]. In addition, some authors reported that introduction of a new technique using videotape instruction was able to make an impact on practitioners[16].

In conclusion, the presented medical students were able to self-improve their procedural skills after viewing the demonstration using VCD. Application of this method to other basic procedures and making the VCD available for further viewing (self-directed learning) may be useful.

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การใช้สื่อวีดิทัศน์แสดงการใส่สายคากระเพาะอาหารทางจมูกในการจัดการเรียนการสอน

ไพบูลย์ สุขโพธารมณ์, ธีระ ศิริอาชาวัฒนา, ยงยศ จริยวิทยาวัฒน์, ไพศาล เวชชพิพัฒน์

วัตถุประสงค์: *ศูนย์แพทยศาสตรศึกษาชั้นคลินิก โรงพยาบาลพุทธชินราช พิษณุโลก ได้จัดทำวีดิโอซีดีแสดงวิธีการใส่สาย nasogastric tube เมื่อปี พ.ศ. 2548 เพิ่มเติมในหลักสูตรแพทยศาสตรศึกษา จากนั้นจึงทำการศึกษาผลลัพธ์ที่ได้ต่อความชำนาญของนิสิตแพทย์ในการทำหัตถการดังกล่าว*

วัสดุและวิธีการ: *สุ่มแบ่งนิสิตแพทย์ ชั้นปีที่ 6 ออกเป็น 2 กลุ่ม กลุ่มหนึ่งจำนวน 30 คนได้ดูวีดิโอซีดี อีกกลุ่มหนึ่งจำนวน 31 คนไม่ได้ดู หลังจากนั้นเป็นเวลา 2 เดือนมีการทดสอบความสามารถในการทำหัตถการดังกล่าวโดยใช้หุ่นจำลองและใบตรวจสอบคะแนน ผู้คุมสอบไม่ทราบว่าใครได้ดูวีดิโอซีดีบ้าง และค่าสถิติที่ใช้ในการคำนวณประกอบด้วยการทดสอบแบบที ชนิดอันแพร์ และ ไคสแคว์ ตามความเหมาะสม โดยแสดงเป็นค่าเฉลี่ย และค่าเบี่ยงเบนมาตรฐาน*

ผลการศึกษา: *ไม่พบความแตกต่างในแง่ของอายุ และเพศของทั้งสองกลุ่ม จากคะแนนเต็ม 20 คะแนน กลุ่มที่ได้ดูวีดิโอซีดีได้คะแนนเฉลี่ย 15.9 $\pm$ 1.86 คะแนน ในขณะที่กลุ่มที่ไม่ได้ดูได้คะแนนเฉลี่ย 13.2 $\pm$ 1.94 คะแนน โดยพบค่าความแตกต่างอย่างมีนัยทางสำคัญทางสถิติ ($p < 0.0001$)*

สรุป: *นิสิตแพทย์ที่อยู่ในกลุ่มทดลองสามารถแสดงขั้นตอนการใส่สายคากระเพาะอาหารทางจมูกได้ดีขึ้นหลังจากได้ดูวีดิโอซีดีเมื่อเทียบกับกลุ่มควบคุม การจัดทำวีดิโอซีดีแสดงขั้นตอนการทำหัตถการพื้นฐานอื่นๆ ด้วยน่าจะมีประโยชน์*