

## Knowledge base of doctors and nurses participating in a trauma workshop

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**Objective:** To identify the knowledge base of doctors and nurses attending a trauma workshop. **Methods:** All participants of a trauma workshop were distributed a pre-test questionnaire with 30 type A questions. Questions on patient assessment and the management of airway, breathing and circulation were included. Scores were analysed with regard to the specialty and years since graduation. The difficulty and discrimination indices of individual question were analysed. **Results:** 95 participants (33 were doctors) took the test. The participants were from the departments of surgery (41%), orthopaedics (24%), anaesthesia (20%) and emergency medicine (9%). The mean years from graduation of the participants were 3.22 (SD 3.77) for doctors and 3.56 (SD 6.06) for nurses. The mean score was 54% (SD 17%) for the whole group. The mean score of doctors was 68%, which was significantly higher than the nurses' score of 46%. ( $P < 0.001$ ) The mean score of Emergency Department doctors (82%) was highest among the four groups but the differences were not statistically significant. Non-surgical trainees (anaesthesia, emergency medicine) had statistically significant better scores than surgical trainees (surgery, orthopaedics, neurosurgery) in airway ( $p = 0.02$ ) and breathing ( $p = 0.03$ ) There were no statistically significant differences among the four doctor groups in the other sub-scores. For the doctors, only 3 questions had a correct response rate of less than 40%. On the contrary, for the nurse group, 13 questions attracted a correct response rate of less than 40%. **Conclusions:** A pre-test was useful in helping us understand more about the knowledge base of different groups of participants (*Hong Kong j.emerg.med.* 2000;7:81-84)

**Keywords:** Knowledge, trauma, pre-test, workshop

### Introduction

Injury and poisoning have been the fifth major killer in Hong Kong in the past decades.<sup>1</sup> In the 15 to 44 age group, injury and poisoning is only second to malignant neoplasm as the most important killer. Recently, local hospitals have tried to improve trauma care by responding to major trauma with organised trauma teams. For the team to function properly, all team members should be knowledgeable in trauma care and use the same

language. Our hospital has organised a workshop on the initial management of trauma victims. The objective of this study was to identify the knowledge base of doctors and nurses attending the trauma workshop. It is hoped that by identifying gaps in our knowledge, we can better equip ourselves to face the challenge.

### Methods

The trauma workshop was a one-day event with didactic lectures in the morning and practice sessions in the afternoon. Course material was given to the participants on the day of the workshop. Participants included doctors and nurses from the departments of anaesthesia, emergency medicine, intensive care, orthopaedics, and surgery. Each participant was asked to take a pre-test just before the start of the programme. Thirty type A questions on patient assessment and the management of airway, breathing and circulation were included.

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Total scores and sub-scores were analysed with regard to the specialty and years since graduation. Mean scores were compared using Students t-test and  $P < 0.05$  was taken as significant. The difficulty and discrimination indices of individual question were analysed. The difficulty index is the percentage of participants with a correct answer. Discrimination index is the difference between the percentage of correct answers by participants with a score of equal or over 80% to those who scored less.

## Results

A total of 95 participants, of whom 33 were doctors, took the test. The breakdown of participants was shown in Table 1. The mean years from graduation of the participants were 3.22 (SD 3.77) for doctors and 3.56 (SD 6.06) for nurses. All the doctors were trainees and 75% (24) were within three years after graduation. In the nurse group, 32% (20) were nursing officer or above and the rest were mainly registered nurses. The specialty affiliation of the participants was given in Table 1.

The mean score was 54% (SD 17%) for the whole group. The mean score of doctors was 68, which was significantly higher than the nurses' score of 46. ( $P < 0.001$ ) Only six doctors and two nurses

achieved a score of 80% or higher. Nurses' sub-scores in airway management, primary and secondary survey were notably lower than those of the doctors. The differences in the sub-scores were statistically significant ( $P < 0.001$ ) except the sub-score on assessment of breathing. (Table 2)

The mean total scores of Emergency Department doctors' (82) and nurses' (65) were highest among the groups (Tables 3 & 4) Non-surgical trainees (anaesthesia, emergency medicine) had statistically significant better scores than surgical trainees (surgery, orthopaedics, neurosurgery) in airway ( $p = 0.02$ ) and breathing ( $p = 0.03$ ) management. (Table 5) There were no statistically significant differences among the three doctor groups in the other sub-scores.

The difficulty and discrimination indices of individual questions were listed in Table 6. For the

**Table 1.** Breakdown of participants by specialty.

Specialty	Doctors (%)	Nurses (%)
Surgery	14 (42.4)	19 (30.6)
Orthopaedic surgery	6 (18.2)	16 (25.8)
Anaesthesia	6 (18.7)	9 (14.5)
Emergency Medicine	4 (12.1)	4 (6.5)
Others	–	6 (9.7)
Missing	3 (9.1)	8 (12.9)
<b>Total</b>	<b>33</b>	<b>62</b>

**Table 2.** Scores of participants.

Scores	Mean for doctor (std deviation)	Mean for nurses (std deviation)
Airway	69.70 (23.52)	45.16 (24.28)
Breathing	64.39 (25.02)	56.05 (26.66)
Circulation	66.29 (20.61)	49.60 (18.66)
Primary Survey	74.03 (20.03)	48.16 (22.88)
Secondary Survey	62.63 (14.45)	35.75 (18.32)
<b>Total</b>	<b>67.68 (13.98)</b>	<b>46.61 (14.24)</b>

NB: The differences in all the mean scores (except breathing) for doctors and nurses are statistically significant ( $P < 0.001$ ).

**Table 3.** Comparison of doctor scores by specialty.

Mean scores	Surgical (n=20)	Anaesthesia (n=6)	Emergency medicine (n=4)
Airway	63	77	95
Breathing	59	75	87
Circulation	69	54	81
Primary Survey	75	69	82
Secondary Survey	63	66	71
<b>Total</b>	<b>67</b>	<b>66</b>	<b>82</b>

**Table 4.** Comparison of nurse scores by specialty.

Mean Scores	Surgical (n=35)	Anaesthesia (n=9)	Emergency Medicine (n=4)
Airway	41	58	60
Breathing	56	56	81
Circulation	49	47	66
Primary Survey	47	52	61
Secondary Survey	32	31	63
<b>Total</b>	<b>45</b>	<b>48</b>	<b>65</b>

**Table 5.** Comparison of mean scores for different groups of doctors.

Mean scores	Surgical trainees	Non-surgical trainees	P value
Airway	63	84	.021
Breathing	59	80	.025
Circulation	69	65	.639
Primary Survey	75	74	.931
Secondary Survey	63	65	.763
<b>Total</b>	<b>66.8</b>	<b>72.3</b>	<b>.325</b>

Surgical trainees = general surgery, orthopaedic surgery, neurosurgery

Non-surgical trainees = anaesthesia, emergency medicine

**Table 6.** Difficulty and discrimination indices of the test questions.

Question no	Classification	Doctor		Nurse	
		Difficulty	Discrimination	Difficulty	Discrimination
1	B	66.7	20.3	56.5	45
2	C	48.5	63	33.9	68.3
3	P	90.9	11.1	85.5	15
4	P	93.9	7.4	61.3	40
5	C	90.9	11.1	72.6	28.3
6	C	87.9	14.8	33.9	-35
7	A	93.9	7.4	71	30
8	P	78.8	-14.8	54.8	-56.7
9	S	33.3	0	29	73.3
10	S	97	3.7	91.9	8.3
11	A	66.7	40.7	32.3	70
12	C	36.4	57.4	48.4	53.3
13	C	51.5	18.6	69.4	31.7
14	S	48.5	63	14.5	88.3
15	C	78.8	5.5	22.6	-23.3
16	C	48.5	42.6	30.6	71.7
17	A	69.7	37	50	51.7
18	P	60.6	48.1	25.8	76.7
19	A	39.4	53.7	14.5	88.3
20	A	78.8	25.9	58.1	43.3
21	B	78.8	5.5	71	30
22	B	57.6	31.4	51.6	50
23	P	54.5	-5.6	56.5	-58.3
24	P	69.7	37	30.6	71.7
25	B	54.5	14.8	45.2	56.7
26	S	66.7	0	30.6	-31.7
27	C	87.9	14.8	85.5	15
28	P	69.7	16.6	22.6	80
29	S	69.7	-3.7	32.3	-33.3
30	S	60.6	27.7	16.1	86.7

**A= airway; B=breathing; C=circulation; P=primary survey; S=secondary survey****Difficulty** = % of participants giving correct answers**Discrimination** = Difference (in %) of participants with a score above and below 80% giving correct answers to the particular question

doctors, 18 out of 30 questions had a correct response rate of over 60% and only 3 questions had a correct response rate of less than 40%. On the contrary, for the nurse group, 13 questions attracted a correct response rate of less than 40%.

## Discussion

Trauma care is an important aspect in hospital practice. Many local hospitals have an organised team response for patients with multiple injuries. Our hospital has identified the need for trauma education to members of the team. The team usually consists of doctors and nurses from emergency department, surgery, orthopaedic surgery, anaesthesia, intensive care and neurosurgery. A hospital-based education programme not only improve staff knowledge but also co-operation among team members by teaching them to speak a common language in trauma care.

Since these doctors and nurses are from different backgrounds and stages of training, the education process will be greatly facilitated if the trainer has a better idea of what they know and, perhaps more important, what they do not know. A pre-test can help us in planning future courses.

The mean score for doctors was 68, which was comparable to some pre-ATLS MCQ score reported in the literature.<sup>2,3</sup> Although our test was not an ATLS test, the format was similar. The nurses' mean score was lower than the physicians' which was not unexpected given their education background. Their score was comparable to the pre-ATLS score of senior medical students at a Canadian University.<sup>4</sup>

From the sub-scores, it would appear that surgical trainees were weaker at airway and breathing management. More training on these 2 areas should be targeted for surgical trainees. For the nurses,

questions on secondary survey attracted the lowest score. Obviously, this is an area where the educator should concentrate on in future courses.

Seven questions were correctly answered by over 80% of the doctor group. The questions seem to be too easy but this is sometimes inevitable in a criterion-based test as some important concepts though obvious need to be tested.<sup>3</sup> Thirteen questions had less than 40% correct response rate for the nurses. These questions were probably too difficult for the nurses. It may be helpful to have a separate test for nurses stressing on correct nursing response in multiple injuries. For the doctors, there were only 5 questions, which had a discrimination value of greater than 40%. Three questions actually had negative discrimination value. These questions should be reviewed and they may need improvement.

## Conclusions

A pre-test was useful in helping us understand more about the knowledge base of different groups of participants.

## References

1. Hospital Authority. Statistical Report 1995/96. Statistical Information Section, Hospital Authority, 1996.
2. Ali J, Cohen R, Adams R, et al. Attrition of cognitive and trauma management skills after the advanced trauma life support (ATLS) course. *J Trauma* 1996; 40(6):860-6.
3. Ali J, Adams R, Stedman M, et al. Cognitive and attitudinal impact of the advanced trauma life support program in a developing country. *J Trauma* 1994;36(5):695-702.
4. Ali J, Cohen R, Reznick R. Demonstration of acquisition of trauma management skills by senior medical students completing the ATLS program. *J Trauma* 1995;38(5):687-91.