

## Analysis of Layperson's Attitude to Perform Mouth-to-Mouth Ventilation in Cardiopulmonary Resuscitation

I-Yin Lin, MD; Tzong-Luen Wang, MD, PhD

### Abstract

To understand the attitude of the laypersons in DMAT in performing mouth-to-mouth ventilation during CPR, we designed a prospective study to investigate the likelihood of the laypersons in doing CPR with mouth-to-mouth ventilation and discuss the possible interfering factors involved. We enrolled the specialists and experts of disaster medicine and designed the basic training course of local DMAT since January 2002. We conducted eight shows of basic training course in city and country of Taiwan during one year. Five hundred laypersons who attended in the training course of DMAT were included. Of them, 400 students attended the basic training course of Taiwan Society of Disaster Medicine (Group A) and another 100 the program of other Societies (Group B). There is overall 2.0% (10/500) of the participants that would voluntarily performed CPR such as mouth-to-mouth ventilation without hesitation. For comparison, there was significant difference between group A and group B (2.3% (9/400) vs. 1.0% (1/100),  $P < 0.05$ ). The reasons are lack of legal protection such as Good Samaritan Law constituted 32.4%, wonder in the degree of authorization 28.1%, lack of self-confidence 4.3% and worry about possible disease transmission 33.5%. Legal protection, education and public media are three bigs in resolving the dilemma. (*Ann Disaster Med.* 2004;2:67-73)

**Key words:** CPR; Laypersons; DMAT; Lawsuits

### Introduction

For a disaster medical assistant team (DMAT) member, basic life support is essential knowledge and skill. Although most of the DMAT members are from medical physicians, nursing staffs, emergency medical technicians and other medical staffs, there are still a substantial portion of DMAT members (even in a national DMAT) who may merely be the laypersons.<sup>1</sup> For those who are innocent in any training or

education in medicine, their attitude is also a crucial part of efficiency in disaster rescue and management.

Cardiopulmonary resuscitation (CPR) performed by bystanders has been proven to improve survival in victims of out-of-hospital cardiac arrest and other life-threatening conditions such as drowning and respiratory arrest. However, CPR is not practically performed for the majority of victims who require lifesaving

---

From Department of Emergency Medicine, Shin-Kong Wu Ho-Su Memorial Hospital, Taipei, Taiwan  
Address for reprints: Dr. Tzong-Luen Wang, Department of Emergency Medicine, Shin-Kong Wu Ho-Su Memorial Hospital, 95 Wen-Chang Road, Taipei, Taiwan  
Received: Sep 21 2003. Revised: Sep 30 2003. Accepted: Oct 10 2003.  
TEL: 886-2-28332211 ext 2087 FAX: 886-2-28353547 E-mail: M002183@ms.skh.org.tw

care even after so many years of CPR education in Taiwan. Studies have identified reluctance to perform mouth-to-mouth ventilation as a significant psychological barrier to frequent performance of bystander CPR.<sup>2</sup> It has been reported that laypersons are not performing cardiopulmonary resuscitation (CPR) because of concerns about performing mouth-to-mouth resuscitation.<sup>3-6</sup> The evidence for this inference was even drawn primarily from samples of healthcare professionals, who expressed concerns about disease transmission.<sup>5,6</sup> Because the attitude of performance is closely related to the clinical efficiency in disaster rescue and management, we do urge to know what the attitude of the laypersons in DMAT is concerning the performance of mouth-to-mouth ventilation for CPR. We then designed the following prospective study to investigate the likelihood of the laypersons in doing CPR with mouth-to-mouth ventilation and discuss the possible interfering factors involved.

## Methods

### Study design

We enrolled the specialists and experts of disaster medicine and designed the basic training course of local DMAT since January 2002. We conducted eight shows of basic training course in city and country of Taiwan during one year. Basic life support program was incorporated as a part of basic training of DMAT during each course. The laypersons who attended the training program were enrolled in this study.

Each participants enrolled was inquired the following questions.

1. Would you perform mouth-to-mouth ventilation during bystander CPR?
2. If the answer of question 1 is NO, please

check the following possible reasons for your reluctance to take the step.

- A. Concerns in possible disease transmission
- B. Wonder in the degree of authorization
- C. The problem of lawsuit
- D. Lack of self-confidence in CPR
- E. Purely unexplained psychological barrier
- F. Others: please specify

### Statistic analysis

All the data were processed and analyzed with Microsoft Excel 2000 for Windows. The techniques applied to data analysis included descriptive statistics generating and independent samples t-test and chi-square test. We compared the percentage of failure between the students from Taiwan Society of Disaster Medicine and those from other Societies by chi-square test. The differences in the performance of students were examined by an independent samples t-test. A *P* value less than 0.05 was considered as statistically significant.

### Results

There were 500 laypersons who attended in the training course of DMAT and were included in this study. Of them, 400 students attended the basic training course of Taiwan Society of Disaster Medicine (Group A) and another 100 the program of other Societies (Group B). There is overall 2.0% (10/500) of the participants that would voluntarily performed CPR such as mouth-to-mouth ventilation without reluctance. For comparison, there was significant difference in the attitude to do mouth-to-mouth ventilation as bystanders between group

A and group B (2.3% (9/400) vs. 1.0% (1/100),  $P < 0.05$ ). In other words, those attending DMAT had higher possibility to do mouth-to-mouth ventilation if necessary than other laypersons did.

As to the factors unwilling to perform necessary mouth-to-mouth ventilation, lack of legal protection such as Good Samaritan Law constituted 32.4% (159/490), whereas wonder in the degree of authorization 28.1% (138/490), lack of self-confidence 4.3% (17/490) and worry about possible disease transmission such as SARS or other infectious diseases 33.5% (164/490). Table depicts the difference in distribution of the above factors between two groups. Laypersons that attending CPR training program (group B) had higher concerns on disease transmission, lack of self-confidence and psychological barrier and lower consideration in authorization.

## Discussion

This study has demonstrated that there were still few persons who have accepted CPR training and would be voluntarily willing to perform mouth-to-mouth ventilation for those with out-of-hospital arrest. The policy will be how to encourage them to initiate resuscitation. Some recent reports revealed that some report's misleading titles that have created dangerous false

impressions in the minds of the public, such as the notion that CPR without ventilations is beneficial, and that the risk of disease transmission by mouth-to-mouth contact is substantial have really prevented layperson from doing correct CPR if indicated.<sup>7-10</sup> Because the report ignores most existing research pertaining to the failure of CPR by lay bystanders to become widespread, it fails to set a useful agenda for further research aimed at increasing bystander-initiated resuscitation efforts. We are not sure if the same impact has such substantial effects on our people.

Our data showed that most of the people do not perform CPR with mouth-to-mouth ventilation because of possible unpleasant lawsuits. In Taiwan, there is still no legal protection such as Good Samaritan Law in the United States. Most of the medical law has posed many obligations to those with special duties of medical care such as EMT, medical physicians, and nursing staffs. Violation of some obligations may be even treated with criminal punishment. For the laypersons, there is also no law or regulation that encourage them to perform CPR for others. Even civil codes may pose compensation on those who performed CPR with good faith but may still have complications. All of these truths do decrease the motives of the laypersons to save others by their best.

**Table.** Reasons of unwilling to perform mouth-to-mouth ventilation

	Group A (n=391)	Group B (n=99)	P value
Concerns in possible disease transmission	118 (30%)	46 (47%)	<0.05
Wonder in the degree of authorization	136 (35%)	2 (2%)	<0.01
The problem of lawsuit	125 (32%)	34 (34%)	NS
Lack of self-confidence in CPR	8 (2%)	9 (9%)	<0.05
Purely unexplained psychological barrier	4 (1%)	8 (8%)	<0.05
Others	0 (0%)	0 (0%)	0

Education and public media may be another important consideration. As mentioned above, some reports concerning new idea of CPR may surprisingly distort the correct concept of the performance. Some people believe CPR can be done without ventilation whereas others the infection rate is high. All of these misconcepts may be transmitted by incorrect reporting by the public media. The fact is out-of-hospital cardiac arrest and bystander action are more explanatory of the failure of bystander CPR. CPR is not performed by lay bystanders primarily because most lay bystanders are not trained to perform CPR. Organized training is not targeted to those most likely to be present at the scene of a cardiac arrest. While the typical cardiac arrest victim is 64 years of age,<sup>2</sup> and the family member at home is about 55 years old,<sup>3</sup> the average age of CPR trainees is 31 years, with a small minority 55 years and older. Fewer than 8% of course participants take CPR training because they live with someone at elevated risk of heart attack.<sup>4,5</sup> In addition, 74% or more of cardiac arrests occur in the home,<sup>6-9</sup> and less than 7% occur in public places.<sup>10</sup> Therefore, it is likely that the victim is not a stranger to the bystander and disease transmission is not a primary concern. In addition, a layperson's decision and ability to respond to an emergency situation depend on a unique set of factors unlike those affecting medical professionals and paraprofessionals. Therefore, medical providers' legitimate concerns about disease transmission may not play a pivotal role in the decision-making process of lay bystanders. Compared with laypersons, medical providers have more training and experience, a duty to act, a different relationship to their cardiac arrest victims, and materi-

als for the prevention of disease transmission at their disposal. Laypersons, on the other hand, have a socialized fear to avoid approaching "dead looking" things. According to the psychological research on "helping behavior",<sup>11-18</sup> factors inherent in the decision to act, arise from the initial response to threatening, unfamiliar, and/or complex situations. The decision to act depends upon, among other things, acknowledging that the situation exists and having confidence in one's ability to handle the emergency. In this calculus of action, an unaccustomed concern of laypersons, such as disease transmission related to mouth-to-mouth resuscitation, will be but one, most likely trivial, factor that presents itself later, after the decision to take action has been made. Helping behavior research has focused on lay response to public assault, medical emergencies, and trauma involving strangers, but research on lay responses to the most common type of cardiac arrest, one striking a family member, is nearly nonexistent.

Even if training were targeted to the right people, the quality of lay resuscitation efforts most likely will be insufficient to sustain life. Immediately following training, CPR trainees are not competent in performing ventilations of sufficient volume to cause chest rise and compressions of sufficient depth to cause cardiac perfusion and artificial pulse at the neck,<sup>20-24</sup> the basic CPR components related to positive outcome.<sup>25-27</sup> Because feelings of competence are critical to the decision to take action,<sup>13-14</sup> lack of competence may be partially responsible for low rates of initiation.

In light of the strong evidence that other factors are responsible for the low rates of bystander CPR, we urge that legal protection and correct education about the attitude and under-

standing may be the first priority. The argument that laypersons do not initiate CPR because of fear of performing mouth-to-mouth breaths should not be frequently mentioned because it may have positive feedback on respondent's reluctance. Training organizations should target CPR training to laypersons with high exposure to individuals with heart disease. Training organizations improve CPR training programs to produce competent CPR performance immediately after training.

In summary, CPR with mouth-to-mouth ventilation is an essential step for those who are engaged in DMAT. What may be surprising is that only few of them will be in reluctant to perform CPR with mouth-to-mouth immediately if indicated. Legal protection, education and public media are three bigs in resolving the dilemma.

## References

1. Wang TL, Chang H. Composition of DMAT personnel in Taiwan: comparison with USA system. *Ann Disaster Med* 2002; 1:11-19
2. Becker LB, Berg RA, Pepe PE, et al. A reappraisal of mouth-to-mouth ventilation during bystander-initiated cardiopulmonary resuscitation. *Circulation* 1997;96:2102-12
3. McCormack AP, Camon SK, Eisenberg MS. Disagreeable physical characteristics affecting bystander CPR. *Ann Emerg Med* 1989;18:283-5
4. Brennan RT. Student, instructor, and course factors predicting achievement in CPR training classes. *Am J Emerg Med* 1991;9:220-4
5. Goldberg JJ, Gore JM, Love DG, et al. Layperson CPR - Are we training the right people? *Ann Emerg Med* 1984;13:701-4
6. Pane GA, Salness KA. A survey of participants in a mass CPR training course. *Ann Emerg Med* 1987;16:1112-6
7. Lombardi G, Gallagher J, Gennis P. Outcome of out-of-hospital cardiac arrest in New York City. The pre-hospital arrest survival evaluation (PHASE) study. *JAMA* 1994;271:678-83
8. Eisenberg MS, Horwood BT, Cummins RO, et al. Cardiac arrest and resuscitation: A tale of 29 cities. *Ann Emerg Med* 1990; 19:179-86
9. Becker LB, Ostrander MP, Barrett J, et al. Survival from cardiopulmonary resuscitation in a large metropolitan area: Where are the survivors? *Ann Emerg Med* 1991; 20:355-61
10. Litwin PE, Eisenberg MS, Hallstrom AP, et al. The location of collapse and its effect on survival from cardiac arrest. *Ann Emerg Med* 1987; 16:787-91
11. Atkins JM, Zachariah BS. Location of cardiac arrests: implications for AED placement. *Prehospital and Disaster Medicine* 1996; 11:47
12. Shotland RL, Heinold WD. Bystander response to arterial bleeding: Helping skills, the decision-making process, and differentiating the helping response. *J Pers Soc Psychol* 1985;49:347-56
13. Darley JM, Latane B. Bystander intervention in emergencies: Diffusion of responsibility. *J Pers Soc Psychol* 1968;8: 377-82
14. Mogielnicki RP, Stevenson KA, Willemain TR. Patient and bystander response to medical emergencies. *Med Care* 1975;13: 753-62
15. Piliavin IM, Rodin J, Piliavin JA. Good

- samaritanism: An underground phenomenon? *J Pers Soc Psychol* 1969; 13:289-99
16. Latane B, Darley JM. Group inhibition of bystander intervention in emergencies. *J Pers Soc Psychol* 1968;10:215-21
  17. Latane B, Nida S. Ten years of research on group size and helping. *Psychol Bull* 1981;89:308-24
  18. Piliavin JA, Piliavin IM. Effect of blood on reactions to a victim. *J Pers Soc Psychol* 1972;23:353-61
  19. Shotland RL, Stebbins CA. Emergency and cost as determinants of helping behavior and the slow accumulation of social psychological knowledge. *Soc Psych Qu* 1983;46:36-46
  20. Locke CJ, Berg RA, Sanders AB, et al. Bystander cardiopulmonary resuscitation: Concerns about mouth-to-mouth contact. *Arch Intern Med* 1995;155:938-43
  21. Braslow A, Brennan RT, Newman MM, et al. CPR training without an instructor: Development and evaluation of a video self-instructional system for effective performance of cardiopulmonary resuscitation. *Resuscitation* 1997;34:207-20
  22. Brennan RT, Braslow A. Skill mastery in cardiopulmonary resuscitation training classes. *Am J Emerg Med* 1995;13:505-8
  23. van Kalmthout PM, Speth PAJ, Rutten JR, Vonk JTC. Evaluation of lay skills in cardiopulmonary resuscitation. *Br Heart J* 1985;53:562-6
  24. Mandel LP, Cobb LA. Initial and long-term competency of citizens trained in CPR. *Emergency Health Services Quarterly* 1982;1:49
  25. Wik L, Bircher NG, Steen PA. Quality of bystander cardiopulmonary resuscitation influences outcome after prehospital cardiac arrest. *Resuscitation* 1994;28:195-203
  26. Lund I, Skulberg A. CPR by lay people. *Lancet* 1976;2:702-4
  27. van Hoeyweghen RJ, Bossaert LL, Mullie A, et al. Quality and efficiency of bystander CPR. *Resuscitation* 1993;26:47-52