

# The clinical significance of a failed initial intubation attempt during emergency department resuscitation of out-of-hospital cardiac arrest patients

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## JOURNAL READING

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**Table 1**  
Patient characteristics of study population.

Age, years, median (IQR)	70 (54-79)
Sex, male, no. (%)	311 (60.7)
Witnessed, no. (%)	343 (67.0)
Public place, no. (%)	75 (14.6)
Shockable rhythm, no. (%)	63 (12.4)
Presumed cardiac aetiology, no. (%)	238 (46.5)
Bystander CPR, no. (%)	177 (34.6)
No-flow time, minutes, median (IQR)	6 (0-12)
Prehospital low-flow time, minutes, median (IQR)	16 (9-23)
<b>Prehospital advanced airway<sup>a</sup></b>	
<b>No advanced airway, no. (%)</b>	<b>498 (97.3)</b>
<b>LMA, no. (%)</b>	<b>8 (1.6)</b>
<b>E-tube, no. (%)</b>	<b>1 (0.2)</b>
<b>Unknown, no. (%)</b>	<b>5 (1.0)</b>
<b>Return of spontaneous circulation, no. (%)</b>	<b>293 (57.23)</b>
Survival discharge, no. (%)	50 (9.8)
Good neurologic outcome <sup>b</sup> , no. (%)	24 (4.7)

IQR, interquartile range; CPR, cardiopulmonary resuscitation; LMA, laryngeal mask airway; E-tube, endotracheal tube.

<sup>a</sup> Among the eight patients with prehospital LMA, seven patients were successfully changed to E-tube without any failed attempt at the beginning of ED resuscitation. The patient with prehospital E-tube was first intubated in a private clinic before his cardiac arrest which occurred during his transfer to study ED. He was successfully reintubated after one failed attempt.

<sup>b</sup> Cerebral performance criteria score 1 or 2.

### 1. INTRODUCTION

- Failed initial intubation attempt (FIIA)
- OHCA病人在ED第一次插管失敗率20%~32%
- 目的: 目前並沒有evidence指出, FIIA對ACLS效用的影響, 以及使ROSC更加困難

### 2. MATERIALS AND METHODS

- 韓國一家九百床的醫院, 蒐集2008~2012年大於18歲的非創傷OHCA病人, 共512位
- 急救研究者不知病人的outcome
- FIIA指有第二次或以上的插管
- primary outcome: 達到ROSC的比率.
- Secondary outcomes: 達到ROSC的時間 and 在急診30分達到ROSC的比率

### 3. RESULTS

**Table 2**  
Comparisons between the groups with and without FIIA.

	FIIA (N=77)	No FIIA (N=435)	p
<b>Demographic and prehospital factors</b>			
Age, years, median (IQR)	71 (54-78)	70 (54-79)	0.840
Sex, male, no. (%)	48 (62.3)	263 (60.5)	0.756
Witnessed, no. (%)	49 (63.6)	294 (67.6)	0.497
Public place, no. (%)	11 (14.3)	64 (14.7)	0.922
Shockable rhythm, no. (%)	10 (13.0)	53 (12.2)	0.823
Presumed cardiac aetiology, no. (%)	32 (41.6)	206 (47.4)	0.347
Bystander CPR, no. (%)	28 (36.4)	149 (34.3)	0.720
No-flow time, minutes, median (IQR)	7 (0-16)	6 (0-12)	0.586
Prehospital low-flow time, minutes, median (IQR)	16 (10-22)	16 (9-23)	0.921
<b>Number of failed advanced airway attempt including FIIA</b>			
One failed attempt, no. (%)	62 (80.5)		
Two or more failed attempts, no. (%)	15 (19.5)		
<b>Resuscitation outcomes</b>			
<b>ROSC, no. (%)</b>	<b>39 (49.9)</b>	<b>260 (59.8)</b>	<b>0.006</b>
<b>Time to ROSC in ED, minutes, median (IQR)</b>	<b>12 (10-18)</b>	<b>10 (6-15)</b>	<b>0.053</b>
Time to CPR termination, minutes, median (IQR)	30 (17-34)	30 (22-32)	0.981
Survival discharge, no. (%)	6 (7.8)	44 (10.1)	0.527
Good neurologic outcome, no. (%)	5 (6.5)	19 (4.4)	0.416

FIIA, failed initial intubation attempt; IQR, interquartile range; CPR, cardiopulmonary resuscitation; ROSC, return of spontaneous circulation; ED, emergency department.

### 3. RESULTS

**Table 3**  
Multivariable logistic regression model of ED ROSC achievement.

	Odds ratio (95% CI)	p
<b>Failed initial intubation attempt</b>	<b>0.40 (0.23-0.71)</b>	<b>0.002</b>
Age, per 1 year	1.00 (0.99-1.02)	0.547
Sex, male	0.89 (0.59-1.35)	0.591
<b>Witnessed cardiac arrest</b>	<b>3.78 (2.46-5.79)</b>	<b>&lt;0.001</b>
Public place	1.79 (0.99-3.24)	0.054
<b>Shockable initial rhythm</b>	<b>1.91 (1.01-3.63)</b>	<b>0.047</b>
<b>Presumed cardiac aetiology</b>	<b>0.38 (0.25-0.58)</b>	<b>&lt;0.001</b>
Bystander CPR	1.43 (0.86-2.37)	0.168
No-flow time, per 1 min	0.98 (0.96-1.00)	0.023
<b>Prehospital low-flow time, per 1 min</b>	<b>0.96 (0.94-0.98)</b>	<b>&lt;0.001</b>

ED, emergency department; ROSC, return of spontaneous circulation; OR, odds ratio; CI, confidence interval; CPR, cardiopulmonary resuscitation.

### 3. RESULTS

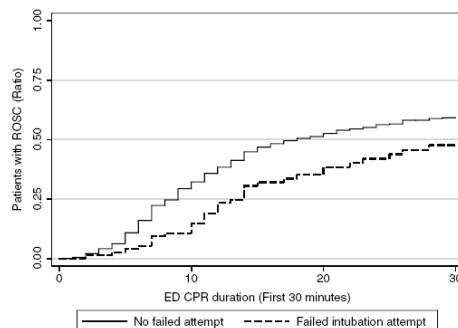


Fig. 1. The unadjusted cumulative incidence of ROSC during the first 30min of resuscitation in the FIIA group (solid line) and the non-FIIA group (dashed line).

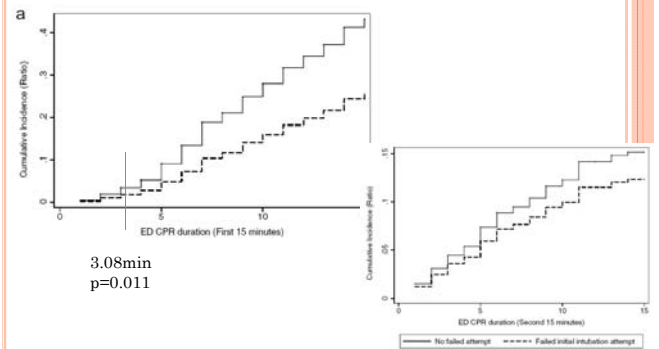
### 3. RESULTS

**Table 4**  
Multivariable competing risk regression models for ROSC incidence rate during first and second 15 min of ED resuscitation.

	First 15 min		Second 15 min	
	Subhazard ratio (95% CI)	p	Subhazard ratio (95% CI)	p
Failed initial intubation attempt	0.52 (0.35-0.79)	0.002	0.80 (0.39-1.65)	0.545
Age, per 1 year	0.99 (0.99-1.00)	0.157	1.01 (0.99-1.02)	0.341
Sex, male	0.87 (0.66-1.14)	0.307	1.09 (0.60-1.96)	0.782
Witnessed cardiac arrest	1.85 (1.32-2.61)	<0.001	3.71 (1.67-8.20)	0.001
Public place	1.55 (1.09-2.21)	0.015	0.94 (0.38-2.30)	0.889
Shockable initial rhythm	1.35 (0.89-2.04)	0.164	1.60 (0.70-3.65)	0.263
Presumed cardiac aetiology	0.57 (0.43-0.76)	<0.001	0.50 (0.27-0.92)	0.026
Bystander CPR	1.16 (0.84-1.61)	0.359	0.99 (0.46-2.13)	0.982
No-flow time, per 1 min	0.98 (0.97-1.00)	0.010	1.00 (0.97-1.02)	0.724
Prehospital low-flow time, per 1 min	0.98 (0.97-0.99)	0.004	0.96 (0.92-1.00)	0.031

ROSC, return of spontaneous circulation; ED, emergency department; CI, confidence interval; CPR, cardiopulmonary resuscitation

### 3. RESULTS



### 4. DISCUSSION

- FIIA的確會影響ACLS的效果, 尤其是在早期的急救
- 之前的retrospective study顯示在prehospital phase做advanced airway management會有壞處, 但在急診則不然
  - 技巧, 人力, 壓胸品質
  - 持續的缺氧狀態會在急診到達臨界值
- 在前15minROSC rate才有差異, 是因插管不管成功與否都是在早期

### 4. DISCUSSION

- FIIA對survival to discharge or a good CPC無顯著差異, 原因可能為過小的樣本數; 或是病因並不單純只是缺少氣體交換造成
- Limitation:
  - Retrospective
  - 由nurse的CPR 紀錄單獲取資料
  - 本身研究方法的誤差
  - 過小的樣本數