

# Cardiopulmonary resuscitation: doctors and nurses expect too much

**ABSTRACT**—Doctors and nurses in the UK and US have an over-optimistic view of patients' chances of surviving an attempt at cardiopulmonary resuscitation (CPR). If medical staff are to follow the recommendation that they should discuss the pros and cons of CPR with patients and their relatives, they should at least be able to give them realistic expectations of survival; otherwise inappropriate decisions may be made. Resuscitation training programmes should routinely include data on survival from CPR in differing circumstances.

In the absence of formal policies for making do-not-resuscitate (DNR) decisions [1,2], health professionals in the UK are being increasingly encouraged to discuss DNR decisions with patients and their families [3–7]. One of the things that such discussion might address is the success rate of cardiopulmonary resuscitation (CPR) and, more specifically, an individual patient's chances of leaving hospital alive following a CPR attempt.

CPR is attempted on 30–50% of those who die in hospital in the US and on about 20% in the UK [8–10]. Only about 10–20% of all those having CPR attempts in acute general hospitals will live to be discharged [11–16].

Discussion with medical staff about chances of survival can influence patients' decisions regarding CPR. Those who are given a realistic view of survival are more likely to decline the procedure [17]. If staff are routinely to discuss this with patients and their relatives, then they themselves should have an accurate knowledge of chances of survival. There have been recent reports that American doctors are over-optimistic about the outcome of CPR [18,19] and we suspected that this was also the case in the UK. We therefore undertook a study of doctors and nurses in the USA and the UK to determine their estimates of survival to discharge from hospital after CPR.

## Method

We distributed a questionnaire by mail to 460 medical and nursing staff at a teaching hospital and affiliated

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**Table 1. Grades of respondents**

Grade	United Kingdom	United States
Consultant/attending physician	18	49
Senior registrar/fellow	9	4
Registrar/resident	20	21
Senior house officer/house officer	61	12
Nursing officer/sister/ nurse coordinator	40	51
Registered nurse	113	71

district general hospital in the UK and 650 staff working in a teaching hospital in the US. Initial non-responders in the UK centres received personal follow-up. Staff working in non-acute areas (eg outpatient clinics) were excluded from the survey as were trainee and auxiliary nurses. In addition to simple demographic details, staff were asked to indicate how many CPR attempts they had ever witnessed or performed and how recently they had seen CPR. They were asked to indicate, on a visual analogue scale, their estimates of:

- the percentage of patients surviving to leave hospital following the CPR attempts which they had personally witnessed
- the national average percentage of survivors after CPR who leave hospital
- the percentage of survivors who leave hospital following CPR attempts initiated on general wards (excluding CCU, ITU, etc).

## Results

In the UK, 261 (57%) responses were received from 108 doctors (physicians, surgeons, 'intensivists') and 153 nurses, and in the US, 208 (32%) questionnaires were returned by 86 doctors and 122 nurses. Their grades of seniority are shown in Table 1. More than half of the British (54%) and 52% of American respondents had witnessed more than 25 resuscitation attempts, and 127 (48.6%) British and 117 (57%) American respondents had witnessed or participated in CPR in the month prior to the study.

The estimates of survival to discharge following CPR which respondents had witnessed, the overall national



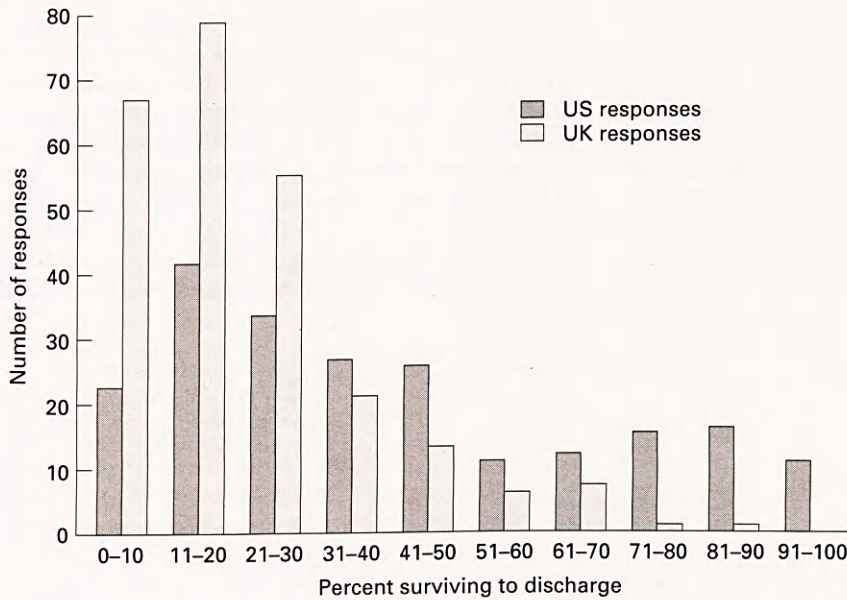


Fig 1. Estimated percentage survival to discharge in CPR personally witnessed (non-responders: US 8, UK 11).

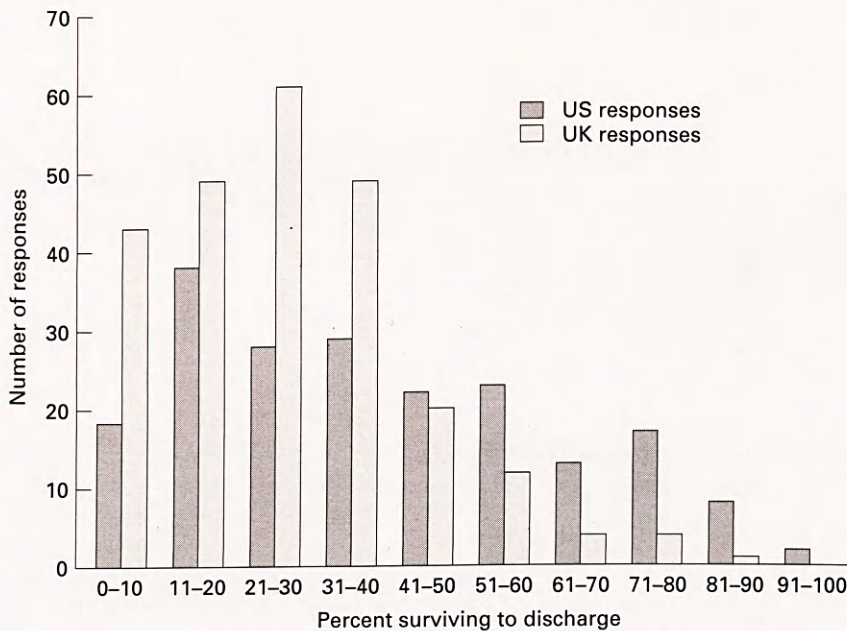


Fig 2. Estimated overall national survival to discharge from CPR in acute general hospitals (non-responders: US 10, UK 18).

average survival rate in acute hospitals and survival from CPR attempts on general wards are given in Figs 1, 2 and 3 and Table 2. The results for doctors who had witnessed or participated in over 25 CPR attempts or who had attended a CPR attempt within the previous months are analysed separately and shown in Table 3. The median estimate was used for comparison as data did not conform to a normal distribution. Comparison between groups was made using  $\chi^2$  for trend.

## Discussion

Survival to discharge from hospital is regarded by most authors as an appropriate outcome measure for CPR [13,14,20,21]. Most deaths following cardiac arrest occur within the first few days [11] but the majority of those who survive to leave hospital will still be alive one year later. In the BRESUS study [13] 17% of patients survived to discharge and 72% of those lived at least a year. Bedell and colleagues [11] found that

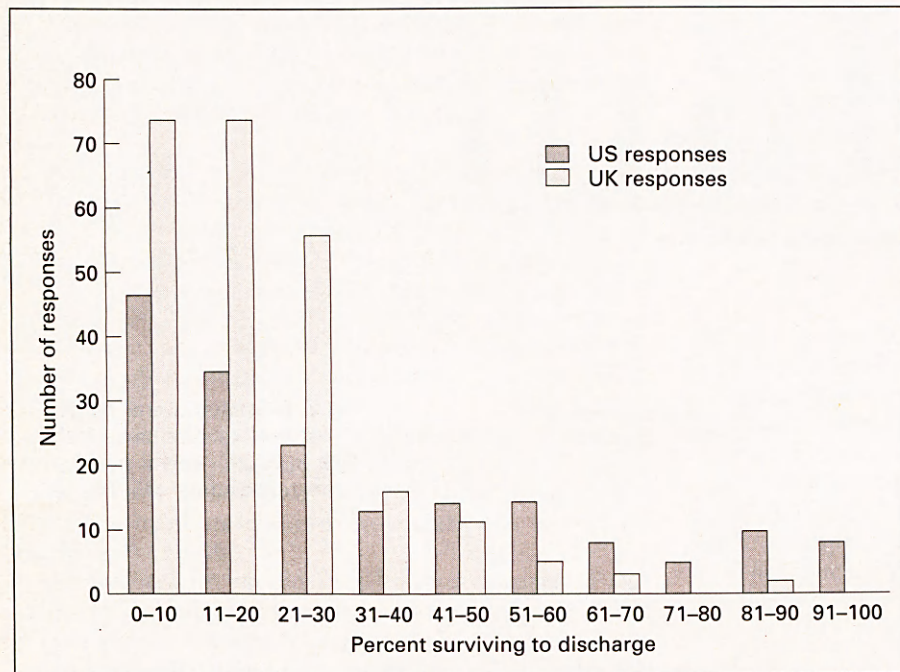


75% of survivors were alive at six months and Tresch *et al* [20] report 86% of elderly and 80% of younger survivors alive one year later. Furthermore, 71% of elderly and 67% of younger survivors lived at least three years [20].

What about the quality of life of CPR survivors? In two studies of elderly patients, few survived CPR but those who did frequently had significant neurological or functional impairment [22,23]. Both these studies included patients who might not have been considered for CPR by many doctors (many had malignancy, severe sepsis or functional impairment before the

cardiac arrest) and so poor outcomes might have been expected. Other reports have been more encouraging. None of the survivors in O'Keefe and colleagues' study had severe neurological dysfunction and 84% were discharged to their own homes [14]. Bedell *et al* [11] found 93% of survivors mentally intact at discharge and Tresch and colleagues [20] reported that survivors showed no significant deterioration in functional status. It seems, therefore, that the majority of those who do survive to be discharged, return from hospital to a normal lifestyle with a good long term prognosis.

In our survey, both doctors' and nurses' estimates of



**Fig 3.** Estimated survival to discharge following CPR attempts initiated on general wards (non-responders: US 25, UK 20).

**Table 2.** Respondents' estimates of survival to discharge following a CPR attempt.

Group	Estimated % survival to discharge from CPR attempts participated in or seen. Range and (median)	Estimated % survival to discharge following a CPR attempt on general wards. Range and (median)	Estimated overall national % survival following a CPR attempt from acute hospitals. Range and (median)
<b>UK population</b>	<b>0-85 (13.5)*</b>	<b>0-85 (18)*</b>	<b>2-88 (21)*</b>
UK doctors	0-85 (17)	0-85 (13)	2-75 (20)
UK nurses	0-73 (21)	0-85 (18.5)	4-88 (32)
<b>US population</b>	<b>0-100 (39.5)*</b>	<b>0-95 (28)*</b>	<b>4-95 (31)*</b>
US doctors	4-80 (20)	0-80 (40)	4-75 (35.5)
US nurses	0-100 (50)	0-100 (50)	10-95 (42.5)

\* Significant difference between groups  $\chi^2$  for trend  $p < 0.001$ .



survival to discharge varied widely, and most overestimated the potential of CPR to achieve survival (Table 2). Staff in the US are significantly more optimistic than their UK counterparts even though similar outcomes are achieved [11].

Personal experience significantly affects expectation of successful CPR [24] and in our study the doctors who had most experience of CPR, or who had recent experience of it were, on average, more accurate in their estimates, although they too overestimated potential for success. Doctors and patients may use this information to help make DNR decisions.

There are a number of problems with this type of study. The low rate of return of questionnaires is likely to be subject to selection bias. However, returns from our postal questionnaire are in keeping with what is expected from this type of survey [25], especially in the USA where we were unable to conduct any follow-up of the initial non-responders. We hope that the reasonable numbers, the spread of specialties and the reported experience of respondents in our survey minimise this. Self-selected experienced respondents would have been expected to be more accurate in their estimates of survival than those less experienced.

We do not have accurate figures for outcome from

CPR in the hospitals surveyed but it is unlikely that they differ significantly from national figures. One Nashville based study, in another hospital, using a pre-arrest morbidity score (PAM) to select patients for resuscitation, reported a 24.6% success rate [26]. Even if respondents in Nashville were aware of this paper, this would not account for the wide range of estimated outcomes.

Our study has shown that doctors and nurses in the UK and the US, even those with considerable recent experience of CPR, have an inaccurate and often over-optimistic view of its potential for success. The degree of confidence (but not competence) among doctors and nurses [27,28] in performing CPR is directly related to the number of cardiac arrests they have attended. We found an inverse relationship between expectation of survival from a CPR attempt and number of arrests attended. There is, however a danger that staff may make inappropriate decisions about CPR based upon their views and experience, or may give an unrealistic impression of likely outcome when discussing DNR decisions with patients.

Resuscitation training programmes should include accurate information on outcome of CPR in various circumstances.

**Table 3. Estimates of survival by most experienced doctors (ie those who had participated in CPR in the last month or who had participated in over 25 attempts).**

Group	Estimated % survival to discharge from CPR attempts participated in or seen. Range and (median)	Estimated % survival to discharge following a CPR attempt on general wards. Range and (median)	Estimated overall national % survival following a CPR attempt from acute hospitals. Range and (median)
<b>UK doctors</b>			
CPR attempt within the previous month ( <i>n</i> = 65)	0-85 (15)	0-85 (11)	0-85 (15)
Over 25 CPR attempts participated in or witnessed ( <i>n</i> = 69)	1-50 (16)	0-47 (12)	2-50 (18)
<b>US doctors</b>			
CPR attempt within the previous month ( <i>n</i> = 62)	4-80 (18)	0-80 (12)	4-75 (18)
Over 25 CPR attempts participated in or witnessed ( <i>n</i> = 67)	4-80 (20)	0-70 (12)	4-75 (18)



## References

- 1 2nd report from the Health Service Ombudsman. *Communications surrounding a decision not to resuscitate a patient*. London: W.258/89-90, HMSO, 1991.
- 2 Calman K. Health Service Commissioner—annual report for 1990-91. Resuscitation policy PL/CMO (91)22. London: DoH, 1992.
- 3 Williams R. The 'Do not resuscitate' decision: guidelines for policy in the adult. *J R Coll Physicians Lond* 1993;**27**:139-46.
- 4 Tomlinson T, Brody H. Ethics and communication in do-not-resuscitate orders. *N Engl J Med* 1988;**318**:43-6.
- 5 Bedell SE, Belbanco TL. Choices about cardiopulmonary resuscitation in the hospital: when do physicians talk to patients? *N Engl J Med* 1984;**310**:1089-93.
- 6 A statement from the British Medical Association and the Royal College of Nursing in association with the Resuscitation Council (UK). *Decisions relating to cardiopulmonary resuscitation*. London: BMA, 1993.
- 7 Liddle J, Gilleard C, Neil A. The views of elderly patients and their relatives on cardiopulmonary resuscitation. *J R Coll Physicians Lond* 1992;**28**:228-30.
- 8 Florin D. 'Do-not-resuscitate' orders; the need for a policy. *J R Coll Physicians Lond* 1993;**27**:135-8.
- 9 Dickinson EJ. Resuscitation of elderly patients. *Geriatrics* 1991;**4**:35-9.
- 10 Keatinge RM. Exclusion from resuscitation. *J R Soc Med* 1989;**92**:402-5.
- 11 Bedell SE, Delbanco TL, Cook FE, Epstein FH. Survival after cardiopulmonary resuscitation in the hospital. *N Engl J Med* 1983;**309**:569-76.
- 12 McGrath RB. In-house cardiopulmonary resuscitation—after a quarter of a century. *Ann Emerg Med* 1987;**16**:1365-8.
- 13 Tunstall-Pedoe H, Bailey L, Chamberlain DA, Marsden AK, *et al*. Survey of 3,765 cardiopulmonary resuscitations in British hospitals (the BRESUS study): methods and overall results. *Br Med J* 1992;**304**:1347-51.
- 14 O'Keefe S, Redahan C, Keane P, Daly K. Age and other determinants of survival after in-hospital cardiopulmonary resuscitation. *Q J Med* 1991;**296**:1005-10.
- 15 Hershey CO, Fisher L. Why outcome of cardiopulmonary resuscitation in general wards is so poor. *Lancet* 1982;**i**:31-4.
- 16 De Bono D. Resuscitation—time for a re-think?. *Q J Med* 1991;**81**:959-60.
- 17 Murphy D J, Burrows D, Sandilli S, Kemp AW, *et al*. The influence of the probability of survival on patients' preferences regarding cardiopulmonary resuscitation. *N Engl J Med* 1994;**330**:545-9.
- 18 Ghush HF, Teasdale TA, Skelly JR. Limiting treatment in nursing homes, knowledge and attitudes among medical directors. *J Am Geriatr Soc* 1993;**41**(Suppl):SA65.
- 19 Miller DL, Gorbien JG, Simbartl LA, Jahnigen DW. Factors influencing physicians in recommending in-hospital cardiopulmonary resuscitation. *Arch Intern Med* 1993;**153**:1999-2003.
- 20 Tresch D, Hendebert G, Kutty K, Ohlert J, *et al*. Cardiopulmonary resuscitation in elderly patients hospitalised in the 1990s: a favourable outcome. *J Am Geriatr Soc* 1994;**42**:137-41.
- 21 Blackhall LJ. Must we always use CPR? *N Engl J Med* 1987;**317**:1281-5.
- 22 Murphy DJ, Murray AM, Robinson BE, Champion EW. Outcomes of cardiopulmonary resuscitation in the elderly. *Ann Int Med* 1989;**111**:199-205.
- 23 Taffet GE, Teasdale TA, Luchi RJ. In hospital cardiopulmonary resuscitation. *JAMA* 1988;**260**:2069-70.
- 24 Varon J, Sternbach GL, Rudd P, Combs AH. Resuscitation attitudes among medical personnel: how much do we really want to be done? *Resuscitation* 1991;**22**:229-35.
- 25 Kelsey JL, Thompson WD, Evans AS. *Methods in observational epidemiology*. New York: Oxford University Press, 1986, pp312-3.
- 26 George AL, Folk BP III, Crecelius PL, Campbell WP. Pre-arrest morbidity and other correlates of survival after in-hospital cardiopulmonary arrest. *Am J Med* 1989;**87**:28-34.
- 27 Marteau TM, Johnston M, Wynne G, Evans TR. Cognitive factors in the explanation of the mismatch between confidence and competence in performing basic life support. *Psychol Hlth* 1989;**3**:173-82.
- 28 Marteau TM, Wynne G, Kaye W, Evans TR. Resuscitation: experience without feedback increases confidence but not skill. *Br Med J* 1990;**300**:849-50.

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