# Old Man's Friend? Resuscitation decisions in patients hospitalised with pneumonia

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## Abstract

**Background** Community-acquired pneumonia (CAP) is a common illness, for which hospitalisation leads to significant inpatient and subsequent mortality. The frequency and timing of discussion of end-of-life issues with these inpatients is therefore relevant.

**Aim** To determine whether end-of-life discussions occurred for patients with CAP whose prognostic indicators suggested a high risk of dying.

**Methods** A retrospective review of 155 admissions with CAP was conducted. The nature and timing of resuscitation decisions were correlated with age, illness severity and mortality.

**Results** Mortality following admission with CAP increases with age and severity. Of those over 65, 37% die within 12 months of discharge; 11% die on the index admission, and a further 26% die in the 12 months following discharge. Mortality increases dramatically with older age: those over 80 had a 47% 12-month mortality. End-of-life decisions were documented prior to death for all inpatient deaths. However, end-of-life decisions were only documented in a minority of other cases, even amongst those with highest risk of subsequent mortality.

**Conclusions** In a common illness with significant mortality, opportunity exists to better identify those at high risk of mortality and initiate discussions about end-of-life care. A not-for-resuscitation discussion currently appears to function as a surrogate marker for impending death rather than an opportunity to elicit a patient's wishes for their care should they be at high risk of dying in the near future.

Community-acquired pneumonia (CAP) is a common illness leading to hospital admission, with over 8000 admissions per year in New Zealand (265 per 100,000).[1] Particularly in the elderly CAP is also associated with significant inpatient and subsequent mortality.[2–4]

Given this risk of death, it is relevant to consider the timing and nature of discussions occurring with patients about their wishes in the event of a life-threatening illness. Such discussion could allow those caring for the patient to better understand their wishes regarding end-of-life care. These discussions have been shown to improve patient satisfaction, the quality of dying, and reduce psychological morbidity in family members.[5]

The growth in the use of Do Not Resuscitate (DNR) orders (also described as Do Not Attempt Resuscitation (DNAR)—the term is used in this study[6]) amongst the elderly without malignancy over recent decades is a worldwide trend, although it is unclear to

what extent this is driven by more explicit medical decision making, or by more actively soliciting patients' wishes.[6]

There are variations between countries in terms of preferences for or against CPR, and whether patients wish to be involved in decisions regarding resuscitation orders.[7,8] These issues are set within a broader context of significant variation between countries in the quality of and access to end-of-life care.[9]

The aim of this study is to determine whether end-of-life discussions occurred in patients with CAP where the risk of death was high on the basis of simple prognostic factors.

## Method

A retrospective audit was conducted of patients discharged from Wellington and Kenepuru Hospitals with a primary diagnosis of CAP. This audit was originally undertaken to assess the impact on the clinical assessment and treatment of patients of the opening of its Medical Assessment Unit in November 2009.[10]

Data was collected on 155 patients presenting January to March 2009 and January to March 2010. Electronic and paper records were reviewed. Data collected included the date of death if a patient died in New Zealand within 12 months of discharge.

This data also included if discussions were had with patients about their wishes in the event of a life threatening deterioration, and if so whether the patient's status was recorded as "For resuscitation" (CPR) or "Do not attempt resuscitation" (DNAR).

The presence of a resuscitation status was correlated with a variety of variables, including age, illness severity and inpatient and 12-month mortality.

Severity of CAP was assessed using the CURB65 score.[11] This is a prospectively validated assessment score of the risk of 30 day mortality. A score of 0 is mild and 5 is severe, with points given for respiratory rate >30, urea >7.4, the presence of confusion, hypotension and age ≥ 65. CURB65 scores were only recorded on 15% of admissions.

A retrospective CURB Age score was therefore calculated for all patients. Where urea was not ordered, a point was given if the patient had an acute rise in creatinine or was clinically assessed as dehydrated, although it is acknowledged this is an imperfect substitute. Confusion was often not documented. This calculated score may therefore understate average CURB scores.

Results are reported below as aggregated data, with "well" being a score of 0 or 1 (corresponding to mild CAP), and "unwell" being a score of 2 or more (corresponding to moderate or severe CAP). One point of the CURB65 score is allocated for age ≥ 65, which therefore confounds comparisons between age and severity.

## Results

Figure 1 shows the inpatient and 12-month mortality by age band and severity at presentation.

Inpatient mortality from pneumonia in those under 65 is rare. All of the 4 patients under 65 who died either during admission or in the subsequent 12 months had significant pre-existing comorbidities: 3 had liver disease and one had end-stage renal failure on dialysis with a prior disabling stroke.

In the 65–79 year old group, the CURB65 score predicted the risk of inpatient but not 12-month mortality. The CURB65 score was modelled to predict 30 day mortality and does not reflect the burden of chronic, comorbid disease. It is therefore not unexpected that its efficacy declines over time.

Total 12-month mortality rose steeply with age and comorbidity. Of the 33 patients dying over 65, many had significant comorbidities: 12 (36%) had extreme frailty or multiple comorbidities, 8 (24%) had cancer, 2 (6%) had underlying lung disease, and 1 (3%) had liver disease.

The presence of a resuscitation order for inpatient death had a sensitivity of 100%, specificity of 68% and positive predictive value of 18%. Presence of a resuscitation order for subsequent death in those surviving at discharge had a sensitivity of 46%, specificity of 74% and positive predictive value of 29%.

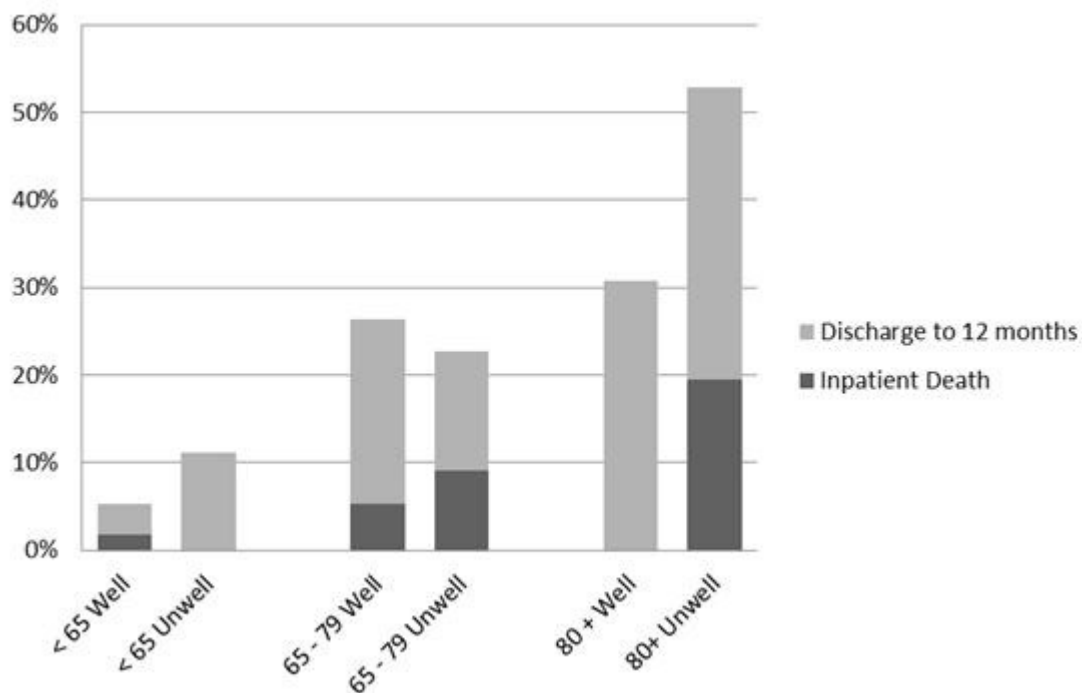**Figure 1. 12-month mortality by age and severity**



Table 1 details patient mortality and frequency of documentation on resuscitation status in the event of arrest (either for CPR, or DNAR).

The frequency of a documented resuscitation decision rose steeply with age, peaking at 51% in patients over 80. This group had at 46% 12-month mortality.

Table 2 details the timing of resuscitation discussions of those who died between admission and 12 months from discharge.

**Table 1. Mortality and documented resuscitation status by age**

| Patient Group | Total | Documented resuscitation decision | Inpatient death | Died after discharge to 12 months | Total 12-month mortality |
|---|---|---|---|---|---|
| **Age <65** | | | | 2 (4%) | 3 (5%) |
| Well | 56 | 14 (25%) | 1 (2%) | 1 (11%) | 1 (11%) |
| Unwell | 9 | 3 (33%) | 0 (0%) | 3 (5%) | 4 (6%) |
| Total | 65 | 17 (26%) | 1 (1%) | | |
| **Age 65–79** | | | | | |
| Well | 19 | 5 (26%) | 1 (5%) | 4 (21%) | 5 (26%) |
| Unwell | 22 | 6 (27%) | 2 (9%) | 3 (13%) | 5 (22%) |
| Total | 41 | 11 (27%) | 3 (7%) | 7 (17%) | 10 (24%) |
| **Age 80 +** | | | | | 4 (30%) |
| Well | 13 | 7 (53%) | 0 (0%) | 4 (30%) | 19 (53%) |
| Unwell | 36 | 18 (50%) | 7 (19%) | 12 (33%) | 23 (46%) |
| Total | 49 | 25 (51%) | 7 (14%) | 16 (32%) | |
| **All cases** | **155** | **53 (34%)** | **11 (7%)** | **26 (17%)** | **37 (24%)** |

**Table 2. Timing of resuscitation decisions in those who died**

| Patient group | Number | Status documented at admission | Status documented later on ward | Status recorded by discharge or inpatient death |
|---|---|---|---|---|
| Died during admission | 11 | 6 (55%) | 5 (45%) | 11 (100%) |
| Died after admission and within 12 months | 26 | 6 (23%) | 6 (23%) | 12 (46%) |
| Total | 37 | 12 (32%) | 11 (30%) | 23 (62%) |

## Discussion

CAP treated as an inpatient is an illness with significant associated mortality in those over 65. Mortality is greatest following discharge. CAP, especially in those over 80 and regardless of its severity, serves as a marker of significant post-discharge mortality. This is consistent with former studies, the largest of which found a 40.9% 1 year mortality in 158,960 patients over 65 hospitalised with CAP.[4]

Discussions about resuscitation status in the event of in-hospital death are a small part of the potential breadth of advance care planning discussions, but are used here as a marker that the clinician considered end-of-life discussions to be appropriate.

Many guidelines recommend advance care planning for those with a life expectancy of less than 1 year,[12, 13] although many physicians report they would not discuss end-of-life options with terminally ill patients who are feeling well.[14] While end-of-life discussions have been commonly recommended in those with malignant disease, their proactive use is increasingly recommended in patients with non-malignant chronic illness or frailty.[15] New Zealand rates well compared to other countries with respect to awareness of end-of-life options.[9]

For all the above patients, approximately one third had discussions or decisions made about resuscitation status at some point during their admission. This is comparable with other studies in CAP.[16]

All those who died as inpatients had resuscitation orders in place – reflecting the generally predictable decline in those who die due to CAP as inpatients. This is consistent with other NZ studies showing end-of-life discussions in the significant majority of people who die in hospital during their terminal admission.[2]

Rates of end-of-life discussion were higher for those at particular risk of death – both the elderly and those with severe CAP. However, even in groups with high post-discharge mortality, end-of-life discussions were only documented in a minority of cases. For example, those who were over 65 and unwell had documented resuscitation statuses in 42% of cases, despite a 12-month mortality in this group of 44%.

This data therefore suggests that the use of a DNAR order in this institution acts more as a surrogate marker for impending death, than as a process of soliciting the views about end-of-life care of those at risk of dying.[17, 18]

There are a number of potential barriers which limit the frequency of these discussions,[19] including the difficulty of choosing the "right" time,[17] over estimating the benefits or CPR,[7, 20] not considering the prognosis of the illness,[18] and the frequent delegation to junior staff.[21] The role of the doctor's faith and ethnicity is also relevant.[22]

Appropriately timed end-of-life discussions require robust prognostic information. Some have argued that attention to prognosis has declined as our ability to diagnose and treat disease has increased.[23] Further, our estimates of prognosis are not always accurate nor communicated to patients.[15]

Evidence is strongly in favour of patients themselves wishing to discuss prognosis,[24] although this is not a universal finding.[25] However, typical illness trajectories can inform decisions about when to discuss end-of-life care and therefore permit a more gradual and considered transition to a palliative approach.[26] This study further demonstrates that simple prognostic markers in a common illness can indicate high mortality, and hence the appropriateness of advanced care planning.

This is a complex situation, given the sensitivity of the issues, the prognostic uncertainty, and the involvement of staff with different levels of clinical and communication skill working under often considerable time pressure.

However, when faced with a possible life-threatening decline, it remains a worthwhile goal that patients and their families would be included in sensitively conducted and well informed discussions in which the patient's wishes were articulated and subsequently respected. Frameworks for such interventions have been developed,[19, 27] and evidence supporting their benefit to patients and their families reported.[5]

This study is limited by its retrospective and single centre nature, and also by documentation that does not always reflect the content of discussions with patients and families.

## Conclusions

CAP carries with it associated significant mortality. Age >80 and illness severity identify patients at over 50% risk of 12-month mortality. Discussions about end-of-life care are in the minority, even in these groups at high risk of death. Currently, resuscitation status appears to serve more as a surrogate marker for a dying patient, rather than a means of ascertaining at-risk patients' wishes in the event of terminal illness. This represents a missed opportunity to ascertain and value patient's preferences for end-of-life care.

Further research is warranted into the barriers to discussions about end-of-life care, and initiatives to better facilitate and frame these discussions..

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