THE DECAF SCORE: A SIMPLE, EFFECTIVE PROGNOSTIC TOOL IN EXACERBATIONS OF COPD REQUIRING HOSPITALIZATION

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Online data supplement

METHODS

Data collection

Table E1 (online). Data collected

Sociodemographic details	Pre-admission status	Admission clinical data
Age	Self-reported annual frequency of AECOPD	Heart rate
Gender	Number of admissions in the previous year	Blood pressure
Residence prior to hospitalisation	Number of previous episodes of assisted ventilation for AECOPD	Respiratory rate
Need for formal social support	eMRCD†	Temperature
Smoking status*	Recent (within 3 months) unintentional weight loss, %	Arterial oxygen saturation
Smoking load (cigarette pack years)	Spirometry (if performed within 2 years)‡	BMI**
	Comorbidity	Purulent sputum expectoration
	Maintenance medications	Acute confusional state
		Cough effectiveness§
		Blood biochemistry$
		Blood haematology£
		Arterial blood gas analysis
		Presence of radiographic consolidation

*current or former (abstinence for at least 3 months) smoker; †extended MRC Dyspnoea Scale; ‡ all patients had documented airflow obstruction on spirometry but only spirometry performed within 2 years of admission was eligible for analysis; ** if not performed during hospital admission and no recent weight loss reported, BMI from recent (within 3 months) clinic visit was accepted; § 'effective cough' = able to cough but could not generate sufficient force to mobilise secretions and fully expectorate sputum, 'ineffective cough' = unable to generate any significant force to their cough; $ serum sodium, urea, potassium, creatinine, glucose and C-reactive protein concentrations; £ haemoglobin concentration, total white cell count, neutrophil leucocyte count, eosinophil count

Table E2 (online) The traditional [1] (MRCD) and extended [2] (eMRCD) versions of the MRC Dyspnoea Scores

Limitation due to breathlessness	MRCD	eMRCD
Breathless only with strenuous exercise	1	
Breathless when hurrying on the level or walking up a slight hill	2	
Walks slower than peers, or stops when walking on the flat at own pace	3	
Stops after walking 100m, or for a few minutes, on the level	4	
Too breathless to leave the house	5	
& independent in washing and / or dressing		**5a**
& dependent in washing and dressing		**5b**

Explanatory notes

- The patient was asked to rate his or her level of breathlessness on a good day within the preceding 3 months, not at the time of assessment.
- A patient only achieves a higher grade if the symptoms are as bad as defined by that higher grade: for example, if symptoms are worse than defined in eMRCD 3, but not as bad as eMRCD 4, the grade remains eMRCD 3
- A key distinction is between eMRCD 4 and eMRCD 5a/5b: the score is 5a or 5b only if the patient cannot leave the house without assistance. For example, if a patient can walk only 30 to 40 yards but can leave the house unaided, the score is eMRCD 4. If a patient can walk only 5 to 10 yards and requires a wheelchair otherwise, the score is eMRCD 5a or 5b.

RESULTS

Table E3 (online) Comparisons between patient characteristics admitted to the two study hospitals

Variable	Hospital 1* (n=505)	Hospital 2* (n=415)
Sociodemographic details,		
Age (years)	73.1 (10.4)	73.1 (9.7)
Female, %	54.5	53.3
Markers of disease severity,		
Number of AECOPD in previous year, median (IQR)	3 (1 to 4)	3 (2 to 4)
FEV_1 % predicted	44.8 (16.7)†	42.1 (17.6)†
MRCD, median (IQR)	4 (3 to 5)	4 (4 to 5)
BMI, kgm^{-2}	24.4 (6.2)	24.7 (6.4)
Events during hospital stay,		
Acidaemic respiratory failure during admission, %	25.3	31.1
Assisted ventilation, %	21.9	21.4
In-hospital mortality, %	10.3%	10.6%

* values quoted are mean (SD) unless otherwise stated; † significant difference between hospitals, p=0.016

Table E4 (online) Independent predictors of in-hospital mortality according to the "full" multivariate regression

Variable	B	S.E.	OR (95% CI)	p value
eMRCD	0.89	0.14	2.43 (1.83 – 3.22)	<0.001
CXR consolidation	1.16	0.28	3.18 (1.86 – 5.47)	<0.001
Eosinophil count, $x10^9$/L	-4.89	1.41	0.008 (0.000 – 0.12)	<0.001
Temperature, °C	-0.51	0.15	0.60 (0.45 – 0.80)	<0.001
Atrial fibrillation	1.01	0.33	2.74 (1.43 – 5.28)	0.003
Ineffective cough	0.97	0.33	2.64 (1.39 – 5.01)	0.003
Age, years	0.04	0.02	1.04 (1.00 – 1.07)	0.026
Cerebrovascular disease	0.68	0.33	1.98 (1.05 – 3.75)	0.035
Albumin, g/L	-0.06	0.03	0.95 (0.90 – 1.00)	0.049
H^+, nmol/L	0.02	0.01	1.02 (1.00 – 1.04)	0.049
Glucose, mmol/L	0.07	0.04	1.08 (1.00 – 1.16)	0.051
Intercept	9.73	5.66		

S.E. – standard error; OR – odds ratio; CI – confidence interval
Nagelkerke's R^2 = 0.428; HLGFT = 0.379. AUROC (95% CI) for in-hospital mortality = 0.90 (0.87 to 0.93)

Odds of dying =

$$e^{\wedge} - [9.73 + (0.89 \times eMRCD) - (0.51 \times temperature) + (0.021 \times Hydrogen\ ions) + (0.036 \times age) - (4.89 \times eosinophil\ count) + (0.68\ if\ cerebrovascular\ disease) + (1.01\ if\ atrial\ fibrillation) + (1.16\ if\ consolidation) + (0.97\ if\ cough\ ineffective) + (0.074 \times glucose) - (0.055 \times albumin)]$$

References (for online supplement)

1. Bestall JC, Paul EA, Garrod R, Garnham R, Jones PW, Wedzicha JA. Usefulness of the Medical Research Council (MRC) dyspnoea scale as a measure of disability in patients with chronic obstructive pulmonary disease. Thorax 1999;**54**(7):581-6.
2. Steer J, Norman EM, Afolabi OA, Gibson GJ, Bourke SC. Dyspnoea severity and pneumonia as predictors of in-hospital mortality and early readmission in acute exacerbations of COPD. Thorax 2012;**67**(2):117-21.