ADMINSTRATIVE MEDICINE

Part I Examination

Tuesday 12 June 2012
17:30 – 19:00 (1½ hours)

Paper IIB

Candidates must answer all parts of this questions

Style, clear grammatical English and legibility will be taken into consideration by the Examiners. Answers should be written in a form appropriate to the audience specified in the question.

Weighting of marks for each part of the question is shown in parenthesis.

DO NOT OPEN PAPER UNTIL THE INVIGILATOR INSTRUCTS YOU TO BEGIN

1. Readmission to hospital for elderly patients is a common problem worldwide. While numerous interventions have been adopted to reduce readmissions, readmissions have not substantially decreased. Describe the factors associated with hospital readmission for the elderly in Hong Kong.

(10 %)

2. While predicting hospital readmission risk is of great interest to those attempting to reduce hospital readmission, using validated models is essential to good management practice. What are the characteristics of a valid risk prediction model such as Hospital Admission Risk Reduction Programme for the Elderly (HARRPE)?

(10 %)

QUESTION CONTINUES

Use the following information below to guide your responses to question 3, 4 and 5.

Amarasingham R, et.al. An Automated Model to Identify Heart Failure Patients at
Risk for 30-Day Readmission or Death Using Electronic Medical Record Data. Med Care 2010:48(11);981-988

Introduction:

A real-time electronic predictive model that identifies hospitalized heart failure (HF) patients at high risk for readmission or death may be valuable to clinicians and hospitals who care for these patients.

Subjects:

An automated predictive model for 30-day readmission and death was derived and validated from clinical and nonclinical risk factors present on admission in 1372 HF hospitalizations to a major urban hospital between January 2007 and August 2008. Data were extracted from an electronic medical record. The performance of the electronic model was compared with mortality and readmission models developed by the Center for Medicaid and Medicare Services (CMS models) and a HF mortality model derived from the Acute Decompensated Heart Failure Registry (ADHERE model)

Main outcome variables:

Death or readmission for any cause within 30 days of discharge. Death was defined as those cases in which a patient died within 30 days of discharge, patients who died

during their hospital stay were excluded from the analysis. Readmission was defined as any re-hospitalisation for any cause to any hospital within 30 days of discharge of a hospital admission for heart failure. Elective readmissions were not counted in this analysis.

Independent variables:

Tabak Mortality Score (severity of illness score), a previously validated score that used automated clinical data to predict risk of in-hospital death served as a measure of clinical illness on admission. Risk of death was determined through the modelling of age, and the worst value obtained in the first 24 hours of hospital presentation for 17 laboratory and vital sign variables (albumin, total bilirubin, creatine kinase, creatinine, sodium, blood urea nitrogen, partial pressure of carbon dioxide, white blood cell count, troponin-I, glucose, internationalised normalised ration, brain natriuretic peptide, pH, temperature, pulse, diastolic blood pressure, and systolic blood pressure). Markers of social, behavioural, risky health behaviours, health care utilisation activity were also included in the analysis.

Statistical analysis and model validation:

The model was validated using a cross validation method. The full sample was split into random derivation and validation subsamples. Using quintile cut points the derivation sample was stratified into 5 risk categories. Kaplan-Meier curves were constructed to test the association between readmission time and the prediction risk.
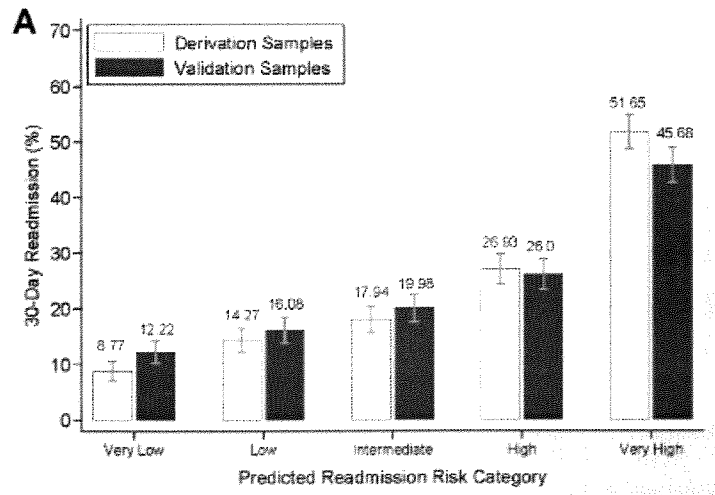
3. Describe and interpret the findings in Table 3.
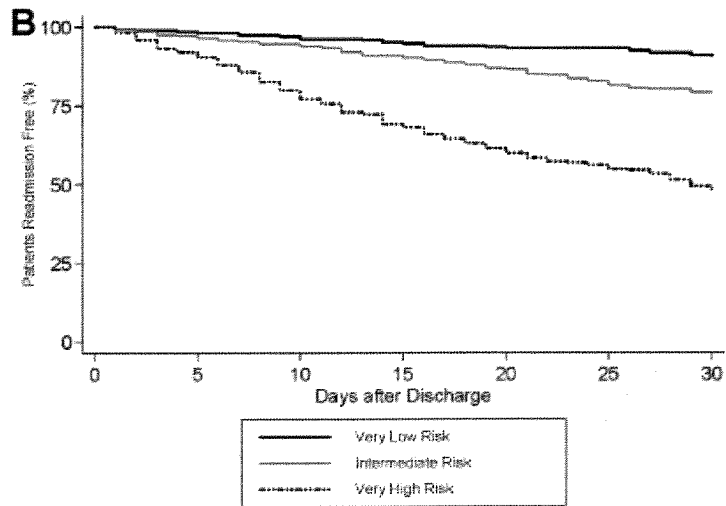
(15 %)

TABLE 3. Multivariate Predictors of 30-Day Readmission for Heart Failure for Electronic Readmissions Model, N = 1372

Variables	Odds Ratio (95% CI)	P
Mortality risk factor		
Tabak mortality score (per 10 point increase)	1.52 (1.31–1.76	<0.001
Readmission risk factors		
Clinical		
History of depression or anxiety	1.44 (1.00–2.07)	0.05
Demographic		
Single	1.47 (1.08–2.01)	0.02
Male	1.37 (1.02–1.84)	0.03
Number of home address changes	1.13 (1.07–1.19)	<0.001
Medicare	1.59 (1.17–2.17)	0.004
Residence census tract in lowest socioeconomic quintile	1.30 (0.98–1.74)	0.08
Health behavior		
History of cocaine use	1.78 (1.17–2.72)	0.01
History of missed clinic visit	1.35 (0.99–1.83)	0.06
Used a health system pharmacy	0.72 (0.51–1.02)	0.08
Utilization patterns		
No. prior inpatient admissions	1.17 (1.07–1.27)	<0.001
Presented to emergency department 6 AM–6 PM for index admission	1.38 (1.05–1.81)	0.02

4 (a). Describe and interpret the findings in Figure A.

(15 %)

A

30-Day Readmission (%)

- Derivation Samples
- Validation Samples

Very Low: 8.77, 12.22
Low: 14.27, 16.08
Intermediate: 17.94, 19.98
High: 26.93, 26.0
Very High: 51.65, 45.68

Predicted Readmission Risk Category

4(b). Describe and interpret the findings in Figure B.

(15 %)

B

Patients Readmission Free (%)

Days after Discharge

- Very Low Risk
- Intermediate Risk
- Very High Risk

5. As the Hospital Authority Chief Informatics Officer write a memo to the Hospital Authority Chief Executive with recommendations regarding the adaptation of the Electronic Medical Record system to support an electronic predictive model for hospital readmissions.

(35 %)

END OF PAPER