SBCCM Tutorial

How to get higher marks in CCM dissertation?

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21 August 2012

- From 1996, CCM Specialty Board member
- From 1997, member + secretary of CCM Board
- From 2009, chairman of CCM Board

- 1st to 26th CCM Assessments, examiner

Specialty Dissertation Projects

- Differences with Publications in renowned journal
  - May be less implication to clinical practice
  - Limited time frame
  - Word count > 5,000

    www.hkcp.org/docs/TrainingGuidelines/HKCP%20GuideBooklet%202011.pdf
  - Critical review /original clinical research acceptable

Dissertation designs

Observational

- Cross sectional
  - Survey
- Longitudinal
  - Prospective: cohort
  - Retrospective: Case control
- Case report
- Case series

Experimental

- Clinical based
  - Clinical trials
- Community based

CCM Dissertations (2006-2012)

- Retrospective case series
  - 31
- Prospective case series
  - 3
- Retrospective case control study
  - 1

Not able to learn

- Experimental
  - Clinical trials
    - Consent
    - Randomization
    - Blinding
    - Sample size calculation
    - Analysis methods

Not able to learn

- Observational
  - Prospective: cohort
    - Exposure (how to measure) and effects
    - Consent issue
    - Follow up
    - More challenging
  - Retrospective: Case control
    - How to select controls
    - Effects of matching

Should convert it to ***a case control study***

- Clinical characteristics and outcomes of critically ill patients with sepsis from the Mainland requiring intensive care admission in a Hong Kong ICU
  - To review the characteristics, outcomes, patterns of infection, and predictors of mortality in critically ill patients with sepsis from the Mainland China
  - One hospital with 86 patients over 2 years

Should convert it to
a case control study

- % of annual admission
- APACHE II & SOFA scores
- ICU & hospital mortality
- ICU & hospital length of stay
- Causes of death
- Types of organisms
- Prognostic factors
  - Smoking
  - Mech. Ventilation
  - Chest infection
  - Higher severity scores

Acceptable case-series

- Clinical Characteristics and Outcomes of Obstetric Patients Requiring Intensive Care Unit (ICU) Admission: A 10-year Retrospective Review
  - I ICU, 10 years, 50 patients
  - Reasons for admission
    - PPH 19 patients
      - Treatment modalities
  - Outcome: mortality
    - Difference from overseas and HK previous data

Case Control Study

- **Characteristics of patients readmitted to intensive care unit: A case-control study**
  - To evaluate the pattern of readmission to intensive care unit (ICU) in a local hospital and identify patients at risk of unplanned ICU readmission
  - 30 months, 146 cases vs. 292 controls
  - Controls matched for age , gender and APACHE IV ROD

Case Control Study

- demographics parameters
- physiological status
- laboratory findings prior to the index admission discharge
- therapeutic options required during the index admission
- immediate cause of readmission

Historic control

- Evaluation of a Protocolized Approach to Sedation Therapy in ICU Patients
  - Prospective cases (n=28, May-Sept 2000) compared with historic controls (n=30, Nov 1999-Apr 2000)
    - Treatment effect
    - Hawthorne effect
    - Period effect

Historic control

- Standardization of intravenous insulin therapy: Quality improvement in blood glucose control using insulin protocol
  - Prospective cases (n=55, Apr-Oct 2006) compared with historic controls (n=55, Nov 2006-Feb 2007)
    - Treatment effect
    - Hawthorne effect
    - Period effect (one in summer, the other in winter)

“Pseudo” cohort studies

- Many so called prospective cohort studies were actually case series
  - A prospective study on critical illness polyneuropathy in patients with prolonged mechanical ventilation and SIRS
  - B-type natriuretic peptide as a prognostic marker of adverse events post-oesophagectomy
  - The Incidence of Deep Vein Thrombosis in Intensive Care Unit in Ethnic Chinese Population

Cohort Study

	Diseased	Not diseased	Total exposure
Exposure	A	B	Total exposed
No exposure	C	D	Total non-exposed
	Total diseased	Total not diseased	

Relative risk: [A/(A+B)] / [C/(C+D)]

Try to get more from a case-series

- Outcomes of Acute Renal Failure Patients Having Received Renal Replacement Therapy in the Intensive Care Unit
  - Mortality rate, prognostic factors (MV, HRS, SAPS II score, ..etc)
  - Aim at comparing intermittent RRT vs. continuous RRT (adjusted disease severity)

Try to get more from a case-series

- **Study of Tracheostomized Patients in Intensive Care Unit**
  - to describe the short-term and long-term outcomes of tracheostomized ICU patients
  - to identify any predictors of complications during and after the tracheostomy procedure
    - Surgical (Open) vs. percutaneous tracheostomy

Problem of sample size

Adequacy of searching

- Inadequate searching for records
- Should be extensive (admission books, OT records, Lab. Records and CDARS)
- Rather than just CDARS only
  - Because of inadequate coding or
  - Multiple keywords search

Inadequate sample size

- Type II error (β error)
- The most important problem in dissertation
- Sometime the difference is obvious >30% !
  - Not statistically different because of small sample size

Not independent samples

- A two year survey on bloodstream infection in an ICU: incidence, mortality outcome and risk factors
  - 116/726 blood cultures +
  - 82/116 significant bacteremia
  - 75/82 clinical relevant BSI episodes
  - 72 patients involved in these 75 episodes

Not independent samples

- A two year survey on bloodstream infection in an ICU: incidence, mortality outcome and risk factors
- If based on 75 episodes
  - Demographics
  - Outcomes, ICU, 28-days and hospital mortalities
  - Risk factors for mortality
- Wrong conclusions

Not independent samples

- Similarly
- 1 patient with two eyes, two limbs, …
- 1 patient with multiple CABSI, VAP, …
- 1 patient with multiple hemo-catheters

Selection bias

- The use of Renal Resistive Index and NGAL in prediction of acute kidney injury (AKI) in ICU patients with septic shock
  - Aug 2010 to Jan 2011 (6 months)
  - 30 patients with septic shock were recruited
    - 18 with AKI and 12 with no AKI
  - Did not specify how they select these 30 patients

Unclear definition of terms used

- A study of necrotising fasciitis patients admitted to three local ICUs
- Operation time (hours)
  - Duration of operation or
  - Time from hospital admission to operation or
  - Time from ICU admission to operation?

Alternative explanation

- A study of necrotising fasciitis patients admitted to three local ICUs
- No. of debridement for
  - Survivors: 3
  - Non-survivors: 1
  - → Non-survivors not adequate debridement or
  - → Non-survivors died too soon to receive more!

PPV &NPV is prevalence dependent

- Can’t use positive or negative predictive values to determine accuracy of a test
  - Dependent on sensitivity and specificity and
  - Prevalence of the condition in the study sample
  - Bayes’theorem

Inappropriate use of mean values

- WBC count (10^9/L)
  - Survivors: 15.0
  - Non-survivors: 9.5
  - → non-survivors had normal WBC count
  - The apparent normal mean in non-survivors may be due to the presence of extreme leucopenia and leucocytosis in non-survivors
- Also in other lab parameters

Parametric vs. non-parametric tests

- Expression of continuous variables
  - Mean ± SD for normally distributed variables
  - Median ± IQR for otherwise
- Inappropriate use of parametric tests
  - Test the normality before use, scale transformation

Missing data in drawing tables

- A retrospective study of clinical characteristics and outcomes of obstetric patients with pre-eclampsia or eclampsia who required Intensive Care in a regional hospital of Hong Kong

Table VIII. Independent factors associated with eclampsia:

Emergency admission Yes No	χ= 0.07	NS
Primgravida Yes No	χ = 0.83	NS
Age 31 or less 32 or above	χ = 0.02	Significant
Chinese Yes No	χ = 0.51	NS
Hong Kong resident Yes No	χ = 0.07	NS
Antenatal follow up in HK Yes No	χ = 0.16	NS
Urine dipstix Negative or "trace" One plus or above	χ = 0.27	NS
Proteinuria Below 3gm/day Above 3gm/day	χ = 0.318	NS
Weeks of gestation Less than 34 34 or above	χ = 0.005	Significant
Multiple gestation Yes No	χ = 0.26	NS
Passive smoking Yes No	χ = 0.19	NS
Maternal medical history Yes No	χ = 0.11	NS

NS = Not significant

- A study of necrotising fasciitis patients admitted to three local ICUs

Table 6

	No. of Patients [n]	Hospital Nonsuvivors [n(%)]	*p* Value	ICU Nonsurvivors [n(%)]	*p* Value
All Patients	90	42(46.7)		31(34.4)	
Comorbidities					
Diabetes mellitus	33	19(57.6)	0.130	14(42.4)	0.255
Chronic hepatitis	20	11(55)	0.452	8(40)	0.599
Cirrhosis	13	9(69.2)	0.131	6(46.2)	0.358
Cardiovascular disease	9	6(66.7)	0.295	5(55.6)	0.266
Chronic kidney disease	8	4(50)	1.000	3(37.5)	1.000
Malignancy	6	3(50)	1.000	1(16.7)	0.660
Immunosuppressant	3	2(66.7)	0.681	0(0)	0.090
Type of growth					
Tissue growth	86	40(46.5)	1.000	30(34.9)	1.000
Blood growth	20	14(70)	**<0.05**	11(55)	**<0.05**
Operation					
Debridement ≥ 3	37	7(18.9)	**<0.05**	4(10.8)	**<0.05**
Operation ≤ 24 hours	61	21(34.4)	**<0.05**	15(24.6)	**<0.05**
Critical care support					
Inotropes	81	41(50.6)	**<0.05**	31(38.3)	**<0.05**
Dialysis	30	21(70)	**<0.05**	17(56.7)	**<0.05**
Complications					
DIC	78	41(52.6)	**<0.05**	31(39.7)	**<0.05**
AMI	22	14(63.6)	0.087	9(40.9)	0.606
Rhabdomyolysis	2	2(100)	0.215	1(50)	1.000
ARDS	6	5(83.3)	0.094	5(83.3)	**<0.05**
Acute kidney failure	22	19(86.4)	**<0.05**	15(68.2)	**<0.05**

Statistical significance expression

- It is always better to state the exact p value (2 or 3 decimals) rather than $p < 0.05$

- Better to specify the 95% Confidence Interval

Comparison with other study

- Use the same scale
- Australia data
  - Mean ICU LOS 11 days
  - Mean hospital LOS 36 days
- Hong Kong data
  - Median ICU LOS 9 days
  - Median hospital LOS 23.5 days!

Collinearity in regression

- Too many highly correlated parameters are put into the model building by logistic regression (e.g. in determining independent risk factors)
  - APACHE II score, age, MV, RRT, vasopressor use, …
  - Different statistical methods may generate different parameters as “independent” risk factors

Unsupported conclusion

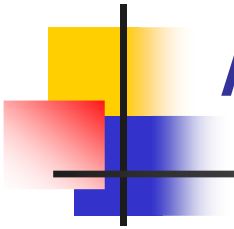
- The conclusion drawn was not supported by the study findings

Avant-gardes

- Anything new and unusual in the subject, study methods, analysis methods, presentation methods
- Explain in details and better quote some references for examiners
- Einstein theory of relativity was not appreciated at the beginning

Avant-gardes

- B-type natriuretic peptide (BNP) as a prognostic marker of adverse events post-oesophagectomy
  - BNP – a marker of heart failure
  - Why suddenly use it in this setting
  - Should explain very clearly why you have such postulation, literature review is important
  - Examiner is not perfect in all aspects



Avant-gardes

- **Characteristics of patients readmitted to intensive care unit: A case-control study**
- Tree analysis was used
  - allowed a better delineation of relationship among these highly correlated risk factors

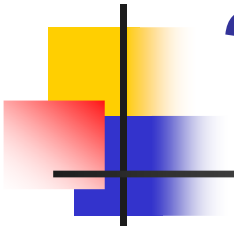
Read coded references

- Coding reference
  - Make sure you have read the article or at least its abstract
  - We will spot check the article whether it is really the case

Ethics Committee Approval

- All prospective studies, especially those involving interventions on patients must have ethics committee approval prior to starting!
  - No matter it is invasive or non-invasive

Can be fatal !



? Plagiarism

- A short paragraph was almost copied from an article
- Failure to include quotation/give appropriate citation
- Moral offence
- Liable for copyright infringement
- Plagiarism detection

Topic selected

- Should be thoroughly studied
- Or even better experienced it before
  - E.g. HBO treatment for CO poisoning

Discussion

- Should be “Critical review”
  - Indicate your belief
  - Evidence to support
  - Pros and Cons, …
- Not just a narrative review

Dissertation

4.1 In the beginning of the final year of training or earlier, the trainee will be asked to prepare a dissertation of not less than 5, 000 words on a topic in the specialty, to be submitted to the Assessment Board through the supervisor not later than two months before the assessment date. The primary objective is to develop in the trainee the ability to critically apply his/her knowledge to specialist practice. The dissertation may be in the form of a critical review of the literature on relevant topics, or original clinical research based on work carried out in the training unit. (See Appendix 2 of *Guidelines* on *writing and assessing a Dissertation*)

3 August 2012

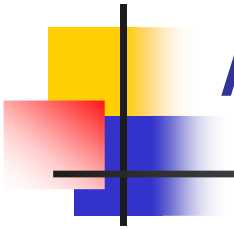
Dr Yan Wing Wa
Chairman
Specialty Board in Critical Care Medicine

Dear Dr Yan

Writing of dissertations

At its 250th Meeting of 17 July 2012, the Council noted that some candidates and even some Specialty Boards still have misconceptions about the writing of dissertations, to the effect that an original study is always expected from them and is much better than a critical review on a clinical topic.

In this context, the Council has noted that many trainees have embarked on studies with weak methodology and thus disappointing results. The Council has thus directed me to remind you that a good quality review is preferable to a poorly designed study or a study with methodological problems. Please disseminate this message to your Trainers and trainees.



Advice

- Start earlier
- Careful planning before start
- Consult experts/seniors
- Proof read by as many colleagues as possible
  - Allow ample time for them

Questions or Comments?