University of Medicine and Pharmacy
“Iuliu Haţieganu”
Cluj-Napoca
Faculty of Medicine

Anca Dana BUZOIANU
Sorin Claudiu MAN
Carmen Mihaela MIHU
Daniel MUREȘAN
Dana POP
Șoimița Mihaela SUCIU

WRITING THE LICENSE THESIS

Students’ Guide

2017

General aspects

The license thesis is an essential element for the evaluation of student's activity. It determines the student's abilities to plan and create independent research, but also to write the research paper according to the rules of the scientific community.

This guide for writing the license thesis has been designed by taking into account the following objectives:

- Improving of all activities related to the coordination of the license thesis.
- To facilitate the student's correct writing of the thesis
- To increase the quality of the license thesis
- The uniform assessment of the graduates who sustain their license thesis

The license thesis will include a signed and dated affidavit stating that the paper belongs to the graduate, that it has never been presented as a license thesis and that it hasn't been plagiarized (please consult the rules to avoid plagiarism at http://www.indiana.edu/%7Ewts/pamphlets/plagiarism.shtml)

Editing rules

- The license thesis (excepting the bibliography) will consist of 40-60 pages in an **ISO B5 format** (176 x 250 mm);
- It will be edited in 11p Arial and 1.5 spacing;
- There will be used diacritical marks specific to the language the paper has been written in;
- The paragraphs will be aligned to the left and right (justified);
- Pages will be numbered beginning with the title page to the last page of the paper but they will show their number starting only with the "Table of Contents" page; the page number will be inserted at the bottom of the page (centered or to the right);

- Large chapters (“General Review” and “Special Review”) always start on a new page
- The license thesis will be printed only on one side of the paper.

The structure of the license thesis

The license thesis is structured into chapters and it includes the following compulsory elements:

Cover (please find a specimen on the next page)

Title page (please find a specimen on the next page)

Contents

- The license thesis will have a table of contents that should contain at least all the titles of the chapters as well as the number of the page where the chapter begins

General review

- It is a general narrative review about the subject of study comprising:
    - The importance of the chosen subject
    - The current state of research in this field (compilation, interpretation and critical evaluation of the studies; do not describe all studies related to the subject as some of them might not have scientific value)
    - Problems that are still unsolved (controversies about the subject)
    - Summary of the presented data
- it is important to use figures and tables to explain and summarize the data

Special review

- The special review can be written as a **primary study** (observational, experimental or interventional original research) or as a **secondary study** (a *systematic review* of a primary studies)

Chapter span within the thesis

Title page		
Contents		
General review (narrative review)		**~ 50%**
Special review (original research)		**~ 50%**
Introduction	~ 5%	of the original research
Materials and methods	15 – 25%	
Results	40 – 50%	
Discussion	20 – 30%	
Conclusions	~ 5%	
Bibliography		

(Cover and title page specimen)

University of Medicine and Pharmacy
"Iuliu Haţieganu"
Cluj-Napoca
Faculty of Medicine

LICENSE THESIS

Adrenaline Therapy for Acute Bronchiolitis in Children

Coordinator:
Conf. Dr. Ion POPESCU

Graduate:
Mihai MARIAN

2013

Writing the license thesis as a primary study

- It has the structure of an original, primary study that can be observational, experimental or interventional;

Introduction

- The ”Introduction” chapter must contain:
    - The subject and its importance (the *known* and the *unknown* aspects of the subject); this information will be presented in short, with a few recent bibliographical references; it has been presented in detail in the general review of the thesis;
    - The *study rationale* (it must convince the reader that the study was necessary): the reason why it is important to study that particular aspect;
    - The *study objectives* (explicitly explained): the problem which is studied or the hypothesis which is tested.
- The results of the current study cannot be presented in ”Introduction”;
- It must not overlap on the chapter "Discussion".

Material and methods

- The purpose of this chapter is to describe how the results were obtained;
- This chapter should provide sufficient details to allow a repetition of the study by other authors;
- Few bibliographical references are used in this chapter;
- It must contain:
    - *What type of study* was carried out to achieve the objectives (the study design): retrospective, prospective, cohort, case-control, randomized study a.s.o.;
    - *Location of the study*
    - *Participants to the study*

- The method and the location for selecting the participants (pacients or lab animals): criteria for inclusion in and exclusion of the study; explanation of the criteria;
- Identification of age, sex and other relevant characteristics of the participants;
- The method for collecting data (from patients charts,…)

- *Methods*
  - Presentation of all the methods used so that other authors can repeat the study;
  - Describe methods only for which results are presented;
  - Methods are presented logically, not chronologically (Sometimes logical order overlap on the chronological order)
  - Well-known methods are only mentioned (including bibliographical references);
  - Less-known methods are described briefly;
  - Original methods are described in detail (new equipment, completely new or substantially improved laboratory method);
  - Description of the equipment that is used (name of the equipment, name and adress of the manufacturer);
  - Precise identification of drugs and other chemical substances used in the study (common international name, trade name, manufacturer‘s name and address);
  - Clear description of the intervention or of the factor that is studied (therapeutic method, …);
  - Description of the factors that are monitored;
- *Statistical review*
  - How it was calculated the necessary number of cases;
  - Indication of the statistical tests used (Student, ANOVA, …) and how every test was chosen (e.g., according to the data distribution,…);

- If a computer program was used for statistical calculations, the name and version of the software must be mentioned, but also the statistical test; therefore a phrase like "*we have analysed the results using Easistat [Alrincham, UK]*" is not enough;
- The chosen p-level is mentioned ("differences were considered significant if $p<0.05$"; a different level may be chosen as well: $p<0.01$);

Results

- Only results obtained by using the methods described in the chapter "Material and methods" are presented, and which are relevant to the study objectives:
  - The basal data of the study groups and the recruitment period;
  - The main and secondary results;
  - The adverse reactions to the studied intervention (even if this was not the goal of the current study);
  - Death cases occurred during the period of study.
- The results will be presented in the text *or* as a figure *or* as a table (therefore data presented as diagram or table WILL NOT be repeated in the text); relevant results are emphasized in the text (details are presented in the tables and figures).
- In this chapter: DO NOT discuss results, DO NOT make interpretations; DO NOT state opinions, DO NOT compare your own results with those presented in literature.
- This chapter does not include bibliographical references.

What a figure should contain

- Numbered sequence according to the text quotation, title, naming of the "x" and "y" axes, measurement units, values;
- DO NOT present too much information on the same figure;

- Statistically significant differences must be marked (with *);
- Abbreviations used must be defined (even if they have been used and explained within the text);
- The figure must be cited in the text (e.g., *"The correlation between respiratory resistance and vital capacity is presented in figure 1."*).

Figure specimen

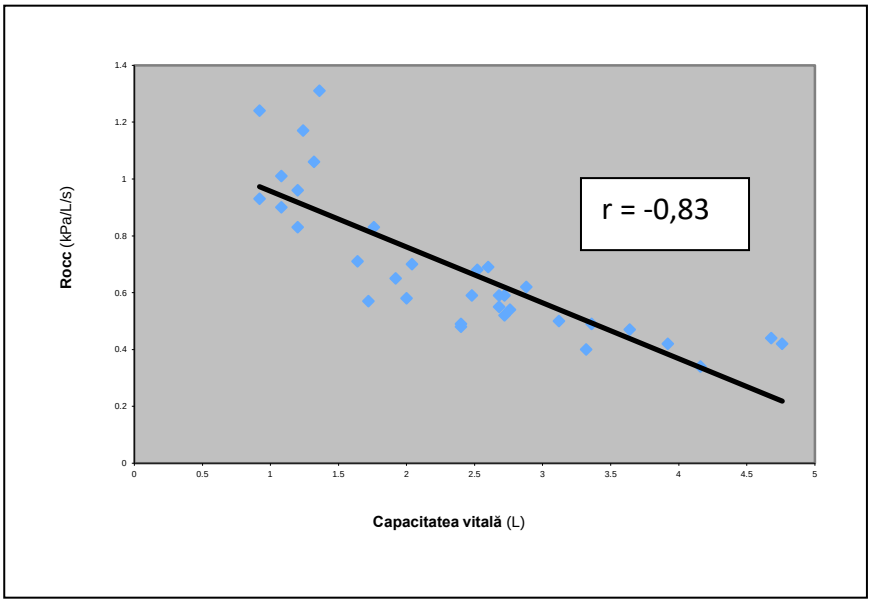


Figure 1. The correlation between respiratory resistance and vital capacity (Rocc)

What to include in a table

- Numbered sequence according to the text quotation, title, names of the columns, measurement units, abbreviations explained in the footnotes (not in the title), explanation of the results expression (e.g., mean ± standard deviation);
- Vertical lines should be avoided (only horizontal lines should be used);
- The important comparisons should be made from left to right (not from top-to-bottom).

Table specimen

Table 1. Basic features of the studied groups[a]

	Adrenaline (n = 23)	Placebo (n = 29)	p
Age (months)	5.1 ± 3.7	6.1 ± 5.4	0.673
Weight (kg)	6.8 ± 1.9	7.2 ± 2.4	0.759
Wheezing duration (days)	2.3 ± 1.5	2.9 ± 1.9	0.930
Respiratory rate (/min)	48 ± 9	50 ± 13	0.302
Heart rate (/min)	161 ± 16	156 ± 22	0.537
SaO_2 (%)	91.4 ± 3.9	91.9 ± 2.5	0.947

[a] mean ± standard deviation

Discussion

- The “Discussion” chapter is a dialogue with the reader interested in the study; answers are given to any question the reader might ask;
- Do not repeat the detail data presented in the chapters “Introduction” or “Results”
- This chapter must contain the following aspects, in this order:
    - The main result of the study (the answer to the main objective of the study);

- The comparison between the current results and those of other similar studies; explanation of the different results as compared to similar studies; support for your own results compared with those of other studies (explanations such as: “different methods were used”, …);
- Study strengths (emphasize the new and important aspects of the study);
- Study limitations (limitations of the study design, used methods, statistical tests used, patients lost on follow-up,…) and the effects of these limitations on the results;
- Interpretation of the results, critical evaluation and explanation of the results (especially the unexpected ones);
- Practical (clinical) implications of the results;
- Suggestions for future studies (future directions of research);

- It is not necessary to mention all these aspects;

Conclusions

- They have to be written briefly, one by one;
- There must be presented only conclusions derived from your own results obtained in the current research;
- DO NOT draw conclusions from the literature;

Writing the license thesis as a Systematic review

Definition – systematic review

A **systematic review** is a literature review focused on a research question that tries to identify, appraise, select and summarize all research evidence relevant to that question.

In contrast to other approaches to reviewing the literature, systematic reviews use a well-defined and uniform approach to identify all relevant studies and display the results of selected studies.

Definition – meta-analysis

Meta-analysis is the use of statistical methods to summarize the results of a systematic review.

The statistical aspects can be: calculating summary effect estimates and variance, statistical tests of heterogeneity, and statistical estimates of publication bias. Many, but not all, systematic reviews contain meta-analyses. By combining information from all relevant studies, meta-analyses can provide more precise estimates of the effects of health care than those derived from the individual studies included within a review. While many systematic reviews are based on an explicit quantitative meta-analysis of available data, there are also qualitative reviews which adhere to the standards for gathering, analyzing and reporting evidence.

General comments

A systematic review is not a narrative review. A systematic review aims to provide an exhaustive summary of literature relevant to a research question. Systematic reviews of high-quality randomized controlled trials are crucial to evidence-based medicine. An understanding of systematic reviews and how to implement them in practice is becoming mandatory for all professionals involved in the delivery of health care. Systematic reviews also help to identify knowledge gaps and need for additional research.

Systematic reviews may concern treatments, clinical tests, public health interventions, social interventions, adverse effects, and economic evaluations.

A good systematic review, like any other study, requires a complete written protocol before the study begins.

Chapters and steps for preparing and writing a systematic review

INTRODUCTION

In the"Introduction" chapter the student should include the following headings:

- Description of the condition;
- Description of the intervention;
- What is already known about the condition/intervention?;
- What is not known about the condition/intervention?;
- How the intervention might work;
- Why it is important to do this review.

Claims or statements regarding aspects such as disease burden, morbidity, prevalence and mechanisms of action should be supported by scientific evidence.

OBJECTIVES

1. Defining the research question

Formulating a well-focused research question is the first and one of the most important steps in writing a systematic review. Without a well-focused research question, it can be very difficult and time consuming to identify appropriate resources and search for relevant evidence. The literature also reports that many clinical questions go unanswered due to difficulties formulating a relevant research question and lack of skills in searching.

Practitioners often use a specialized framework, called **PICO**, to form the question and facilitate the literature search. PICO stands for **P**atient problem, **I**ntervention, **C**omparison, and **O**utcome. The PICO framework can

be expanded to PICOTT, adding information about the **T**ype of question being asked (therapy, diagnosis, prognosis, harm, etc.) and the best **T**ype of study design (randomised controlled study, etc.) for that particular question. Using this framework facilitates the searching process by identifying the key concepts for an effective search strategy, because questions with at least a defined intervention (**I**) and a defined outcome (**O**) were more likely to be answered than questions with one or none of these parameters.

When possible, state the main objective in a single concise sentence. Wording should resemble the following "to assess the effects of [*the intervention* or *the comparison*] for [*the health problem*] in [*types of people*]".

Examples of research questions:

"The aim of this study is to provide a systematic review of the current evidence for the efficacy of antibiotics in the treatment of acute rhinosinusitis in children."

"To evaluate the effectiveness of leukotriene receptor antagonist (LTRA) in treating children with prolonged non-specific cough."

METHODS

2. Definition of inclusion and exclusion criteria for studies

The protocol for a systematic review should state *a priori* clear criteria for including and excluding studies. Give rationale for those inclusion/exclusion criteria. Criteria typically designate:

- the population that is acceptable for study,
- the disease or condition of interest,
- the intervention to be studied,
- acceptable control groups (comparator: placebo or other intervention),
- required outcomes,
- type of study,

- others (maximal acceptable loss to follow-up, minimal acceptable length of follow-up, the period during which studies were published,)

3. Searching for studies

Systematic reviews are based on a comprehensive and unbiased search for studies. The search should follow a well-defined strategy established before the results of the individual studies are known. The process of identifying studies for potential inclusion in the review and the sources for finding such articles should be explicitly described before the study. Ideally, searches should not be limited to MEDLINE; other electronic databases such as Web of Science, AIDSLINE, CANCERLIT, and EMBASE can be included, as well as manual review of the bibliography of relevant published papers. The search strategy should be presented in detail (databases included, key words, limits used, date of last search,…).

Examples of search

”We searched Medline, Embase and the Cochrane controlled trials register up to October 2011 using the terms sinusitis, paranasal, rhinosinusitis, purulent, rhinorrhea, sinus infection, randomised, randomised control trial, double blind method, random allocation, placebo, antibiotic, antimicrobial, animal, human, child, children and adolescent. No restriction was made based on language.”

”The Cochrane Register of Controlled Trials (CENTRAL), the Cochrane Airways Group Specialised Register, MEDLINE and EMBASE databases were searched. The following topic search strategy was used to identify the relevant randomised controlled trials listed on the electronic databases: “cough” OR “bronchitis”, all as (textword) or (MeSH) AND “leukotriene receptor” OR “leukotrienes” OR “montelukast” OR “LTRA” OR “zafirlukast”, OR “pranlukast”; all as (textword) or (MeSH).”

4. Selecting studies

Once criteria for inclusion/excusion are established, each potentially eligible study should be reviewed for eligibility. So, each identified article is checked against pre-determined criteria for eligibility (the inclusion criteria). The systematic review should list studies that were considered for inclusion and the specific reason for excluding a study. For example, if 25 potentially eligible trials are identified, these 25 trials should be fully referenced and a reason should be given for each exclusion.

5. Collecting data from studies

Data should be abstracted from each study in a uniform and unbiased fashion. Generally, this is done by using predesigned forms that include variables that define:

- eligibility criteria,
- design features,
- the population included in the study,
- the number of individuals in each group,
- the intervention (for trials),
- the main outcome,
- secondary outcomes, and
- outcomes in subgroups.

The data abstraction forms should include any data that will subsequently appear in the text, tables or figures describing the studies included in the systematic review, or in tables or figures presenting the outcomes. The process for abstracting data from studies for the systematic review should be clearly described in the thesis.

6. Analysing data

When planning a systematic review it is advisable to mention the formulation of the effect under analysis. The manner of communication for the results may be different from the one in the primary study.

For Binary data, most frequently the effect is presented as relative risk, odds ratio and risk difference. For continuous data, the effect is presented as mean value difference.

Example:

"Relative risk of mortality reduction was the primary measure of treatment effect."

"The primary outcome measure was the mean difference of means".

RESULTS

7. Presenting results

Study selection

- Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.

Flow of studies

- Provide information on the flow of studies from the number(s) of references identified in the search to the number of studies included in the review, ideally using a flow chart.

Excluded studies

- List key excluded studies and provide justification for each exclusion.
- The table of 'Characteristics of excluded studies' is not a comprehensive list of studies that were identified but not included.

• List here any studies that a user might reasonably expect to find in the review to explain why it is excluded.

Study characteristics

• Important characteristics of each study included in the systematic review are presented clearly in table(s): ”**Characteristics of included studies**”. These often include:

- **Methods**: the basic study design or design features (e.g. parallel group randomized trial, case-control study, etc.), even if the review is restricted to one study design. *(”Multicenter, randomized, placebo-controlled, double-blind, double-dummy parallel trial”);*
- **Participants**: characteristics of the population studied, the study sample size. *(”63 children aged 2-5 years with asthma-like symptoms were included.”);*
- **Interventions**: the intervention and the comparison intervention; *(”Fluticasone 100 µg twice daily via metered dose inhaler and a spacer, Montelukast 4 mg daily or placebo for 3 months.”);*
- **Length of follow-up**;
- **Outcome(s)** *(”The primary outcome was the daily symptom score as recorded by caregivers”).*

Effects of interventions

• display the results of the individual studies (risk estimates, confidence intervals or ”p” values) in tables or figures; accompany all effect size estimates with a measure of statistical uncertainty (e.g. a confidence interval with a specified level of confidence such as 95%); if reporting P values, provide exact P values (e.g. P = 0.08 rather than P > 0.05).

DISCUSSION

Five standard headings are included in this chapter:

• Summary of main results;

- Applicability of evidence;
- Quality of the evidence (limitations of studies);
- Limitations in the retrieval process of studies (e.g., incomplete retrieval of identified research, …);
- Agreements and disagreements with other studies or systematic reviews.

CONCLUSIONS

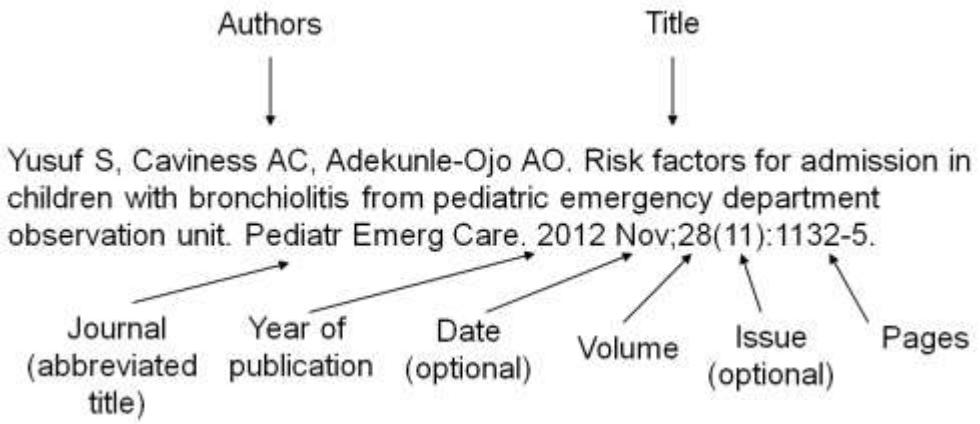
- Provide a general interpretation of the results;
- State implications for practice;
- Give implications for future research: what studies should be done in the future (population, intervention comparison, outcome, and type of study).

Writing the bibliography

- Bibliographical entries will be numbered and presented in the order of their occurrence in the text;
- The reference list will only comprise titles directly accessed and used in the paper; all bibliographical titles must be quoted in the text;
- References editing must comply with the *National Library of Medicine's Citing Medicine* standard (Citing Medicine, 2nd edition. The NLM Style Guide for Authors, Editors, and Publishers) available at: http://www.ncbi.nlm.nih.gov/books/NBK7256/?amp=&depth=2
- Specimens of bibliographical notes editing may be found at: http://www.nlm.nih.gov/bsd/uniform_requirements.html
- In the case of 6 or less then 6 authors: all 6 should be cited
- In the case of more than 6 authors: the first 6 are cited followed by "et al".

EXAMPLES:

1) Journal article



The publication date and number may be left out if the journal has a continuous page layout for the whole volume (which is customary with most journals).

Halpern SD, Ubel PA, Caplan AL. Solid-organ transplantation in HIV-infected patients. N Engl J Med. 2002;347:284-7.

The magazine titles must be abbreviated according to the recommendations of *Journals Indexed for MEDLINE*, available on the National Library of Medicine web-site at: http://www.ncbi.nlm.nih.gov/nlmcatalog/journals

2) Book

Eisen HN. Immunology: an introduction to molecular and cellular principles of the immune response. 5th ed. New York: Harper and Row; 1974.

Norman IJ, Redfern SJ, editors. Mental health care for elderly people. New York: Churchill Livingstone; 1996.

3) Book chapter

Weinstein L, Schwartz MN. Pathogenic properties of invading micro-organism. In: Sodeman WA Jr, Sodeman WA, editors. Pathologic physiology: mechanisms of disease. 2nd ed. Philadelphia: WB Saunders; 1974. p. 454-72.

4) Convention paper

Du Pont B. Bone marrow transplantation. In: White HJ, editor. Proceedings of the 3rd annual meeting of the International Society for Experimental Hematology; 1974 Sep 6-10; Houston, USA. Amsterdam: Elsevier; 1974. p. 1561-5.

5) Thesis

Cairns TG. Infrared spectroscopic studies of solid oxygen [dissertation]. St. Louis (MO): Washington University; 1965.

6) Website information

American Medical Association [Internet]. Chicago: The Association; c1995-2002 [updated 2001 Aug 23; cited 2002 Aug 12]. AMA Office of Group Practice Liaison; [about 2 screens]. Available from: http://www.ama-assn.org/ama/pub/category/1736.html

How to use bibliographical titles in the text

Subsequent studies, using both racemic epinephrine and the levorotatory isomer, administered as an inhalant formulation, have confirmed the higher value of adrenaline as compared to placebo[20] or salbutamol.[21,22]

or

Subsequent studies, using both racemic epinephrine and the levorotatory isomer, administered as an inhalant formulation, have confirmed the higher value of adrenaline as compared to placebo (20) or salbutamol.(21, 22)