# Chapter 6

Concluding remarks

Acute lower abdominal pain in women of child bearing age is a common cause of emergency room visits. It is sometimes difficult to give a provisional diagnosis because of the overlapping symptoms of appendicitis and gynecological conditions. The central question of this thesis: 'What is the most advantageous method to give a provisional diagnosis to a young woman who is suffering from acute lower abdominal pain?' has been explored. Clinical diagnostic indicators and diagnostic scoring may be an alternative approach to the universal use of expensive imaging such as CT and MRI, or invasive diagnostic procedures like early laparoscopy. However, the clinical diagnostic scoring method described in this thesis has some limitations that needed to be considered. As the score was developed from clinical findings, symptoms and signs often depend on phases of a disease and also the experience of the physicians who perform the examination. The expected users of the diagnostic prediction score would be general doctors in emergency room. An external validation study of the diagnostic score in other settings where it was intended to be used, especially in emergency departments and rural hospitals, is still needed before the method can be applied to general clinical use. It is also interest to modify the diagnostic score to be more 'users friendly' by incorporating the score with mobile devices applications. In addition, more clinical indicators that are not significant in the predictive model can be included to the score to improve its accuracy without a burden of calculation if computerization is applied.

From the analysis of the data amassed during the writing of this thesis, surgeons may confidently apply this diagnostic score to initial investigations in clinical practice. It can be used as one of the criteria which inform the decision to admit the patient or whether to refer them for further investigation. For example, a woman presenting with acute lower abdominal pain whose diagnostic scores are less than zero, which indicate non-specific abdominal pain, can be treated as an out-patient without admission. Alternatively, the method can be used by physicians in rural hospitals as criteria to inform the referral of patients with higher scores for further investigation with higher levels of care.

The studies in this thesis can be viewed as diagnostic test studies. However, they are different in some ways. Most diagnostic test research studies give the diagnostic value of the index test as if other clinical information has no contribution in diagnosis.[1] This approach gives high diagnostic indices and overestimates the value of the index tests. The studies in this thesis view diagnosis as a process of gathering and interpretation of clinical information. Therefore, it is better described as diagnostic prediction research.[2] Diagnostic research

resembles the process of clinical practice in diagnosis of a patient by the quantifying of clinical information into a diagnostic score.
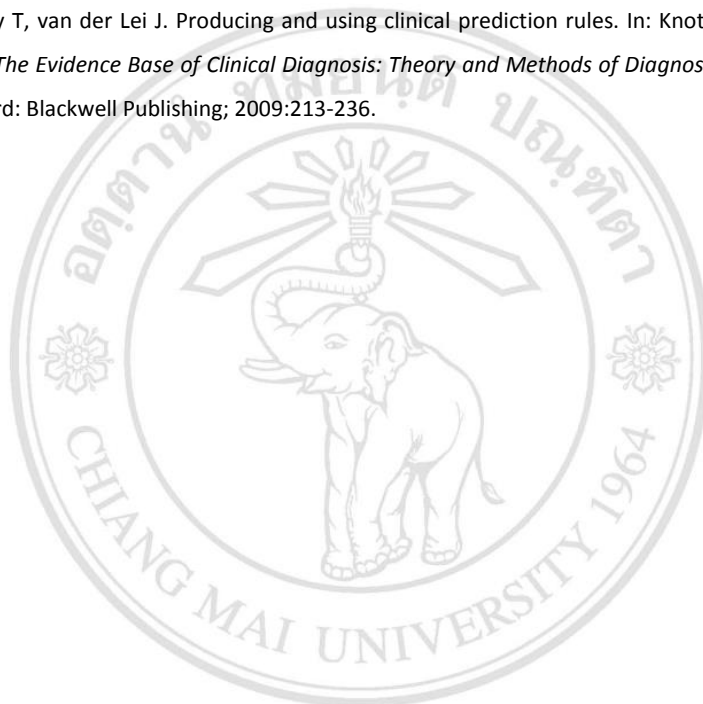
Not all questions have been completely answered by this thesis. The question of generalization of the diagnostic score has been addressed. An external validation study in a prospective way needs to be designed and carried out. The proposed study needs to include a population of patients from settings where it is intended to apply the scoring technique. More research needs to be carried out in rural hospitals as they are sources of 'intent-to-diagnose' patients. Another question is the clinical value of the diagnostic score. This question should be answered if the score has been incorporated into clinical practice. Studies on 'value-added' of the clinical usefulness can be performed to show the impact of the score on clinical practice by comparing the clinical outcomes of patients when using the score with clinical outcomes of patients without using the score. Impact studies on efficiency and overall diagnostic accuracy need to be carried out in the future.[3]
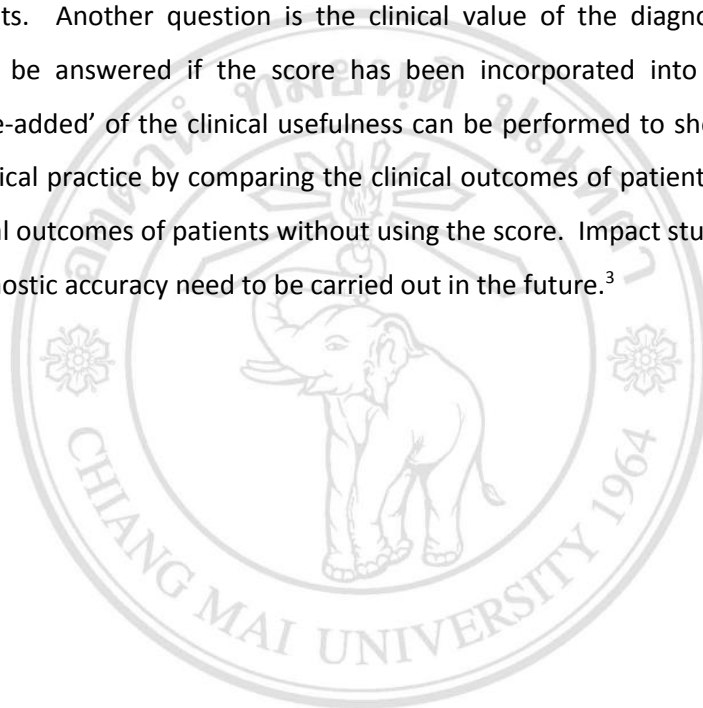
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