

# CHAPTER III

## CONCEPTUAL FRAMEWORK, RESEARCH QUESTIONS AND RESEARCH OBJECTIVES

### 3.1 Research Questions

#### Primary Research Question

Is the average radiation dose from MDCT Siemens Sensation 16 higher than the average radiation dose from Siemens Sensation 4?

#### Secondary Research Question

How much image quality that used various protocol parameters for head and neck (excluding the brain) in each CT scanner?

### 3.2 Research Objectives

#### General Objectives

1. To find the radiation dose in patients during head and neck (excluding the brain) CT examination.
2. To evaluate image quality of head and neck MDCT examination.

#### Specific Objectives

To compare between the average radiation dose of multiple detector-row CT (MDCT) Siemens Sensation 16 with the average radiation dose from Siemens Sensation 4 for head and neck examination.

### 3.3 Hypothesis

The average radiation dose in patients who need multiple detector-row CT (MDCT) scanning for head and neck examination from Siemens Sensation 16 should be significantly more than the dose from Siemens Sensation 4?

### 3.4 Conceptual framework

Parameters : kV

Effective mAs  
 Slice collimation  
 Slice width  
 Feed/Rotation  
 Rotation time  
 Number of slice  
 Length of scanning



Patient → **Need a multiple detector-row CT  
for head and neck scanning**

**Patient**

**CT Images**

- Radiation dose

- Diagnostic quality of  
image

Image noise

Image artifact

Section-sensitivity  
profile