Introduction
Intramedullary nailing is one of the most common and effective treatment options nowadays for fractures of humerus, tibia and femur. However, choosing correct size and length of the implant is crucial to achieve a stable and rigid construct. Moreover, there is an increasing trend for the use of sterile packed implants. If the length of the implant is found to be incorrect once the pack is opened, it cannot be used for another patient and opening of another implant can be costly. This is the reason why accurate and reliable pre-operative planning and measurement is being emphasized nowadays. Using digital radiography, the diameter and length of the intramedullary canal were measured to predict the appropriate implant to be used. However, the degree of magnification and the accuracy of the measurement using this digital ruler were seldom addressed in the literatures.

Objectives
North District Hospital is one of the pioneer HA hospital in Hong Kong to adopt the digital radiography system. We designed this study to investigate the accuracy of measurement by digital radiography for intramedullary nailing of humerus, tibia and femur.

Methodology
It is a retrospective study including all patients with intramedullary nailing of humerus, tibia and femur performed during January 2012 to January 2014 in our hospital. Lengths of the intramedullary nailing were measured using the digital ruler of the digital radiography system. The values were then compared with actual length of the
nail from the operative records. 72 patients were included in total and they were divided into 3 group according to the operation they were performed.

**Result**
We found that 100% of the measurements were inaccurate and were statistically significant. The mean differences in antero-posterior views were 15.5mm (7.1%) for humerus, 24.6mm (7.7%) for tibia and 29.5mm (8.8%) for femur respectively. The magnification factors were from 1.07 to 1.09, which were smaller than conventional X-rays films (1.15). We concluded that using the digital measuring tools in radiography system did not result in accurate measurements of the length of intramedullary nail. The degree of magnification is also different from the standard ratio in conventional X-Ray. Surgeons should pay extra precaution while utilizing such measurement value to avoid using of inappropriate size implant. The use of reduction factors or calibration of digital rulers may be helpful in producing a more accurate assessment. New and accurate methods for pre-operative planning should be developed in order to prevent complication and save money.