



**Service Priorities and Programmes**  
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**Is blood pressure (Systolic and Diastolic) in thigh congruent to upper arm: True or Not?**

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Blood Pressure

Upper arm blood pressure

Thigh blood pressure

Non-invasive automatic machine

Interchangeable

**Introduction**

Accurate measurement of blood pressure (BP) is paramount for treatment decisions. In acute care, there are times, it is either not ideal or not possible to use the upper arm for BP measurement. Therefore, thigh would be an alternative site. However, "what will be the accuracy of the thigh BP when compare to the upper arm measurement?"

**Objectives**

To find out how accurately can the BP (SBP and DBP) measured on thigh predict the BP (SBP and DBP) measured on upper arm by non-invasive BP monitor.

**Methodology**

A prospective experimental study was conducted in the emergency departments of two acute hospitals (Tuen Mun Hospital and Pok Oi Hospital). Subjects were volunteers or hospital staff whose age from 18 to 55 years old and they were ambulatory adult of Hong Kong Chinese. The main outcome measures of the study were to pair the BP measurement on upper arm and thigh in supine position by the non-invasive blood pressure monitor in a laboratory.

**Result**

From December 2012 to April 2013, a total of 99 samples were collected. The value differences of SBP between two sites (thigh - arm) were ranged from -21 to 53 mmHg (mean 6mmHg; SD 11mmHg) whereas the value differences of DBP between two sites (thigh - arm) were from -30 to 20 mmHg (mean -7 mmHg; SD 6.81 mmHg). Results of the paired t test indicated that differences between SBP and DBP measured in the arm and thigh were statistically significant with  $p < 0.0001$ . The correlation between the BP values obtained from the two measuring sites was high, which the Pearson correlation coefficient of SBP (0.881) was slightly higher than that of DBP (0.773). With regard to bland-Altman agreement analyses, the computed upper and lower limits of agreement for SBP were between 28 and -16 mmHg of arm

measurements whereas the limits of agreement for DBP were between 6 and -20mmHg(95% CI). In general speaking, the SBP over thigh has a tendency to be higher than the arm, an overestimated value. The DBP over thigh has a tendency to be lower than the arm, an underestimated value. Differences between measurements of SBP and DBP in the arm differed widely from measurement in the thigh, indicating that the measurements obtained in the two sites are not interchangeable. Therefore, if the BP of thigh was employed, special attention must be paid for treatment decision.