

**Title** Non-Invasive Haemoglobinometer for Haemoglobin Screening in Blood Donors

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#### **Aim**

To evaluate the effectiveness, safety, cost-effectiveness, organisational and social issues of the non-invasive haemoglobinometer for haemoglobin (Hb) screening in blood donors.

#### **Conclusions and results**

A total of 1383 records were identified through the Ovid interface and PubMed, and 18 were identified from other sources (references of retrieved articles). There were nine articles included in this review comprised of diagnostic accuracy studies. The studies were conducted in Korea, India, Italy, Spain, Netherlands, Belgium, German and Brazil.

#### **Effectiveness**

There was fair level of evidence retrieved to suggest that non-invasive haemoglobinometer had lower sensitivity, lower specificity and lower correlation with reference standard compared to invasive method. However, there was one study reported that sensitivity of non-invasive method was higher compared to invasive method [63.2% vs 23.1%]. The non-invasive haemoglobinometer also shown to have lower accordance or agreement with the gold standard compared to invasive method. The PPV was also lower compared to invasive method. However, the NPV for non-invasive haemoglobinometer was inconclusive.

#### **Safety**

There was no evidence retrieved on the adverse events. However, non-invasive haemoglobinometer had lower ability to detect low Hb levels in first time and regular donor compared to capillary invasive method as reported in one study.

#### **Organisational Issue**

There was limited fair level of evidence retrieved to suggest that non-invasive haemoglobinometer required less than 30 to 45 minutes to train new operator, had fast measurement (however, the whole process of pre-donation screening was time consuming due to inability of patients to move). The measurement was also interfered with the patients' condition such as skin colour, cold finger, artificial fingernail, nail polish and etc.

#### **Psychological/social**

There was limited fair level of evidence retrieved to suggest that non-invasive haemoglobinometer was preferred by the blood donors. Among the non-invasive

haemoglobinometer, Haemospect and Pronto 7 rated as the most usable and satisfied by operator.

#### **Recommendations**

Based on the above review, non-invasive haemoglobinometer is not recommended for haemoglobin screening in blood donors.

#### **Methods**

Electronic databases were searched through the Ovid interface: Epub Ahead of Print, In-Process & Other Non-Indexed Citations, Ovid MEDLINE® Daily and Ovid MEDLINE® 1946 to Present, EBM Reviews - Cochrane Central Register of Controlled Trials - October 2017, EBM Reviews - Cochrane Database of Systematic Reviews - 2005 to October 2017, EBM Reviews - Health Technology Assessment - 4th Quarter 2017, EBM Reviews - NHS Economic Evaluation Database 4th Quarter 2017. Searches were also run in PubMed database and U.S. Food and Drug Administration (USFDA) website. Google and Google Scholar was also used to search for additional web-based materials and information. Additional articles were identified from reviewing the references of retrieved articles. Last search was conducted on 13th March 2018.

#### **Further research/reviews required**

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#### **Written by**

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