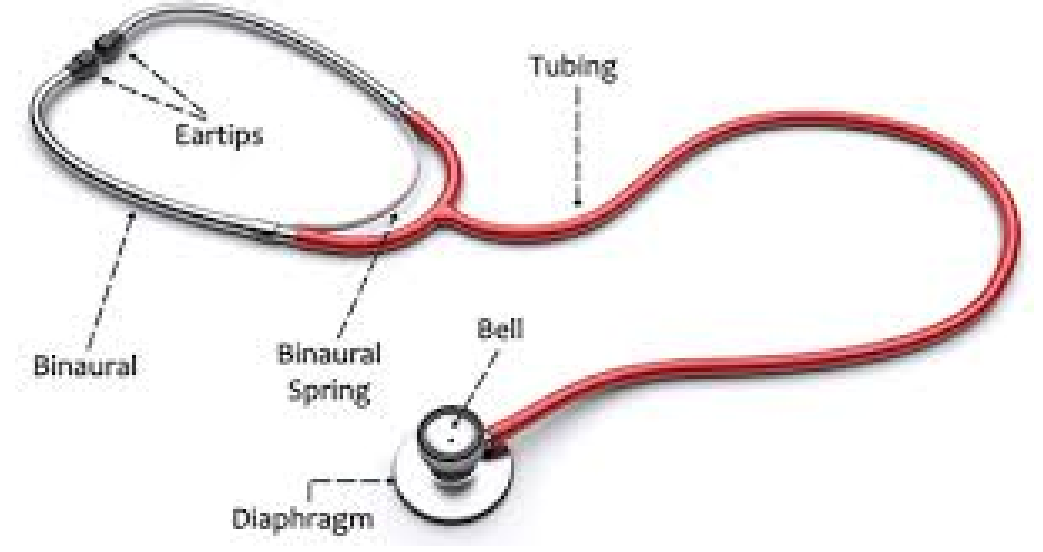




# DOES THE STETHOSCOPE BELL OR DIAPHRAGM IMPACT MANUAL BLOOD PRESSURE MEASUREMENT?

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## Background

### Hypertension

- Impacts ~ 75 million US adults
  - Linked to >400,000 deaths/year
  - Diagnosed by manual BP measurement
- Manual BP Measurement**
- Gold standard in ambulatory care
  - Conflicting standards as to whether the bell or diaphragm of stethoscope should be used

### Research Question

Does utilizing the stethoscope bell versus the stethoscope diaphragm affect manual BP measurement?

## Methods

- Systematic literature review
- Cochrane Collaboration process

## Selection Criteria

- English language
- Clinical research study
- Examine impact of stethoscope side used for manual BP measurement

## Acknowledgements

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Author & Year	Country	Population	Sample Size	Results
Kantola, Vesalainen, Kangassalo, & Kariluoto (2005)	Finland	Internal medicine or surgery inpatients	N=250	No significant difference between bell & diaphragm
Liu, Griffiths, Murray, & Zheng (2016)	UK	Healthy outpatients	N=32	Higher BP values with bell, but only statistically significant for DBP
Mauro (1988)	US	Female nursing students	N=56	Higher mean SBP & lower mean DBP with bell
Prineas & Jacobs (1983)	US	Adults	N=48	Bell paired with brachial artery placement produced higher SBP vs. diaphragm used in antecubital fossa  No difference between diaphragm paired with brachial artery & bell paired with antecubital fossa
Cushman, Cooper, Horne, & Meydrech (1990)	US	Male outpatients	N=48	No significant difference between bell & diaphragm
Norman, Gadaleta, & Griffin (1991)	US	Acute trauma	N=30	Significantly decreased SBP with bell
Byra-Cook, Dracup, Lazik (1990)	US	Critical care	N=50	Compared to arterial line values, the bell used in the antecubital fossa was most accurate

Question: Does utilizing the stethoscope bell versus the stethoscope diaphragm affect manual BP measurement?

PubMed  
(n=21)

CINAHL  
(n=8)

ProQuest  
(n=20)



Merged databases and removed duplicates  
(n=49)

Review of Titles/Abstracts

Excluded: (n=39)

Full Article Review (n=10)

Excluded due to lack of evaluation of stethoscope bell vs. diaphragm (n=3)

Quality Appraisal  
(n=7)

## Results

- 7 case-control studies published between 1983-2016
- 5 studies conducted in the US; 2 internationally
- Participants included healthy populations (n=2), outpatients with hypertension (n=2), & acute care patients (n=3)

### Conflicting Findings

- 2 studies found no difference in manual BP measurement
- 3 studies found a difference in either DBP or SBP only
- 2 studies found a difference in both SBP & DBP

## Conclusions & Implications

- The published literature inadequately answers the question
- Future studies in larger, nationally representative samples with varying BP levels & treatment are indicated
- Acknowledge the lack of evidence on stethoscope side when teaching students about manual BP measurement
- Currently, either side may be used

