

## Where should we place the stethoscope's chestpiece to hear the noise of the primary bronchi ?

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### Introduction

The pulmonary auscultation is used by respiratory therapist (RT) to evaluate the efficiency of a treatment. Listen to the noises coming from the primary bronchi (PB) is important because it is the place where secretions can be accumulated. Therefore, it is crucial to know exactly where to place the stethoscope's chestpiece on the chest. Few studies have analyzed the chest area where the PB were located. Our hypothesis is that PB are localized on a line that joins axillary fossa (Bi-Axillary line: BAL). The aim of our study is to evaluate the probability to find the primary bronchi by analysis of chest radiography.

### Patients and Methods

A retrospective study was performed by analysis of chest X-Ray using the software: TM reception®, which allows precise measures to the tenth of millimeter. All the X-Rays were made on confined to bed patients hospitalized within intensive care unit, internal medicine and abdominal surgery rooms.

The following measures (in mm) were made between:

- a) Lowered perpendicular (LP) of:
  - Bi-Axillary Line (BAL) and the sternal carina (SC)
  - BAL's and the position of right and left PB
  - Middle of the body-sternum (BS) and the perpendicular middle of right and left PB.
- b) Hyoid bone and the SC

The exclusion criteria were: BMI < 18.5Kg/m<sup>2</sup> and BMI > 30Kg/m<sup>2</sup>, scoliosis, minor patient, lack of visibility of one of the axillary fossa, lack of visibility of PB, clavicular asymmetry, kyphosis, lack of symmetry in the shot, atelectasis and pneumothorax.

Statistics: Normality test: KS. Mean values are expressed with their SD and 95% CI.

### Results

		Primary bronchi localization by measurements on Chest X ray			
	Age (years)	LP Right bronchi- BAL (mm)	LP Left bronchi- BAL (mm)	LP BAL- sternal carina (mm)	LP Hyoid bone-sternal carina (mm)
Mean	63	25	27	27	118
Std Dev	16	5	6	6	11
Confidence Interval	+/-4	+/-1	+/-2	+/-2	+/-3

Table 1 (LP: lower perpendicular/ BAL: Bi-Axillary line)

50 X-Rays (Men = 26, women = 24) have been analyzed. Normality test passed.

### Discussion

In this study, we performed analysis of chest x-Rays of bedridden patients and we demonstrated that it is possible to localize easily, on either side of the BS, the right and left PB at +/- 25 mm distance (LP) above a line joining axillary fossa. This study constitutes a new tool for the RT who, by using stethoscope with a chestpiece of 10 cm<sup>2</sup> surface area, will be able to listen to noise coming from PB.

### Conclusion

The data presented herein (Table 1) show that right and left PB are located at a mean distance of 25(+/- 5) mm and 27 (+/- 6) mm above the BAL, on both sides of the BS. The BAL represents thus an easy and precise mode to detect right and left PB by bedridden. Finally, the distance between the hyoid bone and the SC is about 12 cm. As the PB are located after the bifurcation, this information constitutes another useful way for the localization the right and left PB by bedridden patient.

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