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CLINICAL IMAGE

Sizing double-lumen tubes by direct measurement of the mainstem bronchus

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One popular technique of sizing left-sided double-lumen tube (DLT) is to use gender and height (male: 41F/39F for height > 170/ < 170 cm; female: 37F/35F for > 160/ < 160 cm).[1,2] The DLT bronchial stump should be 2–3 mm smaller than the bronchial internal diameter. However, based on 3 dimensional spiral computer tomography (CT), the gender-height approach underestimated the ideal size of left-DLT in 2/48 cases and overestimated in 9/48 cases.[3]

Tracheobronchial measurements can be estimated on a plain chest radiograph, but these measurements have a magnification factor of 1.05–1.40. Additionally, bronchial borders are often obscure. Three-dimensional spiral CT reconstruction is seldom available. Conversely, CT scans are ubiquitous in thoracic surgery and can be utilized to estimate bronchial diameters for sizing DLT[4]; yet, the technique is not described in anesthesiology textbooks.

Tracheobronchial anatomy in thoracic patients is variable. In this CT of a 184 cm tall male (Fig. 1), the diameter of the left mainstem bronchus immediately distal to the carina is 11 mm. Based on height, this male would have been intubated with a 41F left-DLT, when, in fact, even a 35F left-DLT — which some authors have proposed as the universal

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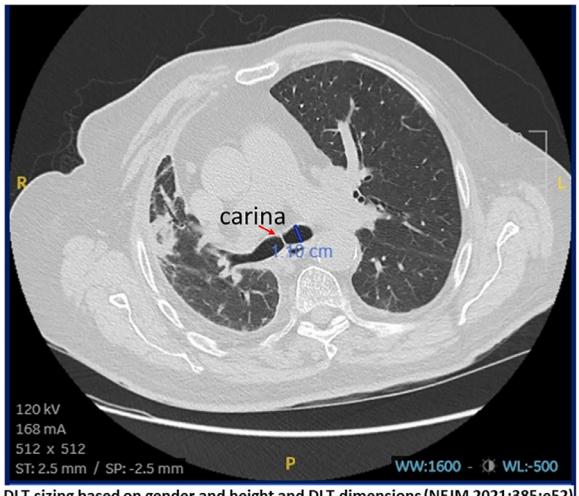
The outer diameter (OD) of a 32-Fr double-lumen tube (DLT) would fit the left mainstem bronchus. The incisor-left main distance in this 184-cm tall man is ~32 cm, too long for a 32-Fr DLT.



DLT sizing based on gender and height and DLT dimensions (NEJM 2021;385:e52)

Gender & Height	DLT Size (Fr)	DLT Dimensions (mm)		
Male		OD	Bronchus ID	Trachea ID
>170 cm	41	13.7–14.9	5.4	5.4
160–170 cm	39	13.8–14.3	4.9	4.9
<160 cm	37	13.3–14.0	4.5	4.7
Female				
>160 cm	37	13.3–14.0	4.5	4.7
150–160 cm	35	12.0–13.5	4.3	4.5
<150 cm	32	10.5–11.2	3.4	3.5

Figure 1 Axial computed tomography image of a 184 cm male immediately distal to the carina (red arrow) where the left main bronchial diameter is measured at 11 mm. Based on the gender-height approach (Table), this patient would likely have been intubated with a 41F double-lumen tube (DLT), when, in fact, even a 35F DLT might have been excessively large. Note that the table has been adapted from work by Hao et al.[1] (https://doi.org/10.1056/nejmvcm2026684) and Licker et al. (https://doi.org/10.1016/j.tacc.2014.04.003). OD, Outer Diameter; ID, Inner Diameter.

size for all adults — might have been excessively large. An endobronchial block might have been more appropriate.

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Ethics and Consent

Not applicable as neither the manuscript nor the image present patient identifiable data.

Conflicts of interest

The authors declare no have conflicts of interest.

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