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7 LETTER TO THE EDITOR

Capillary blood gases in acute exacerbations of COPD by Ross Murphy et al. 11

It is with great interest that I read the paper by Ross 13 Murphy et al.¹ With reference to the poor correlation between arterial PO_2 and earlobe capillary 15 PO_2 , I would like to suggest a few reasons for these discrepancies. There have been several previous 17 publications^{2,3} and an important editorial,⁴ where good correlation was found with arterial and 19 capillary PO₂'s. However, these studies all used blood gases where the PaO_2 's were less than about 21 13.0 kPa.

In Professor Hughes editorial,⁴ he clearly stated 23 that capillary samples with PO_2 's greater than 11.0 kPa should be treated with caution. I note 25 from Dr. Murphy's study that there were a significant number of data points plotted that had 27 PO₂'s in excess of 11.0 kPa. A few blood samples had PaO₂'s of approximately 30.0 kPa. I believe that 29 this was the likely reason for lack of comparability with a significant number of samples. It is evident 31 from the graphs plotted that the poor correlation could be easily seen when those samples with high 33 PaO₂'s were included. However, there was good correlation when blood gases with low PaO₂'s were 35 used (PaO_2 's < 12.0 kPa). Generally speaking, if capillary blood sampling is used in conjunction 37 with high PO_2 blood samples, there is a tendency for the 'real' result to be underestimated, probably 39 due to an inevitable fall in the capillary blood gas PO_2 . This is associated with the initial PO_2 in the 41 blood gas, having a higher oxygen partial pressure than that in the atmosphere.

43 Another potential problem was probably related to blood flow, it was stated by Dr. Murphy that the earlobe was pricked with a sterile needle. Our experience over 30 years is that you almost

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certainly need to collect the earlobe blood sample in less than about 10 s; otherwise the PO_2 may well 57 be affected. I believe this would be a very difficult task to carry out using a needle and that is why we 59 use a number 15-scalpel blade which ensures a good blood flow with a collection sample time of 61 less than 10 s.

I also noted that in Dr. Murphy's paper, he found 63 it necessary to squeeze the earlobe in order to obtain a sufficient blood flow. This is not good 65 practice as mentioned in Professor Hughes ERJ editorial⁴; it would seem that the fluid collected 67 from the cut earlobe is a mixture of blood from the capillaries and venules. When the ear lobe is 69 squeezed, the capillary PO_2 will almost certainly be underestimated, as the blood being sampled is 71 probably no longer 'arterialized' capillary blood.

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