Use of Lowercase “p” or Uppercase “P” to Express Blood Gas Data: Does It Make a Difference?

To the Editor:

Most clinical chemistry laboratories in Italy and elsewhere express the partial pressure of blood gases with a lowercase “p”, as in pO2 and pCO2, but an uppercase “P”, as in PO2 and PCO2, is also used frequently. We found that lowercase “p” appeared in the term “pco2” on 10 of the first 20 web sites of US universities found by the Google search engine and in 40 of the first 100 titles and abstracts indexed in Medline. We also found this term in laboratory manuals, such as the Laboratory Test Handbook (D.S. Jacobs et al. eds.) and Clinical Laboratory Diagnostics (L. Thomas, ed.), and in the reports of some blood gas analyzers (e.g., Bayer and Radiometer).

Conversely, some textbooks express the partial pressure of blood gases with an uppercase “P”, and others list the uppercase italicized P as the preferred usage and lowercase italicized p as an alternative (Tietz Textbook of Clinical Chemistry and Molecular Diagnostics, 4th Edition, page 999). Variation also exists in the format used for the gas, which is sometimes normal case and sometimes subscripted (e.g., PO2 and P02).

The International Union of Pure and Applied Chemistry (IUPAC) recommends the use of lowercase italicized p followed by the gas in subscript (e.g., pO2 and pCO2; www.iupac.org/publications/books/gbook/green_book_2ed.pdf, page 42), but such an expression generally is not used either in the literature or in laboratory reports, perhaps because of poor graphic readability or computer display limitations. Moreover, although in most cases the meaning of the lowercase p will be clear from the context, confusion is possible because the lowercase p is the operator symbol for the negative logarithm in common expressions such as pH, the negative logarithm of the [H+] measured in moles per liter, and pK, the negative logarithm of the constant of the Henderson equation. Note that the laboratory results for pH and the partial pressures of O2 and CO2 are in close proximity on most laboratory reports.

For a discipline such as laboratory medicine, which produces information expressed mainly with numerical values, a more rigorous approach to the expression of results is advisable. We recommend avoiding the use of the lowercase p to express partial pressure and recommend using only the less ambiguous uppercase P to express partial pressure.

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Editor’s Note: This journal follows the style of Scientific Style and Format. The CBE Manual for Authors, Editors, and Publishers, and thus uses an italicized uppercase “P” with small caps and subscript for the gas, as in PCO2.

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Importance of Low Concentrations of Cardiac Troponins

To the Editor:

Recent studies, including outcome data (1), suggest that troponin values below the 99th percentile contain important diagnostic information. We reported that patients with stable chronic heart failure have cardiac troponin I (cTnI) values below the 99th percentile but above the detection limit (2), whereas in control individuals, cTnI is usually undetectable. Recently, we asked whether values below the 99th percentile were helpful in distinguishing patients with more severe heart disease from those with less severe disease. We studied 146 consecutive stable cardiovascular outpatients scheduled for cardiac catheterization [88 males; mean (SD) age, 64 (8) years] with bicycle stress tests, echocardiography, and left heart catheterization. After catheterization, without knowledge of the cTnI values, the patients were divided into those with (a) coronary artery disease [CAD; n = 80 (55%), i.e., patients with at least one coronary artery stenosis ≥70%; (b) myocardial dysfunction [MyD; n = 24 (17%)], i.e., patients with abnormal systolic or diastolic function, volume, or pressure load attributable to valvular heart disease; or (c) patients lacking the characteristics of the CAD or MyD groups (n = 42; 29%).

Plasma samples (lithium heparin) were obtained before catheterization. cTnI was measured by the second-generation Stratus CS® with reagents provided by Dade Behring. The limit of detection for this assay is 0.02 μg/L (3), the 99th percentile is 0.07 μg/L (4, 5), and the lowest concentration with a CV <10% has been reported as both 0.06 μg/L (5) and 0.10 μg/L (4), respectively. Measurements were performed in duplicate and averaged if within 3 SD of the variance of the assay, estimated to be 20%. If values were more discrepant, a third value was done, and they were averaged.

cTnI results for the 3 groups and for a combined CAD and/or MyD...