ing 16 ml of agar, a 25-µg ampicillin disc consistently gives an inhibition zone of about 40 mm diameter using the Oxford strain of Staphylococcus aureus.

The figure shows a positive result of this test. Sputum from a patient with cystic fibrosis has been shown to have strong penicillinase activity by a unilateral reduction of the zone of inhibition.

Reference


Letters to the Editor

The Use of SI Units

Dr Baron and associates (J. clin. Path., 1974, 27, 590) recommends the use of SI units because they form a coherent system and are being introduced throughout pure science in publications and teaching. In Denmark they were recommended some years ago by the Danish Society of Clinical Chemistry and the Danish Society of Internal medicine, but they have so far mostly been introduced in central laboratories and are far from universally accepted. Several clinicians feel that the advocates of SI units ought to have investigated whether the introduction of the SI system would mean a real benefit they to patients or not; also feel that those urging the use of SI units have been hypnotized by the scientific coherence of the system and have forgotten that their job is not pure science but primarily for the benefit of patients. Further it seems to have been overlooked that the inconvenience to doctors and other health workers—especially the more mature ones in responsible posts—will require many meetings, many irritating telephone calls, and much paper—which all means money at a time when the resources available for the health sector are decreasing. Further it seems biologically doubtful to express concentrations in serum and urine in Moles because most substances to not react there but only on the cellular level. The shift to the SI system may even in some cases be dangerous as, for blood urea (conversion factor 1 mM = 6 mg/100 ml) and blood sugar (conversion factor 1 mM/l = 18 mg/100 ml), and it is certainly easier for nurses to remember that the normal fasting blood sugar is <100 mg/100 ml than 5'55 mMol/l. And what is the benefit of this to the patient? For drug analyses it may even seem a little ridiculous to express concentrations in moles as the patients receive drugs in grains, grams or milligrams!

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SI Units

Professor Baron and his colleagues are to be congratulated on their article, 'The use of SI units in reporting results obtained in hospital laboratories'. It must have involved tedious labours and in general their recommendations will surely gain wide support. It is all the more unfortunate therefore that their work should be marred by the recommendation to report thyroxine iodine rather than thyroxine. Many laboratories currently measure thyroxine by specific methods, standardized against thyroxine, not iodine, and already report thyroxine. It is difficult to justify the use of thyroxine iodine on scientific grounds. Other reservations about their recommendations, such as inconsistent attention to significant figures as in serum calcium, and occasionally unnecessary use of decimals, as in serum urate, in contravention of their own rules, are more trivial. The lack of definite guidance on blood pH or hydrogen ion concentration, and no mention of SI conventions for plasma drug concentrations, are also unfortunate. Excellent though it is in most respects, it is to be hoped that their paper will be a basis for discussion and amenable to amendments, but not the final word.

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Problems in the Introduction of SI Units

IN REPLY TO DR T. K. WITH
We note that on successive lines of his letter he refers to concentration expressed in mM, mM/l and mMol/l, thereby illustrating the need for standardization of symbols on an agreed international basis! Units and symbols in medicine have developed empirically and have become illogical and conflicting. This has lead to confusion both in communications between hospitals concerning records of patients, and in comparing published information in journals. It is partly to avoid this that the Système Internationale is being introduced. As the scientific world outside medicine is using these units it is also necessary for us to change in order that we speak the same language. The change to SI units is therefore concerned, amongst other things, with communications, and with the removal of barriers to a flow of knowledge from one branch of science to another.

Dr With's arguments could be applied to any change in medicine or daily life. The change from mass concentration to equivalents (for electrolytes) was accomplished successfully despite similar objections and prophecies of doom and was generally accepted although ambiguities were left. The use of the mole scale will eliminate these. It was not so long ago that haemoglobin was reported as 'per cent' (of what!). There was initial resistance and foreboding, but acceptance of the change to g/100 ml rapidly became universal.

There would seem to be some advantage in expressing not only blood concentrations of drugs, but eventually also drug dosages, in molar terms; though use of molar concentrations does not invalidate the use of metric doses. Traditionally dosages have been given in grains, teaspoonfuls, etc, but nobody then expressed assay results in these...
Letters to the Editor

terms. The use of mole quantities and concentrations would resolve confusion likely to arise when substances existing in different forms were in use; the number of moles of active substance would remain the same even though salts of different mass, or of compounds with different amounts of water of hydration, for example, were being used.

IN REPLY TO DR A. M. BOLD AND HIS COLLEAGUES

Our paper has already been the subject of discussions within the professional organizations concerned for several years: no set of recommendations is ever final. It is likely that some of our recommendations will need to be modified in the light of experience, and others will certainly need to be added later, but a start had to be made.

We agree that guidance is needed for the units for plasma drug concentrations: it seems rational that the results of analyses of drugs, metals, and other exogenous substances in body fluids should also be expressed in SI units. Recommendations on this must await consultations with clinical pharmacologists, pharmacists, and others. This consultation must now be sought, and may lead to discussions on units for doses. Intravenous electrolytes are beginning to be prescribed on a mole basis. In our view, the choice between expressing results as pH or as hydrogen ion concentration is a matter of scientific controversy, and not primarily concerned with SI units: the same applies to enzyme units.

Currently some laboratories report T₂ and T₄ measurements in terms of iodine (so that it can be related to PBI) and others in terms of the amino acid. As a working party on SI units we have no views on which is better, but the two are often confused. In listing thyroxine-iodine we do not recommend that this should be used in preference to thyroxine, but only that it should be clearly designated. We accept that this could be made clearer by adding (serum) thyroxine (total) to the table of components (molar wt 776.9; normal range 5-10 μg/100 ml; 60-130 nmol/l: (hospital values 1-20 μg/100 ml; 10-260 nmol/l): multiplication factor 12-87).

Cell counts (also applicable to microbiology)

We wish to recommend that cell counts in urine and in cerebrospinal fluid are expressed per litre in the same manner as are haematological cell counts.

SI units in radiation measurement

At a recent meeting the International Committee on Weights and Measures decided to adopt special names for the SI units of absorbed dose and activity (of a radioactive source). These decisions are subject to ratification by the General Conference on Weights and Measures.

The new names are as follows:

Activity: the becquerel, symbol Bq

1 Bq = 1 s⁻¹ = 2.70 × 10⁻¹⁰ Ci (3.7 × 10¹⁰ Bq = 1 Ci)

Absorbed dose: the gray, symbol Gy

1 Gy = 1 J kg⁻¹ = 100 rad (10⁻¹ J kg⁻¹ = 1 rad)

It was also decided not to adopt a new name for the SI unit of exposure, C kg⁻¹ (1 roentgen = 2.58 × 10⁻¹ C kg⁻¹).

No decision was made on the continued use of the rem as the unit of dose equivalent.

D. N. BARON
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M. COHEN
T. S. LANSLEY
S. M. LEWIS
AND N. K. SHINTON

Book reviews


This review is in two parts. The first deals with an assessment of cytostatic drug therapy (immunosuppressive agents) in a number of 'autoimmune' diseases. The review puts into perspective the current standing of these powerful and potentially dangerous drugs. The facts which emerge are not reassuring, since doubts of their efficacy in a variety of conditions reviewed remain. The authors point out that this uncertain and unsatisfactory position has arisen from a lack of widespread use of accepted methods of clinical trial, with the exception of a few studies. They justifiably conclude that it is their opinion that this type of treatment has a potential, but this may not be realized if past trends for uncontrolled investigations continue. Valuable tables summarizing some of the better trials are presented, and will prove useful for the reader who wishes to acquaint himself with some of the results and references of the relevant work.

The review on systemic lupus erythematosus, in comparison to the book by Dr Dubois (also reviewed in this issue), is somewhat amateurish, but covers the important areas. The author is imaginative and provocative in his approach about the areas of contemporary research. Being quite short the review can be read quickly by anyone who wants to keep abreast of some of the conceptual developments in this field.

R. N. MAINI

Lupus Erythematosus 2nd ed. Edited by Edmund L. Dubois. (Pp. xv + 798; illustrated. $36.00 + $1.50 shipping in the USA; 6% sales tax for California residents.) Los Angeles, California: University of Southern California Press. 1974.

Modestly subtitled, 'A review of the current status of discoid and systemic lupus erythematosus', the contents of this book cover 800 pages, and are in fact, encyclopaedic. In this timely second
Problems in the introduction of SI units.

D N Baron, P M Broughton, M Cohen, T S Lansley, S M Lewis and N K Shinton

*J Clin Pathol* 1975 28: 164-165
doi: 10.1136/jcp.28.2.164-c

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