

Effective pharmacological demonstrations to 100 students

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Pharmacology is a practical science and its teaching is greatly assisted by experiments which demonstrate and reinforce well known basic principles and actions of drugs. Efficient teaching of practical pharmacology to 100 students is difficult to organize, requires large laboratories, large amounts of apparatus, and inevitably requires a large number of staff.

As part of a comprehensive course in practical pharmacology for medical students we demonstrate the effects of drugs on the peripheral nervous system (anaesthetized cat, isolated heart and intestine preparations, neuromuscular junction in skeletal muscle) using a multi-channel recorder with overhead projection facilities ('Physiograph'; Narco Biosystems, Inc., U.S.A.).

The demonstrations are conducted in a conventional tiered lecture theatre with a large projection screen. The advantages of this arrangement are obvious:

- low staff/student ratio (two academic and two technical staff for 100 students)
- minimization of apparatus failure and elimination of poor experimental design
- elimination of lack of students' expertise
- supervised discussion on every aspect of the demonstration with full encouragement given to voice every opinion so that misunderstandings and errors of judgement and fact can be rectified.

The students are encouraged to make full notes during the demonstration and discussions, and are required to present a concise account of events. To help them a statement on the main aims and objectives of the demonstration is available, as are specimen traces of results.

We have tried to assess the effectiveness of this method of teaching by comparing the performance of students in determinate multiple choice questions on aspects of peripheral nervous system pharmacology which had been demonstrated and other aspects which had not been demonstrated. We were encouraged by the following results obtained in two successive years (1974, 1975). The mean facility \pm s.e. mean (defined as the percentage of students making the correct response) for demonstrated aspects (85 ± 2.9 in 1974; 85 ± 2.6 in 1975) was significantly greater ($P < 0.01$) than the mean facility for non-demonstrated aspects (70 ± 3.3 in 1974; 68 ± 5.2 in 1975).

To give the students an idea of their own performance and to help us to identify problem areas in knowledge and understanding, we have introduced short (about 30 items) determinate tests at the end of a series of demonstrations. The students mark each others' answer sheets and calculate the score. Each individual item is then assessed for facility, and any problem questions (we take a facility of < 60 as the cut off point) is discussed again in the hope of correcting misconceptions or supplying facts where there were areas of ignorance.

We consider that this method has many advantages over conventional large practical classes especially in these times of increasing student numbers and restriction on appointment of new staff. There has been no decrease in standards and from our experience it is popular with both staff and students.

Developments in the use of television for pharmacology teaching

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Since the earlier demonstration given to the Edinburgh meeting of the Society in 1974, two developments of practical interest to pharmacologists could be noted:

(i) Colour productions.

In these cases, original monochrome productions have been updated and the use of all colour or partial colour television material has been introduced into the

teaching curriculum. In the tapes to be demonstrated, different aspects of the usefulness of such material will be emphasized.

- (a) An all colour presentation of the recording of nerve action potentials in the anaesthetized animal will be shown. The tape has been prepared in the studios of the University of Aberdeen and is presented by Professor Malcolm.
- (b) A series of partial colour productions prepared by Dr Foy, Dr McCurrie and Professor Leach of the University of Bradford will also be shown. These will include relevant aspects of lecture demonstration material from areas such as mammalian blood pressure and respiration recording, mechanism of muscle relaxant action and the actions of sympathomimetics on the Langendorff perfused heart preparation.