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BRITISH MEDICAL JOURNAL

SATURDAY 2 APRIL 1983

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NO 6371 BRITISH MEDICAL JOURNAL 1983 VOLUME 286 1079-1162
BRITISH MEDICAL ASSOCIATION TAVISTOCK SQUARE LONDON WC1H 9JR.

WEEKLY. ISSN 0007-1447
ASTM CODEN: BMJOAE 286 (6371) 1079-1162 (1983)

CORRESPONDENCE

We may return unduly long letters to the author for shortening so that we can offer readers as wide a selection as possible. We receive so many letters each week that we have to omit some of them. Letters should be typed with double spacing between lines and must be signed personally by all their authors, who should include their degrees. Letters critical of a paper may be sent to the authors of the paper so that their reply may appear in the same issue.

Use of blood in elective general surgery

SIR,—Mr J A Smallwood (12 March, p 868) rightly draws attention to the need for tighter controls in surgical blood ordering practice and the wastage of resources that occurs when such practices are lax. The crossmatch to transfusion ratio can provide a valuable guide to efficiency in this respect. Such figures must, however, be interpreted with caution when used as a basis for comparison. This is exemplified by the high figure of 36·25 from Mr Smallwood's survey, which I presume would not be true for surgical practice as a whole at the hospital concerned. The survey did not consist of a representative sample of the operations performed that may require crossmatched blood. When this is done much lower figures should result, which reflect more accurately the efficiency of the blood ordering procedure.

During a survey of practice in hospitals in South Wales crossmatch to transfusion ratios of the order of 2 to 4 were typical for the total surgical workload, the highest figures generally reflecting a larger proportion of obstetric and gynaecological surgery. These ratios are close to the optimum target proposed by Raault and Gruenhagen for hospitals providing a general range of services.[1] From local experience the operations in group I (vagotomy, simple mastectomy, cholecystectomy, and thyroidectomy) comprise less than 10% of all surgical work; thus even if unnecessary crossmatching is performed the high crossmatch to transfusion ratio of this group alone will have less effect on the overall figure for routine surgical practice.

I am not able to agree with the author's calculated overall crossmatch to transfusion ratio. A total of 2889 units were crossmatched, and of these 485 were used. This gives a crossmatch to transfusion ratio of 6 for the group of procedures studied. I am also not sure how the author's figure of 36·25 was calculated, but it seems close to the average of the crossmatch to transfusion ratios for each of the surgical procedures. This is as statistically misleading as an average of averages when an index of inappropriate crossmatching is required.

High crossmatch to transfusion ratios indicate that blood units have an increased chance of outdating and that blood bank staff are unnecessarily overworked, but there are also more immediate and clinically important disadvantages. The risk of substandard serological performance or even ABO mishaps are much increased when staff are under excessive pressure. Overordering of blood leads to excessive numbers of crossmatched blood units unavailable for general use. Thus the mean age of blood units actually transfused to patients must increase and the viability and oxygen carrying capacity after transfusion must be reduced.

It is thus in the interests of patients to seek efficiencies in blood ordering practice and the excessive caution that leads to overordering should be discouraged.

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[1] Raault C, Gruenhagen J. Reorganisation of blood ordering practices. *Transfusion* 1978;**18**:448-53.

Artificial blood

SIR,—I read with interest the article by Dr P M Jones (22 January, p 246), which summarised some important clinical findings using perfluorocarbon emulsions as blood substitutes. While there is no doubt that the ability to replace the blood with a synthetic substitute would have very profound clinical implications and solve a number of problems associated with conventional transfusion, I believe that it is important to draw attention to two important points related to the use of perfluorocarbon emulsions in blood replacement.

Firstly, while much has been written about the many possible therapeutic applications for these oxygen carrying perfluorochemicals the problem of potentially deleterious responses to such preparations has received little attention. Vercellotti *et al* reported an adverse pulmonary reaction in an American patient receiving the proprietary emulsion, Fluosol-DA 20% (Green Cross Corporation, Osaka, Japan), to overcome anaemia after surgery.[1] Haematological abnormalities, including neutropenia and thrombocytopenia, were also seen in rabbits receiving either Fluosol itself or one of its components, Pluronic F-68, a nonionic detergent used to maintain emulsion stability. Although these responses could be diminished by treatment beforehand with methylprednisolone, such findings do draw attention to the need for further evaluation of the immunological consequences of using Fluosol and other similar emulsions.

Fluosol-DA contains yolk phospholipids.[2]