Staff awareness of cost of anaesthetic drugs, fluids, and disposables

Recently reports have highlighted the cost of anaesthetic agents and how the cost of giving an anaesthetic has increased in real terms.^{1,2} Awareness by staff of the price of drugs, intravenous fluids, and equipment may influence their

familiarity of theatre nurses with some items led them to give grossly inaccurate estimates of cost. More alarming is the consistent underpricing of the agents that Lethbridge *et al* showed were the main cause of rising costs³;

Mean (SD) price of items as estimated by anaesthetic staff

		Estimated price (£)				
	Actual price (£)	Consultants	Juniors	Operating department assistants	Theatre nurses	Intensive care unit nurses
Disposables:						
23g Butterfly	0.20	0.53 (0.20)	0.32 (0.21)	0.30 (0.19)	0.61 (0.62)	0.58 (0.26)
16g Cannula	0.48	0.85 (0.44)	0.66 (0.42)	0.69 (0.44)	0.56 (0.34)	0.82 (0.45)
1 ml Syringes	0.08	0.26 (0.24)	0.17 (0.06)	0.17 (0.20)	0.26 (0.20)	0.10 (0.02)
2 ml Syringes	0.04	0.29 (0.18)	0.15 (0.08)	0.19 (0.20)	0.31 (0.23)	0.06 (0.05)
10 ml Syringes	0.09	0.29 (0.24)	0.18 (0.11)	0.23 (0.21)	0.48 (0.34)	0.14 (0.06)
Intravenous infusion set	0.93	2.32 (1.23)	1.76 (0.74)	2.15 (1.01)	2.86 (1.37)	2.07 (1.22)
Electrocardiography electrodes (3)	0.57	1.13 (0.50)	0.77 (0.39)	0.80 (0.67)	1.74 (1.39)	0.38 (0.22)
Reel of Micropore 1 inch	0.19	1.91 (1.59)	0.88 (0.60)	1.05 (0.49)	1.65 (1.28)	1.09 (0.64)
Reel of zinc oxide tape 1 inch	0.72	1.03 (0.71)	0.87 (0.68)	0.83 (0.51)	1.10 (0.76)	1.10 (0.58)
Portex endotracheal tube size 8	1.63	1.63 (0.68)	2.98 (2.20)	2.50 (2.01)	4.00 (1.46)	2.11 (0.89)
Leadcath central line	8.24	4.83 (1.86)	9.14 (7.29)	5.09 (3.63)	5.48 (3.19)	4.87 (2.52)
Drugs:						
Thiopentone 500 mg	1.49	1.03 (1.44)	1.28 (1.45)	2.65 (2.86)	5.09 (5.55)	2.13 (1.62)
Etomidate 1×10 ml ampoule	1.05	2.37 (1.88)	1.27 (0.48)	2.10 (2.47)	3.19 (1.58)	1.90 (1.33)
Pancuronium 1×4 mg ampoule	0.67	0.75 (0.51)	0.70 (0.53)	0.88 (0.84)	2.41 (2.01)	1.35 (1.16)
Atracurium 1×50 mg ampoule	1.43	1.97 (1.31)	1.79 (1.06)	1.46 (1.07)	2.62 (1.92)	1.70 (1.43)
Suxamethonium 1×100 mg ampoule	0.31	0.34 (0.25)	0.47 (0.26)	0.72 (0.62)	2.46 (1.17)	1.40 (0.99)
Fentanyl 1×100 µg ampoule	0.45	1.63 (1.44)	1.17 (0.84)	1.57 (1.38)	3.40 (2.14)	2.04 (1.08)
Fentanyl 1×500 µg ampoule	2.05	4.66 (2.96)	3.51 (2.27)	3.12 (2.15)	6.16 (3.90)	4.33 (2.47)
Morphine 1×10 mg ampoule	0.17	0.20 (0.22)	0.69 (0.90)	1.49 (1.58)	4.29 (4.19)	3.31 (1.97)
Halothane 1×250 ml bottle	10.49	11.12 (7.12)	11.00 (7.05)	7.25 (5.67)	13.64 (12.10)	5.67 (2.74)
Enflurane 1×250 ml bottle	38.35	25.40 (11.03)	25.04 (8.13)	11.55 (10.91)	16.40 (17.84)	6.40 (3.01)
Isoflurane 1×100 ml bottle	33.50	30.47 (20.13)	41.12 (17.20)	16.80 (13.48)	13.14 (12.10)	13.60 (16.18)
Naloxone 1×0.4 mg ampoule	4.92	1.98 (1.45)	3.08 (2.71)	1.27 (1.09)	4.46 (6.44)	2.18 (0.75)
Intravenous fluids:						
5% Dextrose 500 ml	0.97	1.53 (0.68)	2.18 (1.59)	1.39 (1.50)	3.74 (2.53)	1.28 (0.58)
Haemacel 500 ml	3.81	4.38 (2.37)	11.90 (14.71)	4.71 (3.16)	9.05 (6.75)	4.38 (1.87)
1 Unit whole blood	21.00	38.04 (26.16)	38.85 (18.36)	42.80 (18.81)	18.55 (11.57)	10.41 (8.50)
1 Unit fresh frozen plasma	12.25	35.96 (19.98)	35.00 (18.10)	50.50 (42.06)	17.15 (9.25)	11.11 (10.98)
1×400 ml Bottle human plasma protein fraction	24.15	38.90 (25.30)	28.55 (9.63)	41.00 (27.06)	17.44 (9.13)	9.78 (7.37)

practice and, ultimately, departmental expenditure. This study was undertaken to show the extent of this knowledge among various groups of staff who use anaesthetic drugs and supplies.

Methods and results

We prepared a list of commonly used drugs, disposables, and intravenous fluids. Subjects were asked to give the cost to the Leeds Eastern Area Health Authority of each item. We studied five groups of staff who use anaesthetics: consultant anaesthetists, junior anaesthetists, operating department assistants, theatre nurses, and intensive care unit nurses. Each group consisted of 10 subjects.

The mean and standard deviation of the estimated cost of each type of item used in anaesthesia (drug, fluid, or disposable) were calculated for each group of staff. These costs were compared with the wholesale price of the item or, for blood or a blood product, the price charged by Leeds Eastern Area Health Authority to private practice. Contract prices were not used as they are confidential information. The table shows the results. Most items were overestimated, with a few consistent exceptions: all groups underestimated the cost of naloxone and enflurane, and all but the junior anaesthetists underestimated the cost of isoflurane and a Leadcath central line.

Comment

As departmental budgeting is introduced, awareness of costs within departments should be encouraged. A previous report found that junior anaesthetists had a fair knowledge of costs³; we found that, though knowledge did not differ greatly among the groups studied, the lack of

naloxone and enflurane were underpriced by all groups in our study, and isoflurane by all but the junior anaesthetists.

As Wickings *et al* implied in 1983, clinical costing studies^{2,4} will have little impact if not accompanied by powerful educational programmes.⁵ Drugs accounted for 8.3% of the total anaesthetic bill in 1978.² If this figure rises and economic use of disposables and blood products is not encouraged there may be pressure to cut staffing levels, which are the major item in an anaesthetic department's budget. This study shows that awareness of the cost of anaesthetic drugs, intravenous fluids, and disposables is lacking among staff who use these materials.

1 Mosley H, Kumar AY, Bhavani Shankar K, Rao PS, Homi J. Should air-oxygen replace nitrous oxide-oxygen in general anaesthesia? *Anaesthesia* 1987;42:609-12.

2 Lethbridge JR, Secker Walker J. Cost of anaesthetic drugs and clinical budgeting. *Br Med J* 1986;293:1587-8.

3 Simpson PM. The cost of anaesthetic drugs and equipment. *Anaesthesia* 1978;33:53-9.

4 Bailey PW. Pricing of anaesthetic techniques. *Anaesthesia* 1978;33:235-41.

5 Wickings I, Coles JM, Flux R, Howard L. Review of clinical budgeting and costing experiments. *Br Med J* 1983;286:575-8.

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