minor renal anomalies are removed from Luck's figures the sensitivity falls to just under 70%; this is the sort of figure obtained in many other departments and, I believe, the one that should be quoted when talking about the overall sensitivity of routine ultrasound.

One other factor that Luck did not make clear was the time each of the scans took to perform; this needs to be clearly stated when cost benefits are being calculated.

M J WHITTLE

Department of Fetal Medicine,
Birmingham Maternity Hospital,
Birmingham B15 2TG

1 Luck CA. Value of routine ultrasound scanning at 19 weeks: a four year study of 8849 deliveries. *BMJ* 1992;304:1474-8. (6 June.)

EDITOR,—Carole A Luck cannot claim 100% sensitivity for detecting abnormalities of the renal tract¹: major congenital abnormalities of the renal tract may be impossible to detect clinically at birth and may not come to light for several months or years. Livera *et al* scanned 6292 pregnant women at 28 weeks' gestation, looking specifically for abnormalities of the renal tract.² During 18 months' follow up they identified seven babies with abnormalities that had not been detected antenatally. Chitty *et al* have reported similar findings.³ In our unpublished survey of over 10000 deliveries at Torbay Hospital between 1985 and 1989 we discovered six important renal abnormalities during the first year of life in babies who had been clinically normal at birth. All had had routine antenatal ultrasound scanning, four after 19 weeks' gestation.

I would be interested to see an analysis of the follow up of the 88 fetuses with "unilateral hydronephrosis; pelvic diameter 6-10 mm." I suspect that in many this was transient or clinically unimportant pyelectasis.

JOHN BROOMHALL

Torbay Hospital,
Torquay TQ2 7AA

1 Luck CA. Value of routine ultrasound scanning at 19 weeks: a four year study of 8849 deliveries. *BMJ* 1992;304:1474-8. (6 June.)

2 Livera LN, Brookfield DSK, Eggington JA, Hawnaur JM. Antenatal ultrasonography to detect fetal renal abnormalities: a prospective screening programme. *BMJ* 1989;298:1421-3.

3 Chitty LS, Hunt GH, Moore J, Lobb MO. Effectiveness of routine ultrasonography in detecting fetal structural abnormalities in a low risk population. *BMJ* 1991;303:1165-9.

EDITOR,—Carole A Luck fails to discuss what malformations were considered to be detectable by ultrasound scanning before the study started and how the malformations were diagnosed—that is, what the gold standard was for establishing which babies had malformations.¹ We have to assume that she was trying to diagnose all malformations. If this is the case the overall rate of malformations is low (166/8849) and their distribution unusual (for example, 105 of the 166 malformations were malformations of the renal system).

The reason for this is that in most cases the test being evaluated (ultrasound scanning) was the means by which the malformation was diagnosed (the gold standard) so it is not surprising that the test seemed to perform well. For example, three babies were diagnosed by ultrasound scanning as having posterior urethral valves. At birth none of them had valves, although one of them had appreciable reflux. All three babies are listed in the results as having posterior urethral valves. Eighty eight babies were diagnosed as having mild unilateral hydronephrosis. The proportion of these babies who would have presented in the neonatal period with clinical evidence of urinary tract problems cannot be estimated from this study. They are all listed as babies with malformations

correctly diagnosed by ultrasound scanning. Consequently, for malformations of the renal system ultrasound scanning is reported to have a sensitivity and specificity of 100% and positive and negative predictive values of 100% too.

To evaluate properly the performance of antenatal ultrasound scanning in diagnosing malformations there needs to be agreement about which malformations will be assessed as detectable by the test; in addition, the diagnoses must be made with a gold standard that is independent of the scanning—for example, necropsy reports for lethal malformations and independent clinical assessments for non-lethal malformations. If the results of scanning are used to define outcome there is great potential for creating false positive findings. The impact that this has on the babies and their parents must be considered.

Evaluating the effectiveness of routine ultrasound scanning in diagnosing malformations is important. We believe it merits much closer attention to strict methodology.

ROBIN BELL

JUDITH LUMLEY

Centre for the Study of Mothers' and Children's Health,
Carlton,
Victoria 3053,
Australia

1 Luck CA. Value of routine ultrasound scanning at 19 weeks: a four year study of 8849 deliveries. *BMJ* 1992;305:1474-8. (6 June.)

AUTHOR'S REPLY,—Our study was prospective, and we were unaware of all the malformations that could be diagnosed when it was initiated. All the lethal anomalies were confirmed at postmortem examination. The non-lethal anomalies were confirmed clinically and by investigation postnatally.

I agree that the sensitivity is distorted by the many minor renal anomalies included in the series and that including sensitivity figures seems to give a bias in favour of a high overall rate of detection of anomalies. For this reason I did not include sensitivities when I initially submitted the paper, but the referee thought they were necessary for statistical reasons.

No child in this four year study has presented to the paediatricians at Heatherwood Hospital after delivery with renal anomalies detectable by ultrasound scanning. The renal disease that has presented has been associated with vesicoureteric reflux and non-dilated systems. I have reviewed the cases of unilateral hydronephrosis detected in 1990. Thirty five cases were found at 19 weeks. In two the renal pelvic diameter was >10 mm (because of obstruction of the pelviureteric junction in one and non-refluxing, non-obstructive megaureter in the other). In 33 cases the renal pelvic diameter was <10 mm. It is our policy to scan these infants 72 hours after delivery. If this scan also shows an abnormality investigations are instigated. If the scan is normal the infant has a final scan at 6 weeks. Of the 33 children with pelvic diameters of 6-10 mm, five had obstruction of the pelviureteric junction; three had vesicoureteric reflux; one had a non-refluxing, non-obstructive megaureter; and one had a ureterocele with a dysplastic kidney. I suggest to M J Whittle that 12 of these children had rather more than minor renal anomalies and that the antenatal ultrasound scans enabled prevention of later morbidity.

The five children with obstruction of the pelviureteric junction (6-10 mm) at 19 weeks were given prophylactic antibiotics. In one this treatment was stopped after three months and the child presented with a urinary tract infection at 6 months. One child had a breakthrough infection, and another also presented with a urinary tract infection but poor compliance was found.

In the three children thought to have posterior urethral valves antenatally the paediatric urologist

considered that there was sufficient diagnostic evidence postnatally to confirm that an appreciable obstruction of the urethra had been present antenatally; "blown valves" were thus diagnosed independently.

I did not wish to mask the fact that only just over a third of cardiac malformations were detected. I tried to emphasise that our scanning policy changed because of the results of the study. Most of the undetected cardiac defects arose in the first three years of the four year series, when only four chamber views were examined. Inflow and outflow tracts are now checked as well and, as a result, most of the cardiac defects were detected in the last year of the study.

I apologise for omitting the time taken for each scan and agree that it is important in assessing both performance and cost benefit. We use high quality ultrasound equipment, and 15 minutes is now allowed for each scan at 19 weeks; the actual scanning time is on average 10 minutes per patient.

C A LUCK

Department of Diagnostic Imaging,
Heatherwood Hospital,
Ascot,
Berkshire SL5 8AA

Adjuvant therapy for rectal cancer

EDITOR,—R H J Begent proposes recommendations for the adjuvant treatment of rectal cancer.¹ These suggest that adjuvant radiotherapy and chemotherapy should be prescribed for tumours of Dukes's stages B and C. The author states that several trials of different aspects of adjuvant chemotherapy and radiotherapy are in progress and that the most constructive approach would be to enter patients into these. I agree with this but believe that there is still insufficient evidence to support the use of adjuvant radiotherapy or radiotherapy and chemotherapy.

There has been a trend towards improved local control in the many published large randomised trials of preoperative or postoperative radiotherapy. Only the European Organisation for Research and Treatment of Cancer study² and the Stockholm study³ found a significant difference. Both used preoperative radiotherapy, and included the para-aortic nodes in addition to the pelvis, versus no radiotherapy. In the Stockholm trial there was a significant increase in the incidence of perineal wound infection and dehiscence (26% v 19%). The postoperative mortality was also significantly higher in the group given preoperative radiotherapy (8% v 2%), but there was no difference in overall survival. To try to limit morbidity the European Organisation for Research and Treatment of Cancer trial was open only to patients below the age of 70.

The North Central Cancer Treatment Group's trial is quoted as evidence for a survival advantage associated with combined chemotherapy and postoperative radiotherapy,⁴ and the updated Gastrointestinal Tumour Study Group's study supports this.⁵ But the North Central Cancer Treatment Group's study compared radiotherapy alone with the combination of radiotherapy and chemotherapy without a no treatment arm. The Gastrointestinal Tumour Study Group's study did include a no treatment arm as well as chemotherapy alone and radiotherapy alone, and the difference in survival in the group given the combination versus the group given no treatment was significant at seven years. The chemotherapy regimen was toxic and protracted, lasting 18 months. It was poorly tolerated, with only 65% of patients completing the course and an overall incidence of severe toxicity of 62%.

There are certainly grounds for further study. Though I understand the view that all patients