described, and fully as justified as in those patients with known hyperacidity who run the risk of post-operative erosion of the oesophagus (Lodge, 1955).

Summary

The occurrence of acute peptic ulceration in six previously eupeptic patients is described. The gastric lesion followed cerebral haemorrhage in two cases, diffuse encephalomyelitis in one, fractured neck of femur in one, and operation for carcinoma in two others. Post-mortem examination showed no evidence of previous ulceration, and the acute erosions have therefore been accepted as examples of the so-called stress ulcer. Though there is ample evidence to connect the neuro-endocrine system of the body with the development of stress ulcer, the exact mode of production is unknown. It is suggested that antacid therapy merits consideration in cases where trauma, operation, or cerebral lesions may initiate this dangerous sequence.

We are grateful to Professor D. M. Douglas and Professor A. C. Lendrum for helpful advice and criticism; to Dr. G. D. Malcolm for permission to publish Case 6; to Dr. J. A. Kirkland and Dr. R. S. Davidson for necropsy reports; and to Mr. J. W. Corkhill for the illustrations.

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The Minister of Health and the Minister of Agriculture, Fisheries and Food have issued jointly two codes of practice on the hygienic handling of meat in the retail trade and in course of transport. The codes, which have no statutory force, have two broad aims: the meat should be handled and transported under the best possible conditions, and those handling it should never through familiarity treat it with less care than they would expect to have been given to meat which they eat themselves. In addition to re-emphasizing the obvious requirements of hygiene, the codes give much common-sense advice about the construction of premises and their working. If all the recommendations are followed at least two familiar, even traditional, features of butchers' shops will disappear: dogs and sawdust. (No. 1, *Hygiene in the Retail Meat Trade*; No. 2, *The Hygienic Transport and Handling of Meat*. H.M.S.O., price 9d. each.)

HOME ON THE SECOND DAY: THE BRADFORD EXPERIMENT

THE COMBINED MATERNITY SCHEME*

BY

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The term "experiment" refers to the allocation of obstetric beds and not to any procedures carried out on patients. St. Luke's Maternity Hospital had 66 lying-in and 25 antenatal beds* with which to serve a city of 300,000 and to provide specialized hospital care for double that population. The average number of confinements in hospital is approximately 2,800 per annum. From 1947 to 1951 inclusive there were 71 cases of eclampsia and a large number of cases of pre-eclampsia in the hospital, and it was realized that the antenatal care would have to be improved.

In 1951 a pilot scheme was started at which most booked hypertensive patients were seen weekly from the 24th week of pregnancy until delivery. This proved so convincingly successful that towards the end of 1954 the hospital staff decided that all primigravidae, and those multigravidae who had shown any abnormality in previous pregnancies, and in particular either hypertension (H) or hypertension associated with proteinuria (HP), should be given such antenatal care. The faith and co-operation of Sister D. M. Holden made a start possible.

The underlying philosophy of this step was that whereas it is impossible to affect the number of patients with H (two readings of 140/90 mm. Hg or above before the onset of labour), it is possible to delay its onset, to lessen its severity, and to prevent it developing into HP or HP+. The most important time to detect these changes and to prevent them from becoming irreversible is between the 24th and the 34th week of pregnancy, for after that period adverse changes are less likely to occur, and, in any case, the infant will be viable. The means at our disposal to achieve the above ends are (1) to control weight-gain; (2) to detect early evidence of the onset of H, HP, and HP+; and (3) to encourage mothers with twin pregnancies to enter the antenatal ward for prolonged rest, to detect and treat the anaemias of pregnancy (physiological anaemia is not recognized), and to offer as much rest as possible for pregnant women with heart lesions. The logical developments in this trend of antenatal care would be to offer advice to potential mothers before they became pregnant and to establish the fact that antenatal rest is far more important than postnatal rest.

The indications laid down for immediate admission to the antenatal ward were: (a) blood-pressure of 140/90 mm. Hg, or a sudden rise in blood-pressure—for example, from 110/70 to 135/85 mm. Hg in one week; (b) proteinuria; (c) bleeding per vaginam; (d) the sudden onset of oedema either up to the knees

*Those mainly concerned with starting the above scheme.—*Local Health Authority*: Dr. J. Douglas (medical officer of health), Dr. W. Edgar (deputy medical officer of health), Dr. K. Horne (senior medical officer for maternity and child welfare), Dr. M. U. Rhodes (assistant medical officer for maternity and child welfare). *Hospital staff*: Mr. G. W. Theobald, Mr. G. A. Craig, Mr. A. C. Muir, Miss J. M. B. Muirhead (senior registrar), Dr. M. W. Arthurton (paediatrician). *General Practitioners*: Dr. R. H. Sunderland (chairman, obstetric committee), Dr. J. E. Allan, Dr. H. R. Sparrow, Dr. J. Wright.

or generalized; and (e) an increase in weight of more than 4 lb. (1.8 kg.) in a week.

The trend was away from stripping and palpating, and towards concentrating on measurements of blood-pressure, weight, haemoglobin, oedema, and proteinuria. It was agreed that there was no need to palpate the abdomen after the first thorough examination, when the patient was booked, until the 28th week of pregnancy, and then only to diagnose or exclude twins. The next palpation was not encouraged until the 34th to 35th week of pregnancy, when external version could be performed if the foetus presented by the breech. Each patient brought a specimen of urine with her. She was weighed in her clothes, and allowed home after her blood-pressure had been taken, unless anything wrong had been detected.

It was soon realized that there was not much purpose in detecting the patients who ought to be admitted if there were no beds for them, and that any increase in the number of antenatal beds would have to be at the expense of the lying-in beds. In spite of the fact that Bradford had a very low ratio of lying-in beds to population, the staff were so convinced of the necessity of increasing the number of antenatal beds that they took steps to increase them from 25 to 40, thus cutting down the lying-in beds to 51.

They realized that this would involve either decreasing the number of hospital deliveries or sending a considerable proportion of the patients home within 48 hours of delivery and that such changes would affect the local health authorities, not only of Bradford but of neighbouring boroughs, and the general practitioners. The Leeds Regional Hospital Board and the Bradford (A) Hospital Management Committee agreed to the plan provided it could be amicably implemented, while the Central Midwives Board offered no objection provided an adequate number of women stayed in hospital for 10 days so that the training of the pupil midwives would not be affected. The local health authorities had already become convinced of the desirability of trying such a scheme, and it remained to win the approbation of the general practitioners. The liaison committee suggested by the Ministry of Health's Circular 9/56, which had its first meeting in 1956, afforded the desired opportunity for this purpose. In due course the Bradford Maternity Medical Scheme came into existence with the good will of all concerned. It consisted of two main parts, the first dealing with domiciliary practice and the second with hospital practice.

The Domiciliary Contribution

In a letter sent by the Bradford Obstetric Committee to all general practitioners in the area on January 5, 1959, the following recommendations were made: (1) That the hospital standard of weekly antenatal care should be adopted. (2) That the practitioner should decide whether he would carry out the complete antenatal care of his patients or whether he would like the local authority (a) to take blood for the various laboratory tests and/or (b) to make agreed supplementary antenatal examinations. (3) That co-operation and personal record cards should be used in order to facilitate understanding between all concerned. In the first the general practitioner makes it clear what particular arrangement he favours. In the latter, relevant details concerning the general health and the pregnancy are recorded. The patient is requested to carry it in her bag and show it to those to whom she may be

referred. (4) That, in order to provide additional antenatal beds, suitable patients should be sent home to the care of their family doctors 48 hours after delivery. A card, suitable for hanging in the consulting-room and containing the following information and suggestions, was sent with the letter. This part of the scheme came into operation on January 12, 1959.

Contents of Card

Indications for Booking for Hospital Delivery

Primigravidae:

Age ..	Over 30.
" ..	18 years and under.
Height ..	4 ft. 10 in. (147 cm.) and under.
B.P. ..	Any reading in excess of 140/80 mm. Hg.
Weight ..	Any woman of "excess weight."
Infertility ..	"Trying" for three years or more.

Multigravidae:

Age ..	Any woman over 35.
Parity ..	Gravida-5 and over.
Spacing ..	10 years plus, since last baby (8 years+ regarded as G.1).

Previous Obstetric History:

"Toxaemia" of any kind.
Previous caesarean section.
Previous mid-cavity forceps.
Previous third-stage difficulties.
Rhesus-negative with antibodies.
No living issue.
2 or more miscarriages.

Previous Medical History:

Heart disease.
Tuberculosis.
Diabetes.
Bronchiectasis.
Chronic nephritis and pyelonephritis.
Thyrototoxicosis.
Epilepsy.
Mental instability.
Neurological conditions.

Operations:

Previous vaginal repair operations.

Orthopaedic abnormalities of pelvis, lower limbs, or spine.

It is suggested that women who have had more than one premature baby should be confined in hospital and that if any woman goes into premature labour the midwife should be authorized by her doctor to send the patient into hospital immediately, so that the infant can be nursed in the premature babies' unit. This is one of the reasons that mothers with twin pregnancies are admitted to hospital and are kept in for as long as possible before delivery.

Women who have had more than one miscarriage following another might be suffering from cervical incompetence which could be corrected by a Shirodkar operation.

Some multigravidae (5 and more) find it difficult to leave home for confinement in hospital. The staff is prepared to admit such women over the week-end for induction of labour. The husband can look after the family, and the woman herself will be sent home, if all goes well, within 48 hours.

It is suggested that women who have been in labour for 12 hours or more should either be sent to hospital or seen by a consultant.

The main task of antenatal care is to detect the following changes: (1) a sudden rise in the blood-pressure; (2) a sudden onset of marked oedema; (3) an increase of more than 2 lb. (0.9 kg.) in weight in any one week—it was thought desirable to regard 2 lb. as the critical gain in weight rather than 4 lb. (1.8 kg.) (see above); (4) the presence of proteinuria. All or any of the above signs are indications that the woman should be referred immediately for investigation in the antenatal ward.

All primigravidae and all multigravidae who had trouble in previous pregnancies are seen weekly in the antenatal clinic, and it is suggested that these patients cannot be seen too often.

The substances which are given routinely in the hospital antenatal clinic are: calciferol tablets (N.F.) 1, t.d.s., and ferrous sulphate compound tablets (N.F.) 1, t.d.s.

Some patients are given stilboestrol, 5 mg. t.d.s., in the hope of preventing the onset of premature labour, and most patients with hypertension are put on reserpine.

Simple Reducing Diet Sheet

To eat	Not to eat
Lean meat	Anything made with flour— for example, cakes, biscuits, bread
Fish (not fried)	Sweets
Eggs	Fried foods
Cheese	Cereals—for example, corn-flakes, porridge, rice, sago
Green vegetables	Potatoes
Fruit (not bananas)	
Starch-reduced bread or "energen" rolls.	

Resuscitation Van.—This is being used more frequently than ever and is available at the request of any doctor for all emergencies before, during, and after labour.

Liaison Between Consultants and General Practitioners.—All doctors practising in Bradford are welcome to attend the practice of St. Luke's Maternity Hospital, and doctors bringing in their own cases are invited to assist in their delivery. The staff of the hospital will be only too willing to fall in with any suggestions which the Bradford doctors may make to increase the existing liaison.

The Hospital Contribution

The hospital part of the scheme came into operation on March 16, 1958, when the antenatal beds were increased to 40 by the reduction of the lying-in beds to 51. During the first complete year of this arrangement 2,898 women were delivered of 2,969 babies, and 741 (26%) of these women were sent home within 48 hours to the care of their own general practitioners and to be visited by the domiciliary midwives. For some years previously, approximately 200 women had been discharged early because of shortage of beds, and the calculated increase in that number occasioned by losing 15 lying-in beds proved fairly accurate.

There were initial difficulties. Some women wanted to go home early, others did not. Often those thought fit for early discharge proved not to be, and substitution had to be hurriedly arranged. The rules laid down were that the baby had to be healthy and to weigh at least 6½ lb. (3 kg.), that the mother should be fit to move, and that the home conditions should be suitable.

One early mistake was not to discharge the maximum number of suitable women on the second day because there seemed to be plenty of beds. A sudden large number of deliveries then caused patients to be sent home between the fourth and sixth days of the puerperium, thus upsetting the essence of the scheme that the mother should go home either on the second or the tenth day of the puerperium.

When women are booked for hospital confinement they are now told that they may be discharged on the second day of the puerperium. The domiciliary midwives inspect all homes not only for the purpose of determining whether they are suitable for home confinement but also whether they are suitable for early discharge from hospital, and these opinions are noted on the patient's chart.

The matron, Miss G. Clayton, telephones the names of the women to be sent home the next day to the supervisor of midwives, Miss E. Entwistle, who informs the midwives concerned. They in turn are responsible for seeing that each home is ready to welcome both mother and baby and for informing their respective doctors. The success of the day-to-day working of the scheme has been largely due to these two ladies, who typify the co-operation which exists in the city between all those engaged in the practice of midwifery. Indeed, the bare bones of the tripartite administrative structure can be made to live only when clothed with the flesh of understanding and actuated by the spirit of co-operation.

Results of the First Year (March 16, 1958, to March 15, 1959)

Mothers.—The following figures apply until the 14th day of the puerperium. Of the 741 mothers discharged within 48 hours, three were readmitted—two because of secondary post-partum haemorrhage and one to the fever hospital because of pyrexia. 44 others required "medical aid," for the following reasons: mild pyrexia 20, engorged breasts 9, subinvolution of uterus 5, pain in leg 2, headaches 2, abdominal pain 2, sleeping badly 2, mental stress 1, boils 1.

Babies.—Four babies were admitted to the paediatric wards, and the following diagnoses were made: subendocardial fibroelastosis, staphylococcal ophthalmia neonatorum, physiological jaundice, and subdural haematoma. These all recovered and went home. No baby discharged on or before the second day died within the first 14 days of life. 54 required "medical aid" for the following reasons: watery eyes 18, purulent eye 1, snuffles 7, "mucousy" 3, spots 16, petechial rash 3, vomiting and loss of weight 3, cerebral cry 2, cyanotic attacks 1.

Conclusions

The co-operation of all concerned has made the early discharge of patients during the puerperium safe and practicable. It need hardly be mentioned that it would not have been feasible apart from frequent resort to induction of labour (over 800 times in 1958) made possible by the physiological oxytocin drip.

The initial misgivings on the part of the domiciliary midwives disappeared when it was realized that the number of domiciliary confinements would not be affected. Further, the extra burden of the nursing care of the mothers discharged on the second day was largely carried by part-time nurses who worked under the supervision of the midwives concerned. The loss of the maternity grant by these mothers in no way prejudiced the scheme, though this aspect of the problem is worthy of consideration.

In the English-speaking world, excluding the British Isles, nearly all confinements take place in hospital, and the mothers go home between the fourth and sixth days of the puerperium and receive no help either from midwife or health visitor. A strong section of paediatric opinion thinks that lactation should become established in one environment, and that the mother should either go home within 48 hours or wait until the 10th day. As there were over 600 emergency admissions of women booked for domiciliary confinement, and as some 50 visits were made by the flying squad, it would seem that hospital confinement is safer.

The danger of cross-infection, and in particular of the staphylococcus, caused the hospital staff in 1947 to encourage the mother to look after her own baby. She therefore does not get very much rest in hospital. Early discharge—and there is no reason why it should not take place at the end of 24 hours—disrupts home life as little as possible either physically or psychologically, and prevents healthy babies from becoming media for the hospital staphylococcus.

As one of the main reasons for increasing the number of antenatal beds was to prevent "toxaemia," the following facts are relevant. There has been only one maternal death in Bradford during the past seven years that was in any way connected with "toxaemia," and this in over 30,000 confinements. Neither mother nor

baby has been lost from eclampsia during the past four years. The perinatal mortality associated with hypertension (140/90 mm. Hg or over) in booked patients has been reduced to 3.6%, and that associated with all cases of toxæmia, booked and non-booked, to 5%.

The Cranbrook Report suggests that 70% of confinements should take place in hospital and that the normal stay should be 10 days. A further 70 lying-in beds would be required in Bradford alone to implement this suggestion, and the capital expenditure necessary throughout the Midlands and North of England would not be small. Neither would it be easy to obtain the necessary nursing staff.

Early discharge of patients has made it possible to improve antenatal care in Bradford and prevent toxæmia. It is not fraught with danger, could be economical, savours of common sense, and may indicate the future pattern of obstetrics. It will involve reorientation of obstetric and paediatric thought and the further development of the home-help service, possibly on a local and part-time basis.

Summary

The staff of St. Luke's Maternity Hospital, Bradford, became convinced that all primigravidae, together with those multigravidae who had shown abnormalities in previous pregnancies, should be seen weekly from the 24th week of pregnancy onwards. The underlying philosophy of this step was that whereas it is impossible to affect the number of patients with hypertension it is possible to delay its onset, to lessen its severity, and usually to prevent it from becoming associated with proteinuria. The most important time to detect these changes and to prevent them from becoming irreversible is between the 24th and 34th weeks of pregnancy.

It soon became evident that there was little use in detecting indications for admitting patients into the antenatal ward if no beds were available. As the total number of beds could not be increased it was obvious that the number of antenatal beds could only be increased by decreasing the number of lying-in beds. After prolonged negotiations it was agreed to increase the antenatal beds from 25 to 40, thus cutting down the number of lying-in beds to 51. This step involved either decreasing the number of hospital confinements or sending home a certain number of patients on the second day of the puerperium, and the latter alternative was accepted by all concerned.

During the first full year of the operation of this scheme, 2,898 women were delivered of 2,969 babies; and 741* (26%) of these women were sent home within 48 hours to the care of their own general practitioners and to be visited by the domiciliary midwives. None of these 741 babies was lost during the first 14 days of life and only four were admitted to the paediatric wards. Only three of these mothers were readmitted to hospital—two because of secondary post-partum haemorrhage and one to the fever hospital because of pyrexia.

It is relevant to report that there has been only one maternal death in Bradford during the past seven years which was in any way related to toxæmia and that

*Up to the end of September, 1959 (when the scheme had been in operation for 18 months), 1,381 mothers with their babies had been sent home within 48 hours of delivery, and only one baby had died during the first 14 days of life. That was a mature infant, delivered spontaneously, which died from cerebral haemorrhage. Those competent to judge state that this baby could not have been saved even if the mother had been kept in for 10 days.

neither mother nor baby has been lost from eclampsia during the past four years. It may be concluded that the combined maternity scheme agreed between hospital staff, local health authorities, and general practitioners has made it possible to improve antenatal care and almost to eliminate severe pregnancy toxæmia from the city. It is not fraught with danger to either mother or child, prevents the baby from becoming a culture medium for the hospital staphylococcus, could be economical, savours of common sense, and may indicate the future pattern of obstetrics. It will involve reorientation of obstetric and paediatric thought, and the further development of the home-help service, possibly on a local and part-time basis.

MALIGNANT HYPERTENSION AND HYPOKALAEMIA: CURED BY NEPHRECTOMY

BY

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The association of hypokalaemia and hypertension has attracted much attention since Conn (1955a, 1955b) described primary hyperaldosteronism and successfully predicted that some cases of potassium-losing renal disease would prove to have the same aetiology (Milne, 1955). The early patients were found to have an adrenal adenoma as the source of the increased aldosterone production, but there have been subsequent reports of patients with hyperaldosteronism and severe hypertension who proved to have adrenal enlargement but no tumour (Holten and Petersen, 1956). The interpretation of the aetiological importance of the enlarged adrenals in these cases is difficult in view of the known association of adrenal hypertrophy with severe hypertension (Dawson, 1956). Primary renal disease may be responsible for potassium loss, but this is usually associated with acidosis (Milne *et al.*, 1952), and not with alkalosis as occurs with uncomplicated potassium deficiency. Renal damage and pyelonephritis may indeed follow prolonged potassium depletion (Milne *et al.*, 1957). Prunty (1957) felt that there was no good evidence that hypokalaemia and alkalosis could be caused by renal disease alone.

The present paper concerns two patients with malignant hypertension and severe hypokalaemia who, after excision of a kidney with a narrowed artery, both recovered the ability to conserve potassium.

Case 1

The patient, a male newspaper correspondent aged 54, had enjoyed good health until three months before he was admitted to hospital. His first complaint was of headaches, which were particularly severe on waking. One week later, on account of an increase in their severity, he consulted his general practitioner, who found a blood-pressure of 240/140 mm. Hg and noted a retinal haemorrhage in the right