for Sick Children, Glasgow, during the last 5 years the condition has been seen most commonly in association with hypertonic dehydration. During this period 14 infants have been diagnosed as having renal venous thrombosis and in 6 of these the lesion was thought to be bilateral. All 14 infants were aged less than 6 months and in each the biochemical findings of hypertonic dehydration were present. In all infants renal enlargement and haematuria were detected and in 8 cases the renal enlargement was confirmed radiologically. 13 of the 14 infants studied had demonstrable thrombocytopenia and in 4 of these detailed serial coagulation studies were carried out. All infants received intravenous fluid therapy and 5 were treated with peritoneal dialysis. In 6 infants continuous intravenous heparin was administered during the acute stage of the illness. 7 infants are alive with normal renal function. One is alive but with impaired renal function bilaterally and one has required nephrectomy for systemic hypertension. 4 infants died during the acute stage of the illness and a further child died 15 months after the acute illness of unrelated disease, his kidneys being normal histologically at necropsy.

Combined Sessions with British Association of Paediatric Surgeons

J. WAGGET. Hospital for Sick Children, Newcastle. 'Parenteral feeding: surgical indications and techniques'. Intravenous feeding is indicated in any condition where feeding by the gastrointestinal tract is contraindicated for more than a few days, but where return to normal function can eventually be expected. Surgical cases include many of the congenital abnormalities, and any surgery of the gastrointestinal tract, complicated by sepsis, ileus, or fistulae formation which prevents normal feeding. In the past many such patients had increased morbidity and mortality, simply because of the added factor of starvation.

Our team effort in Newcastle is mainly directed towards newborn surgical patients, but our regimen can also be used in older children. It has been designed so that it can be given either by central or peripheral vein and it is flexible enough to allow for replacement of large gastrointestinal fluid, and electrolyte losses, where necessary. We use fat as one of the principal calorie sources, a crystalline amino acid solution, and a third solution which supplies dextrose plus extra electrolytes and vitamins. These three main solutions are infused by pump by a series of 'Y' connections. The metabolic problems associated with this unphysiological method of preventing starvation have been lessened since we have had a more balanced regimen whose constituents have been delivered to the patient steadily throughout the 24-hour period. The technique of preparing infusion set-up and its delivery to the patient were outlined.

M. PANTERBRICK. Newcastle. 'Parenteral feeding: metabolic changes'. This paper reported the personal experience with newborn surgical patients fed intravenously using a regimen which included fat, carbohydrate, and crystalline amino acids. The

regimen is designed so that it can be given either by peripheral vein or into the central venous system. Emphasis was given to phosphate requirements and amino acid patterns during infusion and their relation to acid-base status.

J. T. HARRIES. Institute of Child Health and The Hospital for Sick Children, Great Ormond Street, London. 'Parenteral feeding—complications'. Intravenous feeding represents an important advance in the management of certain conditions, but the serious complications limit the more widespread use of this form of treatment at present. Cumulative data suggest that complication rates may be as high as 60–70%. The following complications have been reported.

(1) *Septicaemia*. The commonest infecting organisms are *Candida albicans*, *Staphylococcus aureus*, and *albus*, and other Gram-negative bacteria. Risk of septicaemia is increased when using I.V. catheters, particularly if placed in central veins, and all peripheral veins should be utilized before resorting to central ones. A strict aseptic technique is probably the most important single factor in prevention. (2) *Metabolic acidosis*. Severe lactic acidosis may follow fructose infusions in hepatic disease or anoxic states, particularly if infusate contains ethanol (e.g. Aminosol-fructose-ethanol). High titratable acidity of some amino acid infusates may also induce acidosis. Dehydration, anoxia, and electrolyte imbalance must be corrected before initiating I.V. feeding; controlled infusion rates and frequent biochemical monitoring are essential during I.V. feeding. (3) *Hypophosphataemia*, despite phosphate supplementation, may lead to haemolytic anaemia, weakness, and seizures. Phosphate consumption during anabolic phase may contribute to pathophysiology of hypophosphataemia. (4) *Phlebitis and venous obstruction* secondary to hypertonicity and H^+ ion concentration of infusates, and/or infection. Frequency may be reduced by inclusion of isotonic fat emulsion in regimen. (5) *Catheter dislodgement and extravasation of fluid*. Correct initial catheter placement and subsequent careful handling important; extravasation of hypertonic solutions may cause tissue necrosis and secondary infection. (6) *Hypoglycaemia* with severe hypothermia may follow abrupt termination of I.V. feeding. (7) *Fluid retention* with cardiac failure may accompany infusions of amino acid solutions due to high sodium concentration. (8) *Dehydration* secondary to osmotic diuresis particularly likely to occur during introduction of hypertonic infusates (e.g. osmolality of Aminosol-fructose-ethanol and Vamin = 1975 and 1275 mOsm/kg, respectively). (9) *Hyperuricaemia* due to increased hepatic synthesis or uric acid may accompany fructose infusions. (10) *Hypocalcaemia, hypokalaemia, hepatic dysfunction, and thrombocytopenia* may also complicate I.V. feeding.

With increasing experience of I.V. feeding additional complications will undoubtedly become recognized.

P. M. DUNN. Southmead Hospital, Bristol. 'Congenital sternomastoid torticollis: an intrauterine postural