which babies have to be reared than by studying their morbid pathology. Liaison should not be an end in itself but an integral part of the infant services, and it cannot be planned as a separate entity. Regard must be paid to these principles if liaison is to be effective.

Methods of Attaining Liaison

Through the courtesy of colleagues working in certain other areas I have had an opportunity of studying methods of attaining liaison there. In general, the usual practice seems to be for the maternity unit or hospital to inform the public health department of the impending discharge of a baby, to furnish a short report on the child, and to request, where necessary, for an early call to be made by the health visitor. It is no mere carping criticism to say that such "liaison" could hardly be effective. The clinician is quite unaware of the home environment: a child may be discharged to grossly unsatisfactory home conditions, and irretrievable damage may be done before the health visitor calls.

With these thoughts in mind a trial scheme was introduced in this area, based on the principles stated above. It would be premature to describe its detailed working or the results to date, but after five months' experience it has worked well. It involves the following matters.

(1) The unofficial reporting of pregnancies to the public health department by antenatal clinics and domiciliary midwives.

(2) Following on (1), the early investigation of the social, economic, and environmental characteristics of the families and households into which a baby is to be born.

(3) Based on (2), the ascertainment of observation households as early in pregnancy as possible and the maintenance in the public health department of a list of such households.

(4) Attempts to counteract or ameliorate the adverse conditions discovered to be present in observation households.

(5) The checking off of all birth notifications against the list of observation households, so that the birth of the baby into an observation household is known immediately it occurs.

(6) Where the birth of a baby from an observation household (observation baby) occurs in hospital, an immediate written report on the home circumstances is sent to the hospital doctor, who is thus made aware of the home background.

(7) When a baby under 1 year old is admitted to hospital for an illness the fact is reported to the public health department. If the baby is found to be from an observation household a report on the home conditions is sent to the hospital doctor.

(8) When a baby from an observation household (either born in hospital or subsequently admitted) is considered to be ready for discharge, a discussion takes place between the hospital doctor and the medical officer of health with special reference to the question of cross-infection and the adverse home environment.

This scheme, here briefly described, is not devoid of administrative difficulties, but these can be ironed out. It places the onus for initiating liaison on the public health department, where it should rightly belong, and makes the medical officer of health responsible for reporting to the hospital when the home environment is not satisfactory—a function which is properly his. The problem of effective liaison is put in its right perspective; it is not regarded as a separate entity, but is co-ordinated with the other aspects of the plan. It is hoped, moreover, by the ascertainment, investigation, and follow-up of observation families and babies to collect information which will throw light on those sociological factors known to maintain a high infant mortality rate. With the coming cleavage between the hospital and domiciliary services it will be the more necessary for liaison and co-ordination to be placed on a solid basis.

Summary

The need for close liaison between maternity units and hospital and home services, especially public health departments, is emphasized by describing case histories where lack of liaison might have resulted in an infant death.

The principles underlying effective liaison are discussed. There are households where the successful rearing of a baby is made hazardous by specified adverse environmental conditions, and in such cases it may be necessary (pending the provision of suitable *ad hoc* hostels) to retain mother and baby in hospital for a period. In such cases the risk of cross-infection must be balanced against the dangers of the home environment. In all such cases a full

report on the home conditions and environment should be supplied to the hospital doctor by the medical officer of health.

A trial scheme is briefly described by which effective liaison and co-ordination may be attained as an integral part of the infant health service.

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OBSERVATIONS ON VASCULAR INJURIES

WITH SPECIAL REFERENCE TO THE VALUE OF SYMPATHECTOMY IN LIGATION OF MAIN VESSELS*

BY

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My experience of vascular injuries is limited to those cases reaching a base hospital in Egypt between October, 1942, and October, 1945, consisting principally of aneurysms. A few recent injuries of blood vessels due to local shooting and stabbing affrays were admitted, and there were a few secondary haemorrhages requiring ligation of main vessels.

Altogether 41 main arteries were ligated. With one exception every case was submitted to sympathectomy 14 days before or at the time of operation on the artery. Prof. Paterson Ross, at Hill End Hospital, for one reason or another ligated 15 main vessels, also preceded by sympathectomy. It is with the results of ligation of primary arteries that I wish to deal here. The solitary point I hope to make is that ligation of a main vessel should be accompanied by sympathetic denervation of the limb. Ligation of the main artery of a limb carries with it a considerable risk of gangrene. This is especially so in gunshot wounds because, as a rule, many collateral vessels are injured at the same time. Sir George Makins collected a series in the war of 1914-18 in which the primary artery had been ligated and the fate of the limb left to the collateral blood flow. The percentages of cases complicated by gangrene according to arteries involved were as follows:

TABLE I

Subclavian	25%	Femoral	25%
Axillary	16.6%	Popliteal	41.6%
Brachial	23%		

Averaging these cases, gangrene occurred in 26%. The popliteal artery is especially dangerous. Most surgeons would agree that ligation carries a risk of at least 40%, and many would assess the risk considerably higher. Apart from frank gangrene, depleted blood flow leads to ischaemic necrosis of muscles with crippling contractures, fibrosis, wasting of muscles, and nerve palsies. Even if these grosser manifestations are not seen, inadequate blood supply to the muscles is revealed in the lower extremities by intermittent claudication. The fate of the limb after ligation depends on the collateral circulation. Every effort must be made to expand it quickly. Blood pressure must be maintained by transfusion. The limb should be kept below the level of the heart by blocks under the head of the bed. The affected limb should be kept cool and the rest of the body warm to aid sympathetic release. The surest method of

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dilatation of the collateral circulation is by sympathectomy. It has been practised in America for many years. Gage and Ochsner (1940) have carried out sympathetic block in all cases of traumatic injuries to blood vessels, and in operations for aneurysm since 1930, without the occurrence of a single case of gangrene. British surgeons seem to be suspicious of sympathectomy largely because of the inability of physiologists to reconcile this procedure with the results of their researches on the experimental cat and dog. It has become the fashion to doubt the value of operations on the sympathetic nervous system. It has been stated that stimulation of the sympathetic leads to vasoconstriction in the skin but increased blood flow to the muscles, sympathetic block to increased blood flow to the skin but reduced flow to muscles. The points were stressed in a paper by Siddons (1945) condemning sympathetic block. There are, however, certain solid facts in favour of the value of sympathectomy: (1) In spite of the deductions of the laboratory worker in the experimental animal it is well known clinically that sympathectomy will improve intermittent claudication; (2) Theis (1933) has shown convincingly in animal experiments that sympathectomy increases the total in-flow to a limb and increases the collateral circulation after ligation of a main vessel. Barcroft and Edholm (1943) have shown that there are vasoconstrictor fibres to the blood vessels supplying muscles in man. There is, in fact, a weight of clinical and also some experimental evidence that sympathetic denervation improves the circulation to the whole limb—muscle as well as skin. Three cases of main-vessel ligation in forward areas without gangrene but with severe claudication were admitted to hospital: one patient with common iliac ligation, able to walk only 10 yards (9 m.) without cramp, one popliteal and one femoral ligation, all "claudicating" under 100 yards (90 m.). They were submitted to lumbar ganglionectomy and were able to walk half a mile (0.8 km.) on leaving hospital. I have ligated 41 main vessels. In 40 of them a sympathectomy was carried out either at the time of ligation or a fortnight before; most of them were not simple ligations but excisions of long segments. Twice I have performed triple ligation with excision of the common femoral, superficial, and deep femoral arteries. Next day, in both cases, the foot on that side was appreciably warmer than the other. The popliteal artery has been ligated and portions excised at all levels in its length. In this series there was one example of gangrene following excision of an arterio-venous aneurysm at the adductor opening. This man, an Italian P.O.W., had multiple wounds round the knee; many of the collateral vessels had been divided. Clinically the peripheral circulation in both legs was very poor. In the only case not submitted to sympathectomy in this series ischaemic necrosis of the forearm muscles occurred.

TABLE II.—Ligation of Main Arteries

External iliac ..	9	Subclavian ..	4
Common femoral ..	4	Axillary ..	4
Superficial femoral ..	6	Brachial ..	5
Popliteal ..	9		

Traumatic False Aneurysm

Our experience of this condition is limited to 15 cases. It is usually stated that operation should be delayed for three months in order that a good collateral circulation may form. While this policy may be sound, it seldom seems possible. In my

TABLE III

Common femoral ..	3	Subclavian ..	2
Superficial femoral ..	2	Axillary ..	2
Popliteal ..	3	Brachial ..	3

series 13 out of 15 had to be operated upon before the optimum time because of external haemorrhage, progressive enlargement with threat of rupture, nerve compression, and in one case infection. Other surgeons have had similar experiences. I rather doubt the soundness of the policy of waiting for a collateral circulation to develop. A few arteriographs of aneurysms that I have made have not shown the characteristic tortuous vessels that are usually seen in arteriographs of main-vessel thromboses. The hypertrophied vessels that do form seem to be around and in connexion with the sac, and are of necessity injured during operation. In two cases operation had to be carried out as an emergency for external haemorrhage between the second and fourth weeks while the aneurysm was

only just out of the pulsating arterial haematoma stage. I was much impressed by the ease of operation. Soft clot was mopped away and the vessel could be easily identified and tied through the floor of the sac. Owing to the extreme difficulty of operation between the fourth and tenth weeks, and the fact that the surgeon's hand is so often forced by complications to operate during this difficult period, I am persuaded that to operate upon them between the second and fourth weeks is preferable to waiting until a later date. I do not believe that the increased collateral circulation is worth waiting for. Relief of tension by operation combined with vasodilatation by sympathectomy should be adequate.

Arterio-venous Aneurysms

I have operated on 13 arterio-venous aneurysms of the limbs. I have only one observation to make about the diagnosis, and that is the extreme difficulty in deciding before exploration what vessels are involved. Complications necessitating early

TABLE IV

Common femoral ..	2	Subclavian ..	2
Superficial femoral ..	3	Axillary ..	2
Popliteal ..	3	Brachial ..	1

operation are unlikely to occur in arterio-venous aneurysms, and therefore it is possible to wait six months or longer before exploration. A quadruple ligation accompanied by sympathectomy was the routine procedure, with excision of the sac where possible without damage to neighbouring structures. In one case of arterio-venous aneurysm of the first part of the right subclavian sympathectomy was impossible owing to dense adhesions around the apex of the lung. Ischaemic contracture of the forearm muscles occurred.

Late Results

Out of Prof. Ross's 14 cases in which leg arteries had been tied with sympathectomy 11 have been seen again more than six months after operation. In all cases nutrition of the limb was excellent. The patients could all walk at an ordinary pace for three miles (4.8 km.) without claudication. Four complained of claudication if they walked fast. In assessing the late results insufficient attention has been paid to disability following ligation of a main vein (Ross, 1946), the symptoms of which have sometimes been misinterpreted as the result of arterial ligation.

Conclusions

If operation is planned for ligation of a main artery sympathectomy should be carried out.

If ligation is carried out in an emergency, sympathectomy should be done at the same time or as soon as possible afterwards.

In traumatic false aneurysm operation should be performed two to four weeks after injury, accompanied by sympathectomy.

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The population increase of the Middle East is touched on by PEP in their recently issued pamphlet *Basic Problems in the Middle East*. Famine, war, and disease have for long been the most important limiting factors; in addition scarcity of water prevents habitation of many areas. Improved systems of cultivation, the introduction of forestry in Cyprus, and the setting up of industries all contribute to raising the standard of living; but between the beginning of this advancement and the point where raised cultural standards themselves limit population growth there may be a long period of overcrowding and all the suffering that ensues from it. That the problem is not insuperable seems indicated by the experience of Japan, where the population has greatly increased in recent decades without an appreciable depression of living standards. On the other hand the situation in India is grave indeed, as Sir John Megaw pointed out in a letter to this *Journal* on June 29, 1946. Detailed population studies are required for all these countries. In Sudan, for example, traditional methods of estimating the population have given figures that in some areas may be 50% inaccurate.