(43.3° C.). This removed small fragments of tissue missed by the forceps and also stimulated uterine contractions, as shown by the rapid decrease in the length of the uterine cavity and the cessation of any bleeding. The cavity was then packed with a sterile 2-in. (5-cm.) gauze roll, which was removed six hours later. In septic cases the pack was impregnated with 10 g. of sulphathiazole powder. This pack serves a dual function. By promoting uterine contractions and by direct pressure on the placental site it safeguards against further bleeding during the stage of recovery from the anaesthetic, and with its removal it clears any small fragments or clot which if left could promote discharge, further haemorrhage, and possibly infection. Following the removal of the pack there was rarely more than a slight stained discharge, which usually ceased within forty-eight to seventy-two hours of the operation. The patient was allowed up thirty-six to forty-eight hours later, and if the home conditions were satisfactory was discharged on the third or fourth day. An attempt was made to discover the cause of the abortion, and advice was given on the necessary care during the early weeks of a subsequent pregnancy. Iron was given to combat anaemia secondary to the blood loss, and the patient was requested to report for a follow-up examination in a month.

Results

There was one death in the series, the patient being one of the two whose abortion was complicated by a generalized *Cl. welchii* infection. This patient was considered to be moribund on admission. Abortion had occurred one month previously, and following this there had been daily haemorrhage until at the time of admission the haemoglobin level was 22%. Because of the state of collapse and the general appearance of the patient a provisional diagnosis of gas-gangrene infection was made, and treatment was instituted with serum in addition to transfusion and chemotherapy pending the report of the bacteriologist on the high vaginal swab. Death occurred within twenty-four hours of admission, and necropsy confirmed the presence of *Cl. welchii* septicaemia.

As already stated, it was common for patients with suitable home facilities to be discharged on the third or fourth day. The average length of stay in hospital was 7.5 days for the 500 non-private patients.

Summary and Conclusions

Six hundred consecutive incomplete, inevitable, and septic abortions treated by surgical evacuation of the uterus followed by the insertion of a pack for six hours are analysed.

Forty-two patients were infected on admission—two with *Cl. welchii*. In all infected cases specific chemotherapy was started before evacuating the uterus.

Seventy-one transfusions were given; the average stay in hospital was 7.5 days; and there was one death in the series—a mortality of 0.17%.

Surgical evacuation of the uterus in inevitable, incomplete, and septic abortion, if carefully performed, provides a safe and efficient method of treating the condition.

The method advocated reduces the length of stay in hospital—an important factor in these days of acute shortage of beds.

The low mortality (1 in 600) may be attributed to the method of treatment and to the fact that a team skilled in handling these cases was responsible for them. Routine treatment is easy to prescribe, but on the nice decision of when to administer it may hang the balance between life and death.

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WORK OF A TUBERCULOSIS CONTACT CLINIC FOR YOUNG CHILDREN, 1941-5

BY

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In Newcastle-upon-Tyne, where the mortality from tuberculosis has always been above the average for the country, 150 children under the age of 5 years died from that disease between 1931 and 1940. In 1941, therefore, as part of a policy of investigating the causes of death in infancy and early childhood, a clinic was established for the observation and care of children under the age of 5 years who were known to have been in contact with tuberculosis. The object was to obtain information concerning the mortality and morbidity of tuberculosis in children of families containing a notified case of the disease and to ascertain the relation which this bears to the total mortality and morbidity for the same age group within the city. With this information it was hoped that it would be possible to estimate the accommodation required in Newcastle-upon-Tyne for the care of such young children.

This clinic resembles closely the diagnostic clinic for childhood tuberculosis suggested in the British Paediatric Association Report in 1943, and it seems appropriate to give a preliminary survey of the first 4½ years' work in order to show the usefulness of the investigation and the part which a clinic of this nature can play in a city tuberculosis service. This report covers the period June, 1941, to December, 1945, and the children were under 5 years of age when first examined.

Organization of the Clinic

The work is carried out by arrangement with the tuberculosis medical officer in a special clinic established in the children's department of the Newcastle-upon-Tyne General Hospital. *X*-ray facilities are available and parents are more willing to bring young children to such a clinic than they are to take them to a tuberculosis dispensary. Full information concerning children in infected families is sent each week to the clinic from the tuberculosis medical officer, and this is the starting-point for the observation.

For the first six months, until January, 1942, the homes of the children were visited by a health visitor of the City Child Welfare Department chosen for this work; the health visitor explained the purpose of the visit and did a tuberculin patch test. If the test was positive the parents were asked to bring the child to the clinic for clinical and radiological examination. At the beginning of 1942 this arrangement was changed. All the children are now visited and their parents are asked to bring them for examination (tram or bus fares are paid when this seems necessary). The patch test was abandoned and the intradermal Mantoux test (0.1 ml. of 1 in 1,000 old tuberculin) is used as a routine; every child is radiographed.

During the war years demands upon the time of mothers of young children became heavy, and especially so with illness in the house. From the outset, therefore, the work was organized to avoid waste of time in hospital or unnecessary return journeys to the clinic. The tuberculin test done at the first visit is read either by the health visitor calling at the house on the third day or by the doctor at the welfare centre nearest the child's home. When the result is known the clinical, radiological, and social findings

are correlated and a decision made concerning any action required; the parents are notified by letter of the results of the examination, and are told if we wish to discuss the matter further and when we wish to see the child again. For return visits a further letter is sent about seven days before the visit is due. At the same time a complete report is sent to the tuberculosis medical officer and the family doctor. The interval that elapses between visits is not fixed but is related to the risk under which the child is living.

So far the response of the parents has been very good and appreciative. Only 10% have failed to attend. A few have not been interested; one or two wished to have a "private opinion"; but the most common cause of failure seems to be fear of tuberculosis and unwillingness to face the possible consequences of examination. An explanation of the examination and of the skin test is made at the visit and everything is done to ensure that the parents understand its significance.

Failure to react to 1 in 1,000 dilution of old tuberculin by intradermal injection has been accepted as negative, and stronger solutions have not been used. Every care is taken in the technique of injection and the management of the individual child, but my experience has not coincided with that of Gaisford (1946), who states that this test can be used without disturbing the children. Indeed, I am sure that a tuberculin test which avoids the use of an injection is most desirable and is particularly important when repeated tests are required; the modified jelly test as described by Deane (1946) might be the best method of meeting this difficulty, and the intradermal test would be used only when the result of the percutaneous test was not conclusive.

Notification is always a difficulty, and in our work only cases admitted to hospital or sanatorium have been notified as suffering from tuberculosis. This difficulty has been discussed previously by Moncrieff (1945) and in the British Paediatric Association Report (1943). The blood sedimentation rate has not been used.

Results

From June, 1941, to December, 1945, we received information concerning 569 children and we examined 520 at least once. Table I shows the frequency of exposure to various forms of tuberculosis. Table II gives the results of the first tuberculin reaction in children in contact with pulmonary tuberculosis and shows that half those in contact with "open" pulmonary tuberculosis and one-fifth of those in contact with "closed" pulmonary cases were positive when first examined. At subsequent examinations 35 of these children were observed to become tuberculin-positive, but the difficulties and staff shortages of 1943 and 1944 made it impossible to obtain the complete tuberculin conversion numbers for the whole group. Of 142 positive reactors at the first examination 110 came from known sputum-positive cases and 32 from "negative cases"; of 227 negative reactors 103 were contacts of sputum-positive cases and 124 of sputum-negative cases. The fact that half the children examined after contact with open pulmonary tuberculosis were still tuberculin-negative when first examined is of extraordinary interest.

TABLE I.—*Number of Children in Various Age Groups and the Types of Tuberculosis to which they had been Exposed*

Age Group	Total in Group	Type of Tuberculosis in Index Case								
		Pulmonary	Lymphatic All Types	Serous Pleural Effusion	Bone	Abdominal	Renal	Miliary	Meningeal	Skin
0–1	109	88	5	8	3	3	—	1	—	1
1–2	96	72	12	5	4	1	—	—	2	—
2–3	101	55	11	19	13	2	—	—	—	1
3–4	115	88	8	10	5	3	1	—	—	—
4–5	99	66	13	10	3	4	1	2	—	—
	520	369	49	52	28	13	2	3	2	2

TABLE II.—*The Results of First Tuberculin Test in Children in Contact with Pulmonary Tuberculosis*

Age of Child	Index Case: Positive Sputum	Tuberculin Test		Index Case: Negative or No Sputum	Tuberculin Test		Total Tuberculin Positive
		Pos.	Neg.		Pos.	Neg.	
0–1	42	15	27	46	3	43	18 (20·5%)
1–2	42	21	21	30	4	26	25 (34·7%)
2–3	36	19	17	19	9	10	28 (50·9%)
3–4	55	27	28	33	8	25	35 (39·7%)
4–5	38	28	10	28	8	20	36 (54·5%)
	213	110 (51·6%)	103	156	32 (20·5%)	124	142 (38·5%)

Results of the examination of contacts of cases of tuberculosis other than pulmonary are given in Table III; only 12 out of 151 were positive at the first examination and only six were subsequently known to become positive.

TABLE III.—*Results of First Tuberculin Tests upon Contacts of Index Cases Suffering from Forms of Tuberculosis other than Pulmonary*

Age Group	Serous Effusion		Lymphatic Tuberculosis		Bone Tuberculosis		Abdominal Tuberculosis		Other Forms	
	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.	Pos.	Neg.
0–1	—	8	—	5	—	3	—	3	—	2
1–2	—	5	1	11	—	4	—	1	1	1
2–3	2	17	2	9	1	12	—	2	—	1
3–4	—	10	—	8	—	5	—	3	—	1
4–5	1	9	3	10	—	3	1	3	—	3
	3	49	6	43	1	27	1	12	1	8

Hospital Admissions and Mortality

Thompson (1944) has stated, and I agree, that there is little or nothing which can be done in hospital for children with symptomless primary tuberculosis which cannot be done in a *good* home, and the only reasons for admission to hospital are unfavourable home conditions or the absence of any other method of separation from infection. Under the circumstances which existed during the years 1941–5 we could not admit children to hospital or other institutions to prevent initial infection or further exposure, and our criteria for admission have been clinical symptoms such as cough, wheezing, and loss of weight, progressive extension of radiological shadows, bone tuberculosis, or extremely adverse social conditions during the early phase of tuberculous infection, when the condition is most likely to become generalized.

Of the group of 369 children who had been in contact with pulmonary tuberculosis 57 were admitted to hospital for one of the reasons given above and a further eight were admitted with acute disseminated tuberculosis or tuberculous meningitis. These 65 children represented at least 30% of all children under the age of 5 years admitted to city hospitals for tuberculosis within the same time.

The mortality of the same group of 369 children exposed to pulmonary tuberculosis has been 5% (19) to the end of 1945 (Table IV)—significant enough to make the use of the word "benign" in connexion with childhood tuberculosis a very dangerous procedure. Of the group in contact with pulmonary tuberculosis 17 died in hospital from proved tuberculosis, two died at home with illnesses which were probably tuberculous, and at a recent follow-up of the families concerned it was found that four other children who had not been examined because they were born after the original notification had died of proved tuberculous

meningitis. Thus in 320 families containing an adult with pulmonary tuberculosis there was a minimum of 21 deaths of young children in 4½ years.

TABLE IV.—*Age Distribution of Deaths from Tuberculosis Occurring in 369 Children Contacts of Pulmonary Tuberculosis Exposed Between June, 1941, and December, 1945 (Positive and Negative Sputum)*

Age at First Exposure	No. of Children Exposed	Deaths to December, 1945
0–1	88	8 (9·0%) } (7·5%)
1–2	72	4 (5·5%) }
2–3	55	2 (3·6%) }
3–4	88	4 (4·5%) } (3·4%)
4–5	66	1 (1·5%) }
	369	19 (5·0%)

The distribution of the deaths in relation to the age of the child at first exposure is shown in Table IV, confirming the well-recognized fact that the risk of exposure is greatest in the first year and decreases as age advances, with a marked fall after the age of 2 years.

During the time under consideration there were 66 deaths from tuberculosis in the 18,000 children under 5 years in the city; 19 of these (30% of the total) were known to come from the small group of 369 at special risk following contact with pulmonary tuberculosis. Examination of the records of the 19 children who died showed that nine had been tuberculin-negative at the first examination, and eight of these were under two years of age.

Discussion

The work here described was undertaken as an exercise in preventive paediatrics in an industrial community of 270,000 inhabitants in which infantile and child mortality has always been high. The problem was to find methods of reducing the deaths from tuberculosis in children of a particular age group, the majority of which were undoubtedly caused by the presence in the community or the household of adults with open pulmonary tuberculosis. Ultimately the child's only effective protection is by the separation of the infector from the community for as long as may be necessary to render him non-infective. This implies the maintenance of his family while he is away and the provision of suitable employment after his return. But this aim seems so far from realization in most areas that it is appropriate to consider if anything can be done to reduce the morbidity and mortality in the group at special risk—the children in home contact with pulmonary tuberculosis.

A large literature dealing with the effects of home contact on young children already exists; all the essential data concerning the risks are known. Where the logical conclusions of this knowledge have been applied, as in Sweden, the results obtained have proved beyond all doubt that the deaths of small children from tuberculosis can largely be prevented. It is difficult to know why these conclusions have not been applied in England or why the Swedish work has not received more attention, but the fact remains that little has been done by the public health services to provide care and treatment for this particular age group.

It has been shown repeatedly—in England by Cox (1929), in America by Brailey (1940), and by many other authors, quoted by Kayne (1935)—that children in households containing an adult suffering from pulmonary tuberculosis are subject to a much higher mortality from tuberculosis than that experienced by other children of their age group. Furthermore, all observers have agreed that the primary infection is most dangerous if acquired in the first year, that there is a considerable risk in the second year, and thereafter the risk falls to the age of 5 years. The least dangerous period to acquire the primary infection appears to be between 5 and 15 years. Many figures have been compiled to show this, but it is sufficient here to quote only those of Braeuning and Neumann (1929), Table V. If, therefore, it is true that all individuals sooner or later acquire a tuberculous infection, it is equally true that they should not be allowed to do so in the first five years of life.

The problem of the young child in a tuberculous household is to devise methods of separating him from continued contact if he is free from infection when first examined or to consider what can be done to separate him from further infection if he has an active primary focus; it seems quite illogical to be compelled to wait until the child does become infected before arrangements for his care are possible. Sometimes separation can be accomplished by allowing the child to go to a relative; but the number of cases in which this is possible is not large, and this method of separation is often incomplete. Two other methods are available: admission to a home for infants or to another family group, the parents of which would act as foster parents

TABLE V.—*Mortality at Various ages: Exposure to Open Pulmonary Tuberculosis (Braeuning and Neumann, 1929)*

Age when Contact Began (Positive-Sputum Contact)	No. of Cases	Tuberculosis Mortality	
		Within One Year	At end of Five Years
0–1 year	246	6·1%	8·1%
1–5 years	569	1·4%	1·4%
5–10 „	618	0·49%	1·4%
11–15 „	647	Nil	1·0%

until the danger of infection has disappeared. In Sweden both methods have been used, and out of his great experience Wallgren (1939) advises the infants' home rather than the foster parent. He considers the dangers of infection in a well-managed nursery are not greater than in a private house, and he finds parents are more willing to allow their children to enter institutions than to join other families. Another advantage of the institution is that if B.C.G. vaccine is used to produce an artificial temporary immunity the children can stay there for the requisite period of three months while the vaccine is given and hypersensitivity is developed.

In Newcastle-upon-Tyne during the period under consideration 227 children in contact with pulmonary tuberculosis were negative when first examined; even if the admissions to a home for infants had been restricted to those known to be in contact with open pulmonary tuberculosis it would have been necessary to offer approximately 103 places in 4½ years. To estimate the average length of stay is difficult, but the need could probably have been met by the provision of an infants' institution of 40 beds, the cost of which, apart from establishment and capital charges, would be approximately £4,000 a year. The foster parent scheme should, theoretically at least, be more satisfactory than the institution. It would cost approximately £3,000 a year, but it would be difficult to obtain enough suitable foster parents.

In Sweden B.C.G. vaccine has been widely used for the past 20 years and the Swedish workers consider that children who become tuberculin-positive after the administration of the vaccine acquire an immunity which enables them to resist infection under natural conditions for about two years. Recently the National Association for the Prevention of Tuberculosis and the Joint Tuberculosis Council have presented a memorandum to the Ministry of Health (Tytler, 1946), in which they urge trials of B.C.G. vaccine in England.

Our indications for the hospital treatment of infected children have already been given. The essential object of

special treatment is to give the child with a primary infection the best opportunity of resisting and then healing the lesion. In 4½ years 57 children were admitted to hospital from the contact group for clinical and social conditions. If more beds had been available at least 80 children would have been admitted, and I estimate that in Newcastle-upon-Tyne at the present time a tuberculosis contact clinic of this type requires the use of 10 hospital beds for children under the age of 3 years. This number does not include accommodation for children with acute disseminated tuberculosis and children over 3 years of age who can be sent to a children's sanatorium.

These estimates give some indication of the provision which I consider would be required to meet the problem of primary tuberculosis in young children of tuberculous families in Newcastle-upon-Tyne. The assumption I have made is that the present difficulty of removing the adult infector will not be changed materially in the immediate future; as, however, more beds become available in sanatoria and the economic provision for families is extended the need for special protection for children will be reduced proportionately. Until then the work of diagnostic clinics will, I believe, be a valuable part of the tuberculosis service if the case-finding mechanism is supported by the provision of hospital beds and methods of separating children from danger of infection. If there is no such backing then one can agree with Thompson (1944) that the examination of children as contacts is not of much value apart from clinical and epidemiological interest.

Summary

The organization and work of a clinic for the examination of tuberculosis contacts has been described.

From June, 1941, to December, 1945, 520 children under the age of 5 years were examined: 369 contacts of pulmonary and 151 of other types of tuberculosis.

At the first examination 142 of 369 contacts of pulmonary tuberculosis were tuberculin-positive; of 151 contacts of other types of tuberculosis 12 were positive.

The mortality from tuberculosis in the 369 children in contact with pulmonary tuberculosis has been 5% to December, 1945.

In children under the age of 5 years 30% of the morbidity and 30% of the total mortality from tuberculosis occurred in a small group at special risk.

An attempt has been made to estimate the provision required to meet the needs of this group: (*a*) to separate the uninfected from further exposure; (*b*) to change the environment of the infected when this is necessary for either social or medical reasons.

I wish to thank Prof. J. C. Spence for criticism, Dr. G. Hurrell and Dr. E. G. Brewis of the City Tuberculosis Service for their co-operation, Dr. S. M. Livingston for continuing the work during the most difficult period of the war, and the health visitors, Misses F. M. Hatfield and E. Hann, for their constant enthusiasm and patience.

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Memoir of David Little, M.D., by his daughter, Dora Little (from whom copies may be obtained at 16, Fairacres, Roehampton Lane, London, S.W.15), is a personal note on the famous ophthalmologist, and includes a facsimile of a letter from Florence Nightingale as well as a number of portraits and illustrations.

RHABDOMYOSARCOMA CAUSING ACUTE RETENTION IN INFANTS

BY

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Rhabdomyosarcoma is rare, but two cases in which this growth caused acute retention in infants were admitted to the Royal Victoria and West Hants Hospital, Bournemouth, during 1944–5.

Nine cases of rhabdomyosarcoma of the urinary bladder have previously been reported, Case I below being the tenth. Seven of these occurred in infants aged from 3 days to 2 years. The remaining three were in adults of 23, 43, and 69 years. Rhabdomyosarcoma of the prostate or prostatic region has been reported in 19 cases, and Case II below is the twentieth. Although the origin of this growth is usually assumed to be in the prostate, Hirsch and Gasser (1944) suspect that it may belong to the class of similar growths which occur along the vas deferens.

The literature on both types of growth has been excellently reviewed by Khoury and Speer (1944), who also discuss the pathogenesis, pathology, and histology of these tumours.

Case I

A 17-months-old male child was admitted to hospital on July 15, 1944, with a history of difficulty in micturition for more than four months. Apart from an inguinal hernia, which had been "cured" 12 months before by wearing a truss, he had not suffered from any ailments since birth until the onset of the urinary trouble. During the four months before coming to hospital his dysuria had been treated by circumcision and urinary sedatives, without relief.

On examination the bladder fundus was level with the umbilicus, forming a tense globular swelling. Rectally the bladder was found to be partly filling the pelvis. A straight skiagram revealed no opaque calculi in the urinary system. The blood urea was 51 mg. per 100 ml. Slow decompression of the bladder was instituted, but it was soon found that despite the height of the fundus 2 oz. (56 ml.) of urine could not be obtained at hourly intervals. A cystogram showed a mottled picture suggesting a large cauliflower mass arising infero-posteriorly in the bladder.

At operation on July 24 the bladder, which was the size of a cricket ball and had hypertrophied walls, was found to be filled with numerous rounded myxoma-like pieces of tissue varying in size from a pea to 3.5 by 2.5 by 2 cm. Some pieces appeared to be detached and floating free, others were attached by filamentous pedicles, but the most recent growth arose from a broad pedicle about the size of a postage stamp, situated antero-laterally to the internal urethral meatus. Some 8 oz. (225 g.) of growth was removed and the pedicle was diathermized.

Histological examination showed that the pieces of tumour consisted of connective tissue interspersed with spindle and cylindrical cells which in many places were distinctly eosinophilic and had faint cross-striations. Some of the spindle-celled areas showed a moderate number of mitotic figures. A layer of partly denuded stratified epithelium clothed the surfaces of the growth.

After operation the patient's convalescence was slow and the suprapubic wound did not heal completely. A month later he complained of pain on defaecation and micturition, and at the end of two months a polyp of growth was extruded from the suprapubic wound. On Nov. 6 the bladder was reopened and a further 8 oz. (225 g.) of growth removed. This was of the same myxomatous, avascular appearance. The pedicle had not enlarged since the previous operation and the ureters and urethra were free from invasion. The pedicle was again