millimetre deep on the surface of the heart at the site of application of these electrodes. It is advised that before using electrical stimulation the heart should be massaged vigorously until it is fairly well emptied and the colour and pulse have been restored. After a minute or two of this, the electrode may be applied and the shock given, following which if the beat has not been restored further massage should be continued. This can be repeated several times, although it is not without its dangers.

SUMMARY

There is no question that many cases of cardiac standstill are the result of carelessness, and the best treatment is adequate care which will ward off and prevent this dire tragedy. If standstill has occurred or is discovered, the measures for applying resuscitation have been discussed.

REFERENCES

1. STARLING AND LANE: *Lancet*, **2**: 1397, 1902.
2. KOUNTZ, W. B.: *Ann. Int. Med.*, **10**: 330, 1936.
3. WIGGERS, C. J.: *Am. J. Physiol.*, **92**: 223, 1930.
4. WEINBERGER, L. M., GIBBON, M. H. AND GIBBON, J. H.: *Arch. Neurol. & Psychiat., Chic.*, **43**: 615, 1940.
5. CALLAGHAN, J. C. AND BIGELOW, W. G.: *Ann. Surg.*, 134: July, 1951.

OUTBREAK OF TUBERCULOSIS IN A COMMUNITY

G. E. MADDISON, M.D., C.M., D.P.H., *Saint John, N.B.*
C. C. BAIRD, M.D., C.M., *Chipman, N.B.*

AN OUTBREAK of acute tuberculous infection has occurred in and about a small village in New Brunswick during the past 12 months. The village and adjacent parish has a population of about 1,550 people. Medically, the area is served by one physician who resides in the village. There are no hospital or x-ray facilities, the nearest being sixteen miles away.

The village is the centre of a long established lumbering and farming community of average economic standard. There are no apparent factors in the area which would seemingly facilitate the spread of an infection in epidemic form; *i.e.*, there are no industrial or obvious unsanitary factors involved. The schools, where cases developed, are modern; one building houses grades 1 to 6 and the Regional High School, in another part of the village, is a most modern building, constructed only within the past year.

The first evidence of an outbreak of infection was the occurrence of twelve cases of erythema nodosum during the last three calendar months of 1951. Fifteen cases of pleurisy with effusion occurred in a six-month period of late 1951 and early 1952. There have been cases of active pulmonary tuberculosis, in addition,—varying from minimal to far advanced during the past year—all but two within the past eight months.

The erythema nodosum was the first indication of the outbreak.

A review of some of the recent literature suggests that erythema nodosum is not regarded as a specific disease. Middlemiss[1] states: "It is generally agreed that erythema nodosum is not a specific disease but is a non-specific reaction to various infectious and toxic agents." "It occurs most commonly in association with primary tuberculous infection. It is believed that in England the possibility of primary tuberculosis must be considered in all cases of erythema nodosum until some other etiologic factor is demonstrated or proved." However, an editor's note on this article states there is a marked discrepancy between findings in Britain and America regarding the relation of erythema nodosum to tuberculosis. He states that in America tuberculous infection seems rarely to be the cause.

In this outbreak, it would seem that we are dealing with tuberculous infection as the cause of the erythema nodosum. There has not been an outbreak of erythema nodosum in this area in the past twelve years. There have been three cases in the last ten years, all in adult women.

The twelve cases of erythema nodosum developed in a period of three months; eight of them or 66% were in school children—five of them from one of the grade nine school classes; five were girls ages 14 and 15 while the other three were boys ages 13, 14 and 15 years. The remaining four cases were females—two housewives in their 40's and two clerks in their 20's. Of these twelve cases, 75% were females.

The general symptoms of these cases of erythema nodosum were similar in the early stages to that of the common cold—slight fever, nasal discharge and slight cough. The rash did not

Canad. M. A. J.
Mar. 1953, vol. 68

appear until after the onset of fever, and in most cases the temperature became further elevated when the rash appeared, rising to 103° in some cases. Drugs such as penicillin and aureomycin had no apparent effect on the fever. The rash varied from a few spots on each leg, tibial surface, to numerous spots; in three cases the rash was on the arms as well as the legs, from elbow to wrist. The erythematous macular to papular rash was somewhat elevated with some induration and there was marked tenderness over the areas of the rash; the colour varied from crimson to purplish and black and blue. The duration of the rash varied from a few days to three or four weeks. Though the tuberculin status of these twelve cases was not known prior to their illness, all but two are now patch test positive. (The two cases, adult females ages 45 and 42, have not yet been skin tested.)

During subsequent months, four of these cases of erythema nodosum have developed x-ray evidence of pulmonary infiltration—three in 15-year-old school girls, one a 20-year-old clerk; two of them have entered sanatoria for treatment. There has so far been no apparent relation between the severity of the rash and the eventual development of a tuberculous lesion.

Geographically, the majority of the cases of erythema nodosum lived in a part of the village where an open active case of pulmonary tuberculosis had been found about June, 1951. Five of the twelve cases were students in one high-school class room where later a former student was found to be an open case of pulmonary tuberculosis.

Pleurisy with effusion.—Seventeen cases of pleurisy with effusion have developed in the village since September 1951. All of the cases have been diagnosed by history, physical findings, x-ray, and twelve of them by sanatorium examination of the fluid. Half of the cases of pleurisy were in school children—equal numbers of girls and boys. The adults were divided as to sex.

Investigation.—The cases of erythema nodosum appeared from late October 1951 onward. As soon as the number of cases was realized together with two early cases of pleurisy with effusion, the Division of Tuberculosis control of the Province was asked to assist in locating the sources of infection. The actual investigative work could not start because of the proximity of holidays until the second week of January 1952. The first step was to tuberculin test all the children in the school classes, grades 1 to 9 inclusive, some 483 children. (Patch testing was the most expedient method that could be used.)

Of the 483 children tested, 111 were found to be positive—about 23%. This immediately seemed to be a much higher rate than would be expected to be found in a semi-rural school population. The results tabulated by age-group or class showed an increasing number of the positives in the older ages or higher grades. The number of positives increased sharply in the high school classes which was in a new high school building, comprising grades 7 to 12 inclusive. There were two grade 9 classes: class 9A had nine children (ages 14 and 15) positive out of a class of twenty-one, or 43%; while class 9B in which there were 18 students (ages 14 and 15), 100% were patch positive.

One week after the patch testing, mobile x-ray equipment was sent to the village and in 2½ days of operation, examined by means of 70 mm. film, 1,611 people. In view of the fact that the population of the village and parish is only about 1,500, the number attending the survey indicates the extent to which the community was aroused.

The listing below provides the results of the interpretation of these survey films:

TABLE I.

Number of films taken		1,611
Pulmonary tuberculosis, questionably active		5
(a) Minimal	2	
(b) Moderately advanced	1	
(c) Far advanced	2	
Pulmonary tuberculosis, inactive		1
(a) Minimal	1	
Pleural effusion		3
Previous pleurisy, old		6
Suspicious		7
Non-tuberculous abnormalities		8
Films non-interpretable		50

Of the five cases considered questionably active, four were found on further investigation to be in need of treatment and were at once admitted to sanatoria. The fifth case is still under observation. Two of the four were bacillary.

The three pleural effusion cases were subsequently admitted to treatment.

The seven suspicious cases were clinically examined and two (boys ages 13 and 10) were found to have early infiltrative disease, diagnosed tuberculous.

Therefore of the group examined, nine persons were found to have disease requiring immediate treatment.

The feature of this survey was the finding that one of the cases of far advanced pulmonary disease was a fifteen-year-old boy who had attended school Grade 9B (where all pupils were patch positive) all of the autumn term; though his disease was bilateral with several large cavities and positive sputum, he left school at the end of the first term and went to work as a labourer. This boy was considered to be the likely source of infection for the school children.

The other case of far advanced disease which had positive sputum was found in an older woman who lived outside this town in an adjacent area.

As soon as possible after this examination, a clinical examination of the suspects and some not previously examined was made. An additional 100 people who had not attended the previous survey came for small films. At this time, one former patient who lived outside the village was found to have re-converted to positive sputum and was re-admitted to sanatorium. Two boys who had a suspicious lesion at an earlier examination were considered in need of institutional treatment and referred.

Three months later (June 5 to 7, 1952) another visit of the survey unit was made to the village together with the clinical examination of former and new suspects. At this survey, some 1,533 people attended. The results of this survey are as below:

TABLE II.

Total number of films taken		1,533
Pulmonary tuberculosis, questionably active		4
(a) Minimal	2	
(b) Moderatly advanced	2	
Pleural effusion		1
Previous pleurisy		4
Suspicious		9
Other abnormalities		5

Three of the cases of active pulmonary tuberculosis are children who have developed since January; *i.e.*, chest films then were negative. The fourth case was an adult female who did not reside in the village. All four have been admitted to sanatoria for treatment.

The case of pleurisy with effusion was a boy, age 14, who had x-ray evidence of a basal effusion, and who was negative upon x-ray examination at the time of the earlier survey, six months previously.

Of the nine cases regarded as suspicious, there have been none who have been found to have evidence of active tuberculous disease. Three were found to have some acute non-tuberculous disease, and the other six will be followed at intervals.

The findings of this area, up to the present time, show that twenty-nine people—ages 2¼ years to 62, have been admitted to sanatoria from this one area (population 1,500) since May, 1951. All but three have been admitted during the past six months and six are bacillary by sputum examination.

SOURCE OF THE INFECTION

A review of the known cases of tuberculosis which have been admitted to sanatoria from this village during the past ten years, shows that there have only been about one or two admissions per year. The incidence from this area has not been excessive during any of the previous ten years.

An important feature of this outbreak is the history of the finding of a case of far advanced pulmonary tuberculosis in a man, age 28, who was diagnosed in May, 1951 and admitted to a sanatorium then. This man had been unwell for some months prior to the definite diagnosis, and spent much of his time sitting about a country store.

In September 1951, the 27-month-old infant daughter of the store-keeper whom this man had often held on his knee at the store was found to have advanced pulmonary tuberculosis and a positive sputum. This child was admitted to treatment at once.

TABLE III.

OF THE TWENTY-NINE IN SANATORIA
5 have been diagnosed minimal, active
5 have been diagnosed moderately advanced, active
4 have been diagnosed far advanced, active
4 have been diagnosed childhood or primary active disease
9 have been diagnosed pleurisy with effusion
2 have been classed suspicious—(not yet proved to be tuberculous disease.)

Another case of tuberculous infection which seemingly came from this source was located in another village some seventy miles away. This child, a girl age 12, was diagnosed in November as active primary tuberculous disease. This girl spent some two weeks in this village during August 1951 and had spent all of her time at a home near this store. Her own family were later examined and found to have no evidence of dis-

ease. Presumably her infection came from this source.

The fifteen-year-old boy, who attended high-school during the most of the autumn term and who was found on the first survey, was a case of far advanced disease with positive sputum. He had lived near and spent a great deal of time at the store where the man found in May 1951 used to sit (and likely spit).

It was about 6 to 8 weeks after the start of the school term that the cases of erythema nodosum occurred in the school group.

SUMMARY

Tuberculosis, endemic to the area, has seemingly spread in epidemic form in this community.

Forty-five people of the area have been diagnosed as having some evidence of infection and are presently under observation or treatment. Twenty-nine of these—varying in age from 2¼ years to 65—have been admitted to sanatoria with a diagnosis of tuberculous disease; twenty-seven of them within the past six months. There are five of these people who have positive sputum.

Twelve cases of erythema nodosum occurred within a two-month period—five of whom were in the same school grade.

Sixteen cases of pleurisy with effusion occurred in the village within a six-month period, eight of them school children.

Out of the 483 school children, ages 6 to 14 or grades 1 to 9 inclusive, 23% (or 111) were patch positive. In one class—ages 14 and 15—100% were found to be positive.

One of the important aspects of this outbreak is the age-group which is involved. Of the forty-five people presently under observation or treatment, 66% (30) are under the age of 21, and over 80% of these are under sixteen years. In view of the age-group involved, there will probably be new cases or breakdowns in the future.

The chain of infection is probably established. An unknown case in the village, positive for tubercle bacilli, apparently infected several people at a common meeting place; one of whom, a school boy, became a new source to spread the disease in a class-room and likely to others by common modes of spread.

The usual case-finding methods were used, as soon as the outbreak was known. The use of the mass chest x-ray screening service in the community proved to be valuable. There were at least three possible infectors in the village after the outbreak was noted; an examination of the schools only would not have detected the boy who had left class and who had likely been a chief infector.

REFERENCE

1. MIDDLEMISS, J. H.: *Brit. J. Radiol.*, **22**: 375, 1949.

LEUKÆMIA AND PREGNANCY*

LOUIS J. HARRIS, M.D., M.A., F.R.C.S.[C.],
Toronto

THE PURPOSE of this paper is: (1) To add five authentic cases of this rare complication of pregnancy to those already reported in the literature. (2) To present the first case of leukæmia in pregnancy treated with ACTH, cortisone and aminopterin. (3) to review briefly the salient features of leukæmia as it affects and is affected by pregnancy.

CASE 1

Mrs. E.W., age 27, admitted to Toronto Western Hospital, August 14, 1943. This nulliparous white female had her last normal menstrual period on May 15, 1943. She was well until two weeks before admission to hospital when she began to notice increasing weakness and fatigue. She also complained of a sore throat, sore mouth, bleeding gums, anorexia, vomiting, headaches and lower abdominal pain.

Examination revealed a pale, young woman with swelling, ulceration and hæmorrhages from the gums and mucous membrane of the mouth. The tonsils were enlarged and inflamed. The lymph glands, liver and spleen were not palpably enlarged. There were bruises on the right arm. The uterus was enlarged to the size of a three months' pregnancy.

The Hb. was 26%. R.B.C., 1,930,000. W.B.C., 23,500. 95% myeloblasts and myelocytes. Platelets 120,000.

Course.—She was given only symptomatic treatment and after 48 hours developed a transitory left sided paralysis. Two days later she developed right sided paralysis, became increasingly stuporous and died on August 18th, four days after admission. At that time her W.B.C. had risen to 46,800 with 95% myeloblasts.

An autopsy revealed: (a) Pregnancy about 11½ weeks, 57 mm. (b) Splenomegaly—430 gm. (c) Hepatomegaly—2,570 gm. (d) Hyperplasia of the bone marrow, filled with myeloblasts. (e) Hæmohydroperitoneum. (f) Ulcerative gingivitis. (g) Hæmorrhages into the grey matter of the brain.

This is a case of acute myelogenous leukæmia superimposed on pregnancy, with a rapid fatal outcome—*i.e.*, three weeks.

*Read before the Society of Obstetrics and Gynæcologists, Banff, June, 1952.