

# PRACTICAL ADMINISTRATIVE POLICIES FOR SUPERVISION OF CHILDHOOD-TYPE TUBERCULOSIS

BASED UPON EXPERIENCE IN CATTARAUGUS COUNTY

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**T**HE experience of the Cattaraugus County Bureau of Tuberculosis, since its organization eleven years ago, has led to a slight variation from the program commonly proposed for the supervision and institutional care of children showing childhood-type tuberculosis.

The tuberculosis infection incidence among children, as judged by the intradermal test with 1.0 mg. or less of standardized Old Tuberculin, has been found to be very low. Fifty-seven children of preschool age, tested in a series of health examinations of an unselected sample of the village and rural population all failed to respond to 1.0 mg. of Old Tuberculin; 640 children from ages 5 to 19 inclusive, from the same group, showed 9.8 per cent positive reactions. Of 1,103 apparently healthy school children aged 5 to 19 inclusive, from eighty-five rural and village schools 10 per cent showed positive reactions. Even in the clinics conducted by the Bureau throughout the County, in which about 75 per cent of the children were urban and in which 10 per cent had had domiciliary exposure to positive sputum, the infection incidence in those under 20 years of age has averaged only 16 per cent for the past six years. Among those not known to have been exposed to a positive sputum within the household this incidence has decreased gradually among those under 16 years from 19 per cent in 1928 to 3 per cent in 1933. The average for 2,094 clinic children under age 20 without known household exposure to positive sputum

<sup>1</sup>From the Cattaraugus County Department of Health and the Division of Public Health Activities of the Milbank Memorial Fund.

tested in the six years was 12 per cent. The average for the 207 tested who were known to have been exposed to positive sputum within the household was for the six years 66 per cent or five and one-half times the incidence of the unexposed group. It is probable that the population of the County under age 19 is infected to the extent of not more than 12 or 13 per cent.

It is our experience that casual infection during childhood has not resulted in the production of massive lesions, as judged by the X-ray film, nor has it been associated with the development of the adult type of tuberculosis. Of 493 reactors under age 16 seen in clinics and school surveys in the last six years, 170 had had household exposure to positive sputum. These 170 showed in fifty-eight instances (or 34 per cent) tuberculosis of the childhood type or some form other than

Table 1. Children and adolescents observed from 2 to 10 years classified according to reaction to tuberculin and X-ray evidence of disease, Cattaraugus County.<sup>1</sup>

CLASSIFICATION ACCORDING TO SEX AND EXPOSURE TO TUBERCULOSIS	TOTAL CHILDREN OBSERVED	NON-REACTORS <sup>2</sup>	REACTORS, X-RAY NEGATIVE	REACTORS, X-RAY EVIDENCE OF PRIMARY INFECTION
Total number observed	500	200	200	100
Boys	238	97	96	45
Girls	262	103	104	55
Number of person-years observed	1,742	668	644	430
Household exposure to positive sputum or other excreta:				
Known	93	12	42	39
Suspected	54	4	26	24

<sup>1</sup>A total of 1,427 X-rays were taken and may be classified as follows: non-reactors, 142; reactors, X-ray negative, 749; reactors, evidence of primary infection, 536. The X-rays include numerous oblique films and stereos in addition to flat postero-anterior films.

<sup>2</sup>156 of the non-reactors received 1.0 mgms. O. T., the remaining received 0.1 mgm. A total of 559 tests were made.

adult type. And while some of the remaining reactors, not known to have had household exposure to a positive sputum, also showed some lesions by X-ray, these children were proportionately less numerous and the lesions were much less extensive in the individual reactors. Moreover, none of the reactors acquiring infection casually has since shown evidence of the adult type of lesions.

A group of 500 children who have been kept under observation for varying periods was studied. These are divided into two main groups, 200 non-reactors and 300 reactors, as shown in Table I. The 300 reactors are further subdivided into those showing no X-ray pathology and those with childhood-type tuberculosis. Nearly all of the 300 reactors are still in the County and the plan is to continue supervising them into early adult life.

These 500 children were first observed in clinic or in school surveys, those in tuberculous households having been asked to come in because of their exposure. Many of the non-reactors came from households where a non-contagious case of tuberculosis had been diagnosed or they were applicants for health camp. The sexes are quite evenly represented, and the children are distributed by residence throughout the County with no preponderant numbers from the rural sections (123 of the 200 non-reactors and 168 of the 300 reactors live in the rural part of the County). While a consistent effort has been made by the Bureau to stop their contact with open cases of tuberculosis, these children, for the most part, have continued to live at home.

These 500 have been observed for 1,742 person-years. About 50 per cent of the reactors have been followed into adolescence. None of the 200 non-reactors has developed a positive reaction although five reactors have later become negative after retesting with equal or larger doses of tuber-

culin. One of the 200 reactors showing originally no X-ray pathology developed at age 14 a minimal adult type of lesion but only after sleeping with her mother for two months while the latter had a positive sputum. Two of the 100 reactors, originally showing by X-ray childhood-type tuberculosis, have developed the adult type, one at age 15 and one at 16. One of these had remained in the home with his father who has had a positive sputum for some years. The second had had heavy childhood exposure in the home seven years ago but none known since that time. This girl, however, had led a very strenuous life in school, playing on four high-school athletic teams. She had had almost a year's care in the county sanatorium in 1926-1927. The remaining ninety-eight reactors who originally showed lesions in various stages have since shown retrogression of these lesions without the development of new ones that were discoverable.<sup>2</sup> To date, therefore, we have seen three out of 300 reactors develop adult tuberculosis, two of them after continued or renewed exposure to a positive sputum within the home.<sup>3</sup>

There are other adolescents in the County who, after familial exposure in childhood, have developed adult tuberculosis, although it is unusual that the primary lesion can be identified by X-ray. In a majority of instances, however,

<sup>2</sup>The age distribution of the 300 positive reactors at the beginning of the period of observation was as follows:

AGE GROUPS	PER CENT	
	Reactors, X-ray Negative	Reactors, X-ray Evidence of Primary Infection
0-4	6.1	10.7
5-9	23.2	33.0
10-14	43.4	33.0
15-19	27.3	23.3

<sup>3</sup>The third developed her adult tuberculosis in spite of a year's care in the sanatorium at the time when her childhood-type lesion was discovered.

it seems that tuberculosis of adolescence, especially late adolescence, appears in individuals who give no history of exposure within the family. Occasionally a source of exposure in high-school is found. Sometimes the individual returns ill from college or work in a city outside the County and usually attempts to trace the infection to an individual have been unsuccessful.

A search was made for the source of infection in the new cases appearing between ages 15 and 21 inclusive during the last six years. These cases numbered thirty-four. In twelve, or 35 per cent, the source definitely was within the family or household, in twenty-two, or 65 per cent, it was apparently not within the family or household. This statement is being made after examining by X-ray all the household members of twenty of the above thirty-four cases, and some of the members of the other households, and after a careful recording of histories which has included questioning other members of the family as well as the family physician. The possibility of exposure to former members of the households has been kept in mind. Other observations on adults tend to confirm the belief that a large proportion, about half in fact, of the cases develop in individuals who have had no known exposure within the home to tuberculosis.

Granted there is a heavy childhood infection, with X-ray evidence, what is the obligation of the official anti-tuberculosis agency to these children? Most observers agree as to the essential mildness of the primary infection, no matter what potential danger it may hold. It is extremely difficult if not impossible to secure evidence that institutional care of primary lesions will prevent the later development of adult tuberculosis. Apparently the primary lesions fibrose or calcify as well outside sanatoria or preventoria as within them. In Cattaraugus County we have no preventorium so

we have been obliged to house children and adults under the same roof in the sanatorium. Under the conditions as they exist in the sanatorium it has been practically impossible for us to prevent some reinfection of the children.

In outlining a program covering practical administrative policies for the supervision of children who have childhood-type tuberculosis it must be emphasized that this is done primarily for Cattaraugus County where infection, morbidity, and mortality rates in tuberculosis are low and are decreasing. And since the word "practical" is included in the title of this paper it is only natural that one should seek a minimum-cost plan that will safeguard the children and the community.

Our aim and methods might be stated tentatively as follows:

1. Prevent childhood infection if possible by the use of safe milk and by the prompt removal of active pulmonary cases from the home. This presupposes alert, cooperative physicians and an adequate clinic and consultation service. Presumably it is better for young people in this County to grow up with their tissues unsensitized to the tubercle bacillus. They may become infected later but by the time they are adults they should be able through their own knowledge and volition to protect themselves from prolonged and massive infection in a way they could not as infants or small children.

2. Institutionalize all sputum-positive patients as soon as possible and until they are sputum-negative. At least they should not return to their homes with a positive sputum if there are children there.

3. Allow juvenile reactors, both those with and without X-ray evidence of primary lesions to remain at home if the health environment is reasonably satisfactory, provided of

course that bed rest or close medical supervision is not needed. A sanatorium, where contact with open cases is likely to occur, would not seem to be a suitable place for highly sensitized, apparently healthy children. A child with a positive sputum or with an adult type of lesion is a proper patient for the sanatorium.

4. The medical supervision of reactors among children perhaps may well be somewhat less intense than it has been in the past. Heretofore we have attempted to X-ray such children every three, six, or twelve months, depending upon the state of the lesions, partly with the hope of learning something about their evolution. Now because we have seen so few adult lesions develop in these reactors and for other reasons of a practical nature we plan to X-ray only once in three years up to age 15, always making allowance of course for the exceptional case, especially the child who continues to live at home where there is an open case of tuberculosis. After age 15 we hope to X-ray annually up to age 22. With a properly functioning generalized nursing service it is assumed that nurses will keep in touch with the reactors and with health conditions in their homes.

5. In view of the fact that a considerable number of adolescents who have had no contact with tuberculosis in the home develop the disease, not infrequently in an insidious yet very serious form, it is important that all high school students have their chests X-rayed at least once before they leave school. If advantage of this opportunity for an X-ray examination be not taken, on a voluntary basis, the boards of education should be encouraged to require it as supplementary to the school physician's examination.