REVIEW OF REVIEWS

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CONTROLLED DIAPHRAGMATIC BREATHING IN TUBERCULOSIS

Dr. S. Adolphus Knopf, of New York, has devised a method of breathing designed to give the tuberculous lung localized rest. He states that this method is only an "adjuvant" in the rest cure of pulmonary tuberculosis, designed to give the upper part of the lungs as much rest as possible, while the patient carries out the bed rest and fresh-air treatment which is generally considered essential in overcoming the disease.

Dr. Knopf's method of breathing attempts to limit the respiratory movements to the diaphragm, so that the bases will move more and the upper part of the lungs will move less, and the spread of toxins from the tuberculous foci (which are almost always located above the level of the hilum) will be thereby diminished.

Advance cases of the disease, involvement of the lower lobes, pleuritic adhesions to the diaphragm, and intestinal or peritoneal involvements which cause pain with diaphragmatic breathing are contraindications to the use of the method.

The *modus operandi* of controlled diaphragmatic breathing is thus described by Knopf:*

"The best position for the patient to assume when being taught the practice of controlled diaphragmatic breathing is to lie in or on the bed or on the reclining chair in a semi-reclining position, with feet extended and slightly separated, which position demands the least cardiac efforts against gravity. This position can be best obtained in bed by the use of three or four pillows, and later on may be imitated as closely as possible on the typical sanatorium reclining chair, by regulating the back of the chair so as to be at an angle of 30 degrees. In this position relaxation is most easily obtained and the heart is called upon to do the least work. It goes without saying that if the patient is dressed, there must not be any garments that would restrict the free exercises of the diaphragm and abdominal muscles.

"Before beginning the rest breathing it is presumed that, as the result of the explanation and instructions given him beforehand, the patient will be relaxed in mind and body. This relaxation of the body is essential and whatever muscular effort is exerted during the breathing exercises should be as slight as possible. He is then told to imagine that the respiratory movement begins in the

* "Controlled Diaphragmatic Breathing in the Treatment of Pulmonary Tuberculosis", by S. Adolphus Knopf, M. D., New York.

toes of the right foot, the inhalation gradually traveling upward as far as the diaphragm on the right side, then crossing over to the left, and gradually descending during exhalation downward to the left foot. While, of course, this breathing upward from the toes to the abdomen is merely imaginary, it results in a diaphragmatic breathing and whatever quantity of air is inhaled passes mainly through the lower portions of the lungs while the upper portions, where tuberculous lesions are usually located, are put, if not at complete, at least at comparative rest.

"The patient must of course concentrate his mind on this procedure. He cannot and should not be thinking of anything else during this rest-breathing period. The surest way to teach the procedure correctly is to ask him, during inhalation and during exhalation as well, to follow the physician's hand with index finger pointing as it moves in the upward direction from the right toe and over to the left side of the diaphragm, then downward to the left foot. When the physician's finger has arrived at the left side of the diaphragm, it will pause while the patient may hold his breath a second or two, and then exhale during the downward movement of the finger. The relation of the duration of the two acts should be 5 for inhalation and 4 for exhalation. With some patients ten seconds may be spent for the cycle, 5 for inhalation, 4 for exhalation, and 1 for stoppage between inhalation and exhalation. With other patients, particularly the more advanced cases, it may be necessary to count rapidly and shorten the cycle. Nearly all cases are able to lessen the number of respirations per minute with absolute comfort by stopping after the exhalation two, three or more seconds before inhaling again. In fact, one may leave the duration of the interval between each cycle of the respiratory movements to the ability of the patient to remain quiet before inhaling again. If he is able to hold the air after inhalation several seconds longer, he may also do so."

Dr. Knopf's method of controlled diaphragmatic breathing seems a very logical procedure, and one that may be destined to a permanent place in the therapeutics of tuberculosis. It is without question one of the most important recent contributions to the treatment of phthisis, and its very simplicity and comparative innocuity make it worthy of a trial. Its effect upon the mental attitude of the patient is said to be one of its most desirable features, as it creates a desire on the part of the patient to cooperate with the physician and tends to prevent the mental inactivity which is so often the cause of worry and pessimism.

An intelligent, cooperative patient, is essential to the success of the method.

TEN CARDINAL POINTS IN HEALTH INFORMATION

The following "ten points", which are set as a standard for the health information that every intelligent adult should posses, are quoted in the August numer of *The Journal of the Outdoor Life,*

from an address given before the American Health Congress by Dr. Livingston Farrand, President of Cornell University:

"1. Every intelligent adult should have a knowledge of the physiological basis for sound health habits, such as regular and sufficient hours of sleep, right posture, suitable exercise and proper elimination.

"2. He should know the types and amounts and proportions of the various food elements essential to the proper nurture of his body.

"3. He should have an acquaintance with the principles of normal mental action and the conditions underlying the more common variations from the normal state of mind.

"4. He should have a general understanding of the sex instinct in man—its stages of development, its normal expression and the values and penalties attaching to it.

"5. He should have a knowledge of the factors determining infection and resistance and of the principles of artificial immunization in the case of certain of the common infectious diseases.

"6. He should have enough knowledge of the causes and prevention of the degenerative diseases to offer a prospect of passing through middle life without a breakdown.

"7. He should know and therefore be armed against health hazards lurking in the environment, such as polluted water and milk supply, congestion in housing, poisonous dusts of certain industries, infested soil, etc.

"8. He should appreciate the necessity for frequent medical and dental examinations.

"9. He should have an intelligent basis for choosing wisely his medical and dental advisers, and for realizing that the modern practice of medicine is grounded on science, and not on mystery, fancy and tradition.

"10. He should have a knowledge of the important health problems facing the community, of the methods of attacking those problems, and of the results to be expected from intelligent community action in the public health field."

CAMPAIGN AGAINST DIPHTHERIA IN NEW YORK STATE

The following notes on the campaign of diphtheria prevention in New York State are taken from the weekly *Bulletin of the Bureau of Public Health* of the State of New Mexico, corresponding to September 7th. They are of interest as showing what can be accomplished by the extensive use of toxin-antitoxin, in the immunization of young children against diphtheria. This same method is being used in Porto Rico by our Health Department, and there is no reason why it should not lead to the same brilliant results obtained in New York State, in the lowering of the diphtheria death rate.

"The lowest diphtheria death rate ever recorded in New York State was noted for the year 1925, according to an announcement by Dr. Matthias Nicoll,

State Commissioner of Health. The figure for 1925 was 9.0 deaths per 100,000 population. This may be contrasted with a rate of 45 in 1900. In twenty-five years the mortality from diphtheria has shrunk to one-fifth its former proportions.

"The rates since 1920 are:

1920	18.5
1921	16.2
1922	13.7
1923	9.5
1924	10.1
1925	9.0

"The weapon which the State Department of Health has found most effective in hastening the reduction of diphtheria is the immunization of young children with toxin-antitoxin. So well has this preventive treatment been received by the public, that the number of children protected the current year will probably equal *six times the number reached last year.*

"Reports from all available sources indicate that approximately 55,000 children in the state, exclusive of New York City, have been immunized during the first six months of 1926. At this rate the year's total would be 110,000, which may be compared with 19,500 immunizations during the entire year 1925.

"As the treatment appears to give life long immunity against the disease, the protection of the upstate's annual increment of 125,000 babies as they pass their first birthday would soon bring about the extermination of this disease. At present about 90 per cent of the deaths from diphtheria occur in children under 10 years of age.

"The campaign against diphtheria in New York State is being sponsored by the State Department of Health, State Department of Education, State Charities Aid Association, the State Medical Society and the Metropolitan Life Insurance Company. During the first half of 1926 the State Department sent out 323,435 thimble-full portions of toxin-antitoxin as compared with 115,335 in the same period of 1925. Over 200,000 pieces of literature on diphtheria were also given out."

RURAL WATER SUPPLIES

"The drinking of untreated, unsupervised, surface waters is nowhere absolutely safe, and while that from the ground or cistern is apt to be sanitary, all possible precautions must be taken to maintain its quality," says Jack J. Hinman, Associate Professor of Sanitation at the University of Iowa, in an article that appeared in a recent issue of *The Nation's Health.*

The degree of danger of surface waters he states, increases very rapidly as the population on the watershed becomes greater. The less inhabited the area from which the stream comes, the safer it is to use the water for drinking purposes. But untreated surface water should never be regarded as absolutely safe to drink, no matter where it comes from.

He warns against placing too much confidence on chloride of lime as used sometimes in the country for treating surface waters. Chloride of lime loses its strength very rapidly when the package is open, and if it has been on the shelves of the merchant for a long time, it is probable that it is much weaker than when it left the factory. The best way to purify water on the farm, he says, is to boil it for a few minutes and then cool it, taking care to see that the water it not recontaminated.

If untreated water is to be used, ground water or cistern water is the best, but great pains must be taken to exclude surface waters from wells, springs, and cisterns because "the entrance of surface water is evidence that the path is open for the entrance of the most dangerous matters," which will be picked up by surface drainage, if they are deposited in its path. "If a privy, or a barnyard, or a place where wastes are thrown, is located at a point higher than the well, the runoff may carry the sewage-like matters down into the well itself."

"Frequently," states Mr. Hinman, "the tops of wells or cisterns are inadecuately protected against the entrance of surface water, or a cistern is cracked in such a way that water con get into it close to the surface of the ground. The surface water running into the cistern through such openings will make the cistern water harder, but the amount of water may not be sufficient to make the increase in hardness perceptible to those using the water. Even though the amount of this surface water is small it may be of great importance from the standpoint of hygiene if it carries wastes from the body of some person who is excreting disease producing bacteria or other parasites."

"Dust collects on the roof of the house. Squirrels, birds, and cats may deposit their droppings there. If the householder take the trouble to manipulate the by-pass on the down-spout most of this sort of material will be washed off the roof as waste water with the first part of the rainfall of the showers. If the householder then collects in the cistern only the last part of the water fallen during the shower, he will collect much purer water. It is quite possible to collect satisfactory rain water, even in the city, but most people do not want to take the trouble to attend to the matter."

"It is this same sort of disinclination to attend to details until some serious thing has happened, that makes so many of the rural wells unsafe. Almost all of the trouble with these wells is in the upper

ten or twelve feet of the casing where it can easily be got at, or else it is due to the condition of the covering of the well."

Mr. Hinman here inserts a letter received in the Hygienic Laboratories of Iowa City, Iowa, from a farmer who was having trouble with his well water. The letter read thus:

"Please send a container to me at once so I can send you a sample of our well water for analysis. When pumping today a dead snake was pumped up and do not know if we dare use the water now without boiling it before using. Please tell me what to do to get a correct sample to you.

Yours truly,

——— ———."

"Of course", comments Mr. Hinman, "nobody likes to think of drinking water from a well in which a dead snake has been macerating for an indefinite period, but the chances are that the snake was not so dangerous to the people using the water as some other things that could have gotten into the well. Compared to bacteria that cause typhoid fever and other intestinal troubles, the snake was a tremendous animal requiring a very large opening for passage, even though from our standpoint it was only one of the smaller garter snakes.

"To the analyst in the laboratory it seems hardly necessary to send a container for the collection of a water sample to the man who wrote that letter. It is obvious to the analyst that if the snake could get in, so could surface water with its accompanying possibility of trouble."

Discussing the safety of water from deep wells, Mr. Hinman says:

"There seems to be a general opinion that a deep well is always safe. Opinions differ as to just what a deep well actually is, for almost any driven or drilled well, as well as many dug wells, seem so to be regarded. The geologist would say perhaps that a deep well was one that took its water from a water-bearing formation that was separated by an impervious layer from the water percolating downward from the surface. In the work of the public water laboratory it is often impossible to know much about the geological characteristics of the locality from which a particular sample comes, and the actual depth of the well is often in doubt. Under these conditions some loboratories have adopted an arbitrary value of a depth of 100 feet, and call all wells of less depth, shallow wells. Those over that depth are 'deep'. If the depth of the well is unknown, it is called 'shallow', since it is realized that that will be correct in most cases.

"Based on a classification such as this," he states "experience in Iowa has shown the character of private water supplies to be somewhat as follows:

Water from Private Sources, 1915–1924, inclusive

	Satisfactory per cent
Shallow wells	18.14
Deep wells	68.19
Springs	29.09"

Although the deeper wells evidently have an advantage in their safety over shallow wells and springs, Mr. Hinman deplores that it is rather common to find that "the top of the metallic casings of deep wells may be cut off close to the bottom of a pump pit and that the opening between the drop pipe, or working barrel of the pump, may not be closed," thus leaving an unprotected space through which any water which accumulates in the pit may run down.

"Sometimes", he adds "metallic casings are acted upon by the water of the supply in such a way that holes develop in them and thus polluted water is let in. Sometimes, also, wells may penetrate solution passages, or caverns, in the limestone, and these passages may communicate with sink holes which are receiving polluted surface waters. It is the writer's experience, however, that such situations are less frequent in their occurrence than the contamination through the open upper end of the casing.

"From the foregoing remarks," he concludes, "it will be evident that the thing most to be avoided is the entrance of surface drainage into any drinking water supply which is to be used without careful purification, because the surface water is likely to be the carrying medium for disease-producing bacteria found in the wastes of persons who have, or have had certain diseases."