

THE KENNY TREATMENT IN ACUTE POLIOMYELITIS
A Report of the First Year at the Iowa Lutheran Kenny Cottage

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(Presented before the Iowa Lutheran Hospital Staff Meeting, Des Moines, July 20, 1943)

On July 29, 1942, at the Iowa Lutheran Hospital in Des Moines, a pavilion for the treatment of acute infantile paralysis during the contagious stage was dedicated by Sister Elizabeth Kenny and named "Kenny Cottage" by her. During the year thirty-nine patients have been admitted with acute poliomyelitis in different stages and lengths of time after the onset. The varying symptoms and responses to treatment have been revealing to us.

Dr. Dwight C. Wirtz, orthopedist, and I attended the University of Minnesota School for Continuation Study in June, 1942, and became convinced that poliomyelitis should be treated in the acute stage according to the Kenny concept. We have been assisted in this work by Mrs. Louise Egenes Neveln, R.N., K.T., and two other technicians who had the six months training course for technicians at the University of Minnesota and Minneapolis General Kenny Clinics.

Some of our patients were brought in on the second day of their illness but more frequently from the fifth to the eighth day. We feel that the earlier the Kenny treatment is given the better. Since the first debilitating symptom of poliomyelitis is muscle spasm in the neck and back, and since this spasm may become so severe as to endanger the very life of the patient by inhibiting respiration, we feel that the early relief of this spasm is even life-saving. We had one good example of this condition in a patient twenty-one months of age. He came in on the fifth day of his illness with neck, back, and chest spasm so severe that during the first twenty-four hours it was not only

necessary to put hot packs on his chest and change them frequently, but it was also necessary to give breathing stimulation similar to artificial respiration. He was not placed in the respirator. The second day the muscle spasm began to relax, and each succeeding day his improvement was such that he left the hospital in three weeks with no muscle spasm or muscle weakness.

Although muscle spasm is generally in the posterior muscle groups, such as the neck, back, hamstring, gastrocnemius, and soleus, occasionally other muscle groups are involved. One child, four and two-thirds years of age, had severe muscle rigidity of the abdomen on the third and fourth days. The fact that she also had a white blood count of 14,000 and a fever of 102 degrees made it necessary to also consider the possibility of an acute appendicitis. One would think it rarely necessary to differentiate acute appendicitis and poliomyelitis. A concurrent throat infection was found, which was the probable cause of the fever and the leukocytosis since they were higher than usually found in poliomyelitis. The patient had so much back spasm that she lay in bed in an acute lordosis posture. With the use of hot packs and elevation of the thighs on pillows we were able to relax her back and abdomen and give her relief. She has made a good recovery after six weeks in the Kenny Cottage and three months in the convalescent home.

Muscle spasm may be limited to one muscle and cause a definite disability as was shown by a patient fifteen months of age. He had a rather mild poliomyelitis on

September 29, 1942, but had weakness of the right shoulder, so-called deltoid paralysis. He was sent to us in this condition on October 14, about one month after the onset. Examination revealed his shoulder weakness was merely alienation from muscle spasm of the latissimus dorsi muscle. Eight days of hot packs relieved this spasm and the alienated deltoid muscle began normal function.

Muscle spasm is painful, and if the Kenny treatment did nothing more than relieve the patients of their pain it would be well worth using. None of our patients were given sedatives. At night they were permitted to curl up on their sides or turn onto their stomachs to sleep in a national position. In fact, a standing order has been given not to permit the use of sedatives. We consider sedation dangerous to a patient with poliomyelitis, especially if the respiratory center is already depressed by the accompanying encephalitis. We had to learn this point the hard way in two instances when morphine and codeine were given before our rule was in effect. We had to place these two patients in the respirator until the effect of the opiate on the respiratory center wore off.

Each patient immediately on admission is taught by the technician the proper method of breathing to prevent incoordination of the accessory respiratory muscles. The confidence thus instilled in the patient by the technicians relieves him of the anxiety and fear of respiratory failure. He then is better able to cope with the situation of spasm of the chest muscles if it should occur.

Daily stimulation of the affected parts is begun by the technician in the acute stage. The object of early stimulation is to restore the neuromuscular association. Passive motion is soon started and the range of motion of each joint is limited to that arc

which does not cause pain, since pain will increase muscle spasm.

None of our patients was put in splints or casts. We have heard it said that the hot packs were splints. How can woolen blanket packs wrapped around the thigh, calf, and foot be a splint to a leg when all the joints are left uncovered?

The year 1942 was not an epidemic year and most of the cases were not severe. We had a few unusual occurrences. There were more high cervical and cranial nerves involved than usual. We had two patients with facial muscle weakness; three with palate weakness; three with sternocleidomastoid muscle weakness; one with upper trapezius muscle weakness; and three with diaphragm weakness, unable to cough. There were two cases of total paralysis. These patients required the respirator. In our opinion this is the only type of poliomyelitis in which the respirator is essential. If the respiratory difficulty is due to muscle spasm of the intercostal, or pectoralis muscles, hot packs will relieve it, whereas the pull of the iron lung would increase the muscle spasm. The respirator does not benefit patients with the bulbar type of poliomyelitis since their breathing is so incoordinated that they cannot breathe with the iron lung and may aspirate mucus or water into the lung. We had one patient with the bulbar type, a man twenty-six years of age, who developed pneumonia and died. It was the only death in the thirty-nine cases. There were two other patients who had weakness and incoordination and five others had dysfunctioning muscles in the arms. A great number had no definite weaknesses develop and had only muscle spasm in the neck, back, and hamstring muscles.

In most cases the temporary bowel and bladder dysfunction was a considerable problem the first week of the illness. The bowels invariably did not move without

artificial aid. We made it a rule to give epsom salts by mouth and 1-2-3 enemas the first few days. In this we were following the suggestion of Toomey¹ of Cleveland. The bladder would not empty but would become overfilled and unless catheterization was performed, an overflow dribbling would begin. We consider the care of the bladder an important part of the early care of patients with poliomyelitis. We had several old cases this year in which the patients had developed kidney and bladder calculae. By catheterizing the patients and turning them on their abdomens twice a day, we had had no calculae in this group of thirty-nine patients. There are two factors which brought about this improved condition: First, moist heat on the lower back and abdomen relieves the muscle spasm and aids the return of normal function; and, second, no leg and hip casts are applied which would keep the patient inactive and helpless on his back.

We have no braces or orthopedic devices on any of our patients, and of the thirty-nine admitted, twenty-eight are entirely well, three patients whose legs were involved walk very well with only slight limping, two have to use Kenny sticks to walk and two more are still under treatment but can bear weight and take a few steps. The two patients with total paralysis are only able to sit up. As noted in the accompanying table, some of the patients come to use eight months after the onset. One man had had orthopedic treatment and full leg braces made only four months after the onset. He now has been treated four months and already has good leg function without braces; his greatest weakness is in one arm and shoulder.

The diet has been kept rather high in protein since many of our patients were growing children. We have given extra milk. All patients have been given cod

liver oil and vitamin B. We have not used the high vitamin B reported by one clinic² but have given a high normal dose. We have found it necessary to give salt tablets, especially in the hot summer weather, because of the profuse perspiration. We have not used prostigmine in any of the acute cases. We have been able to relax the patients by the hot fomentations. We have given four of our 1940 patients, who had persistent spasm, prostigmine according to the method of Kabat and Knapp³ and obtained considerable relaxation in three of them.

X-ray treatment was used on the spinal nerve roots according to the method of Bordier⁴ on four patients, two with total leg weakness, one with arm weakness, and one who was paralyzed in both arms and both legs. Both the patients with leg involvement and the one whose arm was affected improved faster and more completely than any similar patients so afflicted at the onset. We believe the treatment merits further use. There is considerable physical difficulty in giving these deep x-ray treatments to the patient during the quarantine period.

The tabulation of the thirty-nine acute cases bring to attention the age of the patients; none were infants and many were past childhood. It shows that seasonal predominance is July to November. We have two children who were attacked in January. The table shows the length of hospitalization and in many instances spinal fluid cell count. It also shows that practically every patient had neck and back spasm, nearly all had hamstring muscle spasm, and a large number had gastrocnemius muscle spasm.

Since not all weakness is paralysis, we have chosen to list the muscle weakness at the onset as such. The condition of all patients at this writing (July, 1943) is difficult to report. We have had our

patients return for checkups and feel it is important to do so, since overactivity has brought back muscle spasms and changed functions of arms, backs, and legs in some who thought they were well.

We have treated thirty-five patients who suffered from the illness in previous years who are not listed in the table. Some patients who were attacked one and two years ago have been improved to the extent of walking without braces; many have had incoordinations corrected by muscle re-education.

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SUMMARY OF PATIENTS TREATED AT IOWA LUTHERAN KENNY COTTAGE DURING FIRST YEAR OF OPERATION

Patient— Age in Years	Date and Place of Onset	Date of Admission	Date Discharged	Length of Hospital Stay	Spinal Fluid Cell Count	Muscle Spasm	Muscle Weakness	Result of Treatment and Present Condition
E.H. 8	7-27-42 Des Moines	7-28-42	8-16-42	3 wks.	50	Posterior neck and back	None	Complete recovery; in school
M.P. 40	7-3-42 Des Moines	7-29-42	11-5-42	3¼ mos.		Posterior neck, arms, back, and hamstrings	Left upper trapezius and coracobrachialis	Complete recovery; teaching school
H.Z. 9	8-1-42 Maxwell	8-4-42	11-1-42	2 mos.	37	Posterior neck, back, abdomen, and hamstrings	Both psoas, biceps femoris, and quadriceps	Good recovery; in school
R.V. 4½	7-4-42 Des Moines	8-5-42	10-3-42	2 mos.		Posterior neck, back, and hamstrings	Sternocleidomastoid	Complete recovery
B.K. 27	7-22-42 Perry	8-8-42	9-13-42	1 mo.	18	Posterior back and hamstrings	Left quadriceps, right deltoid, coracobrachialis and supraspinatus	Complete recovery
L.W. 1¾	8-3-42 Grinnell	8-9-42	8-30-42	3 wks.	34	Posterior neck, back, and chest	Diaphragm and intercostal	Complete recovery
M.L.D. 32	7-6-42 St. Louis, Mo.	8-11-42	3-14-43	7 mos.		Posterior neck, back, arms, and legs	Neck, shoulders, back, arms, hands, thighs, legs, feet, and abdominal	Walks with Kenny sticks; weak left tibialis posticus, right deltoid, coracobrachialis, infraspinatus and teres minor
C.L. 17	8-4-42 Runnells	8-13-42	9-28-42	1½ mos.	15	Posterior neck, back, and hamstrings	Upper trapezius	Good recovery
L.B. 20	8-16-42 Des Moines	8-17-42	9-25-42	1¼ mos.	34	Posterior neck, back, and shoulder	Abdominal	Complete recovery; working in garage
M.C. 2	8-19-42 Montezuma	8-21-42	12-10-42	3¼ mos.	213	Posterior neck and back	Left quadratus lumborum	Complete recovery
J.S. 3	8-21-42 Des Moines	8-21-42	9-12-42	3 wks.		Posterior neck, back, and hamstrings	Sternocleidomastoid	Complete recovery
V.W. 16	8-19-42 Lamont	8-24-42	9-16-42	3 wks.		Posterior neck, back, and hamstrings	Bladder, rectus abdominal, diaphragm, obliques, psoas, biceps femoris, and quadriceps	Complete recovery
B.B. 11	8-26-42 Des Moines	8-27-42	9-17-42	4 wks.		Back and hamstrings	Psoas, biceps femoris, gluteus medius and minimus	Complete recovery; in school
M.C. 7	8-28-42 Des Moines	8-29-42	10-7-42	1¼ mos.	1	Posterior neck, back, and hamstrings	Both quadriceps and biceps femoris	Complete recovery; in school
E.C. 25	8-1-42 Des Moines	8-31-42	4-18-43 (Left, not discharged)	7¼ mos.	110	Back, diaphragm, intercostal, abdominal, and both legs	Diaphragm, back, intercostal, abdominal, and both legs	Normal breathing; patient could bear weight on the legs when she left the hospital
J.H. 9	9-5-42 Norwalk	9-6-42	9-27-42	3 wks.	22	Posterior neck and back	None	Normal
D.W. 14	8-4-42 Des Moines	8-9-42	10-8-42	2 mos.	40	Posterior neck, back, hamstrings, and gastrocnemii	Psoas	Complete recovery
G.H. 7	9-10-42 Montezuma	9-12-42 5-25-43	1-6-43 In Hospital	3¼ mos.		Posterior neck, back, pectoral, hamstrings, and gastrocnemii	Complete paralysis chest, back, abdominal, arms and legs; in respirator three weeks	Still in hospital, can sit and move arms some; chest movement fair, cough weak

A.N. 6	9-9-42 Kingsley	9-18-42	1-18-43	4 mos.	218	Back and hamstrings	Right leg, quadriceps, and psoas	Walks without a brace; right gastrocnemius still a little tight
E.E. 5	9-14-42 Stanhope	9-18-42	2-20-43	5 mos.	44	Posterior neck, back, and hamstrings	Right leg, quadriceps total and other muscles partial	Walks without a brace; some weakness and atrophy in thigh
A.K. 33	8-1-42 Indianapolis, Ind.	9-22-42	11-14-42	2 mos.		Posterior neck and facial	Sternocleidomastoid, facial, left pectoral and abdominal	Complete recovery; working full time
J.H. 5	9-18-42 Eldon	9-27-42	2-20-43	5 mos.		Back	Left rhomboidii, infraspinatus, teres minor, and deltoid	Weakness in shoulder and arm
M.P. 11	10-1-42 Winterset	10-1-42	11-1-42	1 mo.	190	Posterior neck, back, and hamstrings	Psoas, biceps femoris, gluteus minimus and medius, and quadriceps	Complete recovery; in school
F.K. 2	9-29-42 Des Moines	10-1-42	11-5-42	1 mo.	14	Posterior neck, back, and hamstrings	Right psoas and biceps femoris	Complete recovery
J.L. 15	9-25-42 Ames	10-4-42	11-8-42	1 mo.	45	Posterior neck, back, and hamstrings	Psoas, gluteus minimus, biceps femoris, and quadriceps	Complete recovery; in school
C.L. 13	9-23-42 Ames	10-5-42	11-15-42	1¼ mos.	10	Posterior neck, back, and hamstrings	Facial, left sternocleidomastoid, deltoid, and coracobrachialis	Complete recovery; in school
G.W. 17	10-8-42 Sioux Rapids	10-14-42	11-13-42	1 mo.		Posterior neck, back, and hamstrings	Left facial, right sternocleidomastoid and palate	Complete recovery
R.G. 1¼	9-19-42 Kingsley	10-14-42	10-22-42	1 wk.		Right latissimus dorsi	Right deltoid	Recovery
L.C. 18	10-22-42 Earlham	10-30-42	2-6-43	3¼ mos.		Posterior neck, back, and hamstrings	Left hand flexors, opponens pollicis, right biceps femoris	Weak left opponens
L.P. 16	9-26-42 Kelley	10-30-42	2-4-43	3¼ mos.	101	Posterior neck, back, and hamstrings	Right coracobrachialis and biceps femoris	Good arm recovery; hamstrings slightly tight
M.M. 2	8-1-42 Des Moines	11-11-42	12-6-42	1 mo.		Posterior neck, back, and hamstrings	Bladder, left leg	Walks
P.MeM. 17	10-27-42 Paducah, Ky.	11-19-42	Still in hospital			Back and hamstrings	Bladder, left coracobrachialis, biceps and triceps, both hip adductors, abductor flexors, abdominal, hamstrings, quadriceps, right tibial, peroneal, gastrocnemii and toe extensors	Walks with Kenny sticks; arms completely recovered; right leg weak, bears weight without braces
R.K. 26	12-5-42 Iowa Falls	12-10-42	12-26-42 Deceased	16 days		Posterior neck, back, chest, and hamstrings	Bladder, chest, abdominal, left arm, and right leg	Deceased
L.B. 16	12-26-42 St. Louis, Mo.	1-5-43	5-6-43	4¼ mos.	300	Back and hamstrings	Gluteus maximus, medius and minimus; right adductors, quadriceps, tibial, peroneal, biceps, and hamstrings	Walks with Kenny sticks; weak right leg
B.P. 3	1-1-43 Des Moines	1-6-43	2-4-43	1 mo.	175	Back and hamstrings	Both psoas and hamstrings	Complete recovery
J.M. 4¾	1-11-43 Des Moines	1-12-43	2-26-43	1½ mos.	73	Back, abdominal, and gastrocnemii	Right psoas and quadriceps	Complete recovery
F.W. 10	11-1-42 Des Moines	2-1-43	6-10-43	4 mos.		Back, pectoral, hamstrings, and gastrocnemii	Left psoas and hamstring	All muscles functioning; hamstrings tight
T.R. 32	10-15-42 Coon Rapids	2-17-43	Still in hospital			Back, hamstrings and gastrocnemii	Diaphragm, sternocleidomastoid, trapezii, latissimus dorsi, intercostals, abdominal, and general of legs, left flexors of hand and thumb, and pronators and triceps	Walks with Kenny sticks, no braces; arms and hands still weak
J.E. 16	8-24-42 Underwood, N.D.	4-23-43	Still in hospital	In Bismarck hospital 8 mos.		Posterior neck, back, chest, both arms, and both legs	Total; in a respirator	Still in the respirator at night; chest and arms are relaxing