

BOTULISM

*A Nursing Care Study, by EULA MORGAN,
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Mrs. N, a housewife, was forty years old, and weighed approximately two hundred and forty pounds. When she was admitted to the hospital, her only previous illness had been a mild affection of the bronchial tubes, which was treated and arrested without surgery. The immediate family consisted of a fond husband and two jolly, healthy boys in their teens. Mrs. N possessed a pleasing personality and was not easily depressed when in normal health. She was natural, sincere, and intelligent.

At two o'clock on the afternoon of 17th January Mrs. N ate a small piece of pork that was not well cooked. Because of its unpleasant taste she ate only a bite from the serving given her. She felt normal until the following morning. Then on attempting to rise, her legs gave way and she fell forward. She arose, and, with swimming head, staggered to the kitchen to prepare breakfast. Later, when pouring the coffee, she could not distinguish the cream in the cup from the cup, nor the colour of the pot from the coffee. During the morning she was progressively dizzy. She began washing dishes and placed the silver ware on the floor, thinking it was the table. She felt well. There was no nausea, or cramps, but a continued lack of muscular coordination.

At two o'clock in the afternoon (18th January) she opened the door to go outside and fell to the ground. For a while she lay there, too stunned to feel the pet dog as he licked her face, though she was fully aware of it. Eventually she managed to get up the steps and to bed. Later, as she tried to eat, her head hung over the tray and she could not see at all. A doctor was called in and his diagnosis was a mild "stroke" or cerebral haemorrhage.

As Mrs. N continued to get worse, the family physician was called. On his arrival, she could barely talk to him. Her voice was low. She had vertigo when sitting or when lying upon the bed. Her teeth and fingernails felt as though they were falling out and there was a constant ringing in her ears, but she was never unconscious. Her neck muscles and face were sore and swollen. Defecation was involuntary. Though she could move both legs she could stand on neither of them. Everything she touched felt as though it were silk and the prick of a pin seemed as dull as a match or stub. There was marked photophobia and her blood pressure was 160/118, normal for her being 137/85.

Mrs. N was brought to the hospital two days after becoming ill. The attending physician's tentative diagnoses were botulism, paraplegis, or paralysis of the levator ani muscle.

Botulism is caused by the toxin of *Clostridium botulinum*. It is flagellated, motile, spore forming, and anaerobic. The bacillus was isolated by Van Ermengen, a German. It is a saprophyte,

and thrives best in alkaline media. Being very resistant to heat, it is not difficult to find in rare meats. It is taken into the body by eating infected foods.

On entering the body, the *Bacillus botulinus* toxin causes prostration, toxæmia, and muscular paralysis. It affects the respiratory movements. This is followed by general weakness, headache, constipation, disturbance of vision, difficulty in swallowing, and thick speech. There is usually no elevation of temperature. The sensorium remains clear.

Autopsy shows a parenchymatous degeneration and ecchymosis, but especially degeneration of the ganglion cells.

The nurse listened with interest, as the doctor explained that the patient should be kept dry and off of her back to prevent decubitus. Other orders were:

1. Culture of the stool and urine.
2. Blood chemistry and Wassermann.
3. Preparation for a spinal puncture.
4. Codeine, grain one half, and aspirin, grains ten, as often as necessary.
5. Sodium bromide, grains thirty, every four hours.
6. Only orange juice for diet.

When the patient was admitted to the ward, the curtains, fortunately a sober brown, were drawn to prevent glare. Pillows were placed at her back and between her knees. A specimen of urine was collected for culture. The nurse explained to Mrs. N the necessity for staying off her back. She drank the cold, fresh orange juice as though she were hungry.

The following morning Mrs. N sat on the bedside in position for spinal puncture, but she had to be supported by the nurse because of her general weakness. There was a sharp expression of pain as her lowered head touched the nurse's arm, due to the sensitiveness of the patient's eyelids. The spinal fluid was drawn out, labelled, and sent to the laboratory for culture and routine examination.

During the delayed morning care the nurse soaked the patient's hands and feet longer than usual in the warm soothing water. Mrs. N seemed to enjoy the brisk alcohol back rub. Powder was sprinkled on the quilted pad as well as on her back and in the folds of the skin that, due to her obesity, were likely to become irritated. Her position was changed to the right side and several pillows placed for her comfort.

That day the doctor ordered a soft diet for Mrs. N. As the nurse set up the tray she was thinking that feeding the patient would not be easy. However, regardless of her difficulty in swallowing the food and her hushed thick voice, Mrs. N talked with intelligence and a sense of humour. The process was slow, but when the tray was removed she had eaten the eggs, cereal, apple sauce and some toast, and drunk the hot coffee.

Near eleven, that day, a soapsuds enema was given to obtain the specimen for culture. Catheterization for a sterile specimen of

urine was a more difficult task as the patient could not control her legs enough to keep them in position, so an assistant was called.

There was a standing order for irrigation of the eyes with a saturated solution of boric acid, followed by drops of ten per cent. argyrol and application of yellow oxide of mercury. In addition to aseptic technique this required gentleness, as Mrs. N's eyelids and muscles were sensitive to the slightest touch. The treatment was given twice daily.

The patient brushed her teeth twice a day, for exercise as well as cleanliness.

In spite of bromide, codeine and aspirin, Mrs. N suffered from headache, which was relieved to some extent by ice caps. Her graphic temperature sheet showed an elevation only one day, when it was 99.4 degrees Fahrenheit.

On the eighth hospital day two drams of Epsom salts were given, as Mrs. N was consistently constipated. She voided only when in an upright position. A slight rash on the inner side of the thigh near the groin was dried with the application of mercurochrome twice a day and routine cleanliness.

Other medications and treatments were continued. The bed was kept dry and free of wrinkles. Mrs. N began gradually to open the affected left eye a little. Fluids and fruit juices were given frequently.

The doctor ordered A, B and D vitamin capsules, to be given two after each meal and before bedtime—eight daily. Near the end of her second hospital week she was given a full diet and was learning to feed herself.

Two drams of magnesium sulphate were ordered as often as necessary to produce a watery stool daily, and the alcohol rub was given twice a day rather than once. Her daily exercises consisted of bending her arms and flexing her knees.

Mrs. N was of a cheerful nature. She became depressed and almost despondent only once, when she attempted to stand. The nurse and orderly assisted her in getting up, but when she tried to stand, her legs were still weak. They helped her to bed, after which she sat up with the aid of a back rest for a short while.

On Mrs. N's fifteenth hospital day, the nurse began to give daily intramuscular injections of one cubic centimetre of a preparation of vitamin B, which provided 16,666 international units each day.

Mrs. N slept well. Her only requests during the night were for water, or occasionally an ice bag. Her husband and sons, with their cheery conversation and affection, came about seven or eight each night. She was always in a better mood for visitors after the regular evening care had been given and her light put out. She called glare her "worst enemy".

On the thirtieth hospital day Mrs. N was discharged from hospital and taken home. She could see well, and her eyelids were movable, though still a little sensitive to light. The numbness had left her fingers and sensation was again normal. She could not

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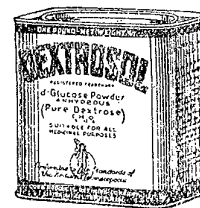
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stand but could control the movement of her extremities. Her face was no longer swollen and her soft voice was again distinct and clear. Due to careful nursing she had no pressure sore in spite of her obesity. As we waved "goodbye" to her the doctor said that it probably would be several months before she would be in completely normal health again.

Once at home, the inventive boys devised an arrangement of ropes by which their mother could move herself more freely. She is taking thiamin chloride tablets once daily. Each tablet contains 3.333 milligrams of thiamin chloride, equivalent to 1,100 international units of vitamin B. As she can see and use the muscles of her eyes, the antiseptic eye wash has been discontinued.

She is anxiously but cheerfully awaiting the day when she will be able to walk around and do her work again, as no maid, however conscientious, can clean the shelves as she does! She will always beware of "little pork bits"!

The result of a consultation with an eye and throat specialist is shewn by the following report: This patient has such an acute photophobia that I did not examine fundi or pupil, but she has bilateral ptosis with an almost complete ophthalmoplegia externa and diplopia, weak voice, and very little motion of palate or of the larynx on swallowing.

An examination of the spinal fluid showed an abnormal pressure of 30 millimetres, the normal being 10 to 15 millimetres, of mercury. The laboratory report was:

	Mrs. N.	Normal.
Cell count	2-3	10
Globulin	1 plus	negative
Wassermann	negative	negative

A piece of the pork which Mrs. N had eaten was cultured. The *Bacillus botulinus* being present removed any doubt of the diagnosis of Mrs. N's case.

Drugs Used:

Sodium bromide is a salt formed by a chemical reaction of an alkali with hydrobromic acid. Bromine is found in sea water. The average dose of sodium bromide ranges from 1 to 4 grams, or grains 15 to 60. It is a sedative, affecting the central nervous system.

Epsom salts is an old name for magnesium sulphate, a chemical compound that may be given as a saline cathartic or to reduce body oedema. The average dose is 0.2 to 30 grams.

Acetylsalicylic acid or aspirin is a coal tar preparation given to relieve headaches, migraine, and rheumatic pains; average dose 5 to 20 grains.

Codeine sulphate is an opium derivative given to relieve pain. It has little side action, but is habit forming; dose $\frac{1}{2}$ to 1 grain.

Argyrol is a 19 to 30 per cent. silver preparation. It has an astringent and also germicidal effect upon tissue. As the silver is combined with a protein base it is not irritating to tender surfaces. For this reason it is especially appropriate for an eye antiseptic.

Boric acid is a compound of boron, hydrogen and oxygen. It is mildly antiseptic and used chiefly for inflamed mucous membranes, such as those of the eyes, nose or throat. It is valuable as a gargle also. The preparations range in strength from two per cent. to a saturated solution.

Yellow oxide of mercury is an oxidized mercury ointment. It is beneficial in relieving inflammation and acute infection of the mucous membranes.

Thiamin chloride is crystalline vitamin B1 hypochloride. This was given to Mrs. N intramuscularly (16,666 international units daily) and later by mouth (1,000 international units daily). These preparations were for development or repair of the degenerated nerve cells; also to restore stamina and improve health in general.

I attempted to teach Mrs. N three things:

- (1) The value of sanitation in preparing foods.
- (2) That fluid and fruit juices aid in having a daily elimination and that it is important to establish a habit of daily elimination.
- (3) That obese or short, stocky people should eat bland and less concentrated foods.

I learned from the case:

- (1) The facts about botulism, including its cause, treatment, and symptoms.
- (2) That a person may have a nerve affection and yet retain a wholesome mental and emotional attitude.
- (3) That family ties and devotion aid the progress of recovery in any case. They prevent worries, or at least they did in this case, and give hope and encouragement to the patient.

Nearly eight weeks after Mrs. N had been discharged from the hospital the doctor triumphantly asserted that Mrs. N could walk.

Mrs. N is still taking the thiamin chloride tablets and will continue them for six months.

Sources of Information:

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The attending physician, intern and instructor.

The patient's chart and testimony.

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