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MYSTERY MATTERS

The Mystery of the Poisoned Boy

by **Dian Dincin Buchman**

No one knew it at first, but the boy had been poisoned. His teacher was the first to notice his sudden change from a smiling, enthusiastic boy to a frightened, lifeless child. She asked the principal to call his mother immediately to take him home. This was just the beginning of a frightening medical mystery.

Eight-year-old Miguel Torres (not his real name) seemed only a little sick when his mother, Maria, took him to the doctor. Because the doctor didn't see anything wrong he sent Miguel back home to rest. The doctor was completely surprised when the Torreses were back in his office an hour later. Miguel's mother was in a panic, but the doctor could now understand why. There had been abrupt and dangerous changes in Miguel. His skin looked washed out. He couldn't open his eyes, his body was limp, and his muscles were twitching. His heartbeat was uneven, and he felt sick to his stomach.

Suddenly Miguel had diarrhea. Then he vomited. Even more suddenly he was cold and senseless—almost unconscious. Knowing no logical reason for the rapid disintegration of Miguel's health, the doctor telephoned a leading Fresno pediatrician, Dr. John P. Conrad, Jr., an expert in children's diseases.

Dr. Conrad, who was associated with a hospital that worked only with children, realized that this case was urgent. He telephoned ahead to the Valley Children's Hospital and ordered a blood test to check for diabetes. When Miguel and his mother arrived, everything was ready. The tests were finished by the time Dr. Conrad dashed in. The blood

test didn't show diabetes. But there was an alarming problem with Miguel's white blood cell count. It was abnormally high.

Miguel's skin was not only very pale, but now it was also cold and clammy. His heart was racing, and the muscles of his hands and feet were twitching. Dr. Conrad noted a new and important symptom. The pupils of Miguel's eyes had narrowed to tiny specks. The pain in his stomach area was so bad he screamed when the doctor touched him lightly during the examination.

Dr. Conrad started at Miguel. Whatever was wrong with the boy had obviously gotten worse.

What could it be? Was it bacteria that caused his violent diarrhea? Dr. Conrad tested for shigella, a bacterium that causes diarrhea. But the test came back negative.

Dr. Conrad had a hunch chemical poisoning was causing the damage. The symptoms pointed that way. He ran Miguel's symptoms through his mind. Miguel was acting strangely. He looked lifeless, and he had a terrible stomachache. His pupils were almost invisible.

What kind of poisoning could it be? To Dr. Conrad's practiced eye, Miguel's acute illness looked as if it could be a reaction to an organic phosphate. Fresno is a big industrial farming area. The farmers were always spraying chemicals to kill insects. Perhaps Miguel had inhaled some toxic insecticide from a crop duster or local farm sprayer.

Dr. Conrad needed some leads. Mrs. Torres hesitantly told him that Miguel had mentioned seeing a spray machine and a spray plane that morning on the way to school. Dr. Conrad knew that organic phosphates are dangerous and can penetrate the skin. The symptoms show up in a few hours.

The facts weren't all in yet, but because of Miguel's condition and the possibility of it being a spray, the doctor decided to treat the case as if it were caused by an organic phosphate. He had no other ideas.

Dr. Conrad had to accomplish three things to help Miguel survive while he tried to solve the mystery. First he had to replace the fluids that Miguel had lost with his violent vomiting and diarrhea. Dr. Conrad ordered intravenous fluids to be dripped into Miguel's vein. The doctor's next job was to fight against the poison in Miguel's body. He had previous experience with chemical poisoning and had used the lifesaving drug atropine with good effect. Finally Dr. Conrad needed to extract the poison, but he couldn't do that until he knew which poison it was. In order to find that out he needed accurate blood tests. At eight-thirty that night he had the blood tests back. It was organic phosphate poisoning. He had made the right guess.

The emergency staff at Valley Children's Hospital were now checking Miguel every few minutes. The drug Dr. Conrad had chosen was working like a charm. If it hadn't, the doctor would have had to use an even more powerful drug. But everything was going so well Conrad decided he didn't need to. By ten o'clock Miguel's condition had stabilized. Dr. Conrad was satisfied and went home.

Miguel continued to do well on the fluids and the atropine for several days. In the meantime, the local sprayers were questioned. Their answers surprised Dr. Conrad. They had not used organic phosphate on the crops. This was a puzzle! Where then did Miguel pick up the organic phosphate poisoning?

After six days in the hospital Dr. Conrad was delighted to see Miguel in his private office, well and back to normal. The doctor sent Miguel home to rest for a week. Dr. Conrad examined his next two patients, but his office nurse interrupted him with an emergency. Mrs. Torres was back in the office, and she was in a panic. Miguel again! He was so sick he couldn't get out of the car.

Dr. Conrad rushed out to the parking lot. Miguel was now sweating and breathing hard. He was in a state of shock. He couldn't move his legs. Maria Torres explained that Miguel had gotten sick almost as soon as they had left the doctor's office. She had turned the car around and raced back to the doctor.

Dr. Conrad jumped into the car and told Mrs. Torres to drive back to the hospital as fast as she could.

All this seemed like a nightmare to Dr. Conrad. The case was repeating itself, only this time Miguel appeared to be even sicker than before. Miguel's violent cramps began again. He began to vomit. Dr. Conrad repeated his first prescriptions: fluids and atropine. Because the boy seemed in so much danger, he also added a more powerful drug.

Luckily Mrs. Torres had the presence of mind to turn her car around and come back to the doctor's office. This was a matter of life and death. The doctor and the nurses hovered around Miguel for the next few hours, and then slowly, slowly they saw some small improvement. Miguel would live. Dr. Conrad and the staff were ecstatic.

By the next morning, Miguel stabilized. Everyone agreed he had made an unusual and remarkable recovery.

Now there was time to stop and think about the cause of Miguel's strange illness. If Miguel had been poisoned somehow, and it hadn't been by a crop sprayer, how had he picked up the poison?

Conrad called the Fresno County Public Health Department the next morning and told them the facts of the case. Miguel had recovered and was doing well after a week at home, but he had then become critically

ill one hour after seeing the doctor. Conrad asked for help in tracking down the source of the organic phosphate poison. Because the last episode happened in the car, maybe it was the Torres' car. Dr. Conrad also advised the health department that they should check everything the boy was wearing: the problem might be with his clothes.

An investigator and an assistant were sent out immediately. Soon they were talking with Mrs. Torres, checking for sprays around the house, garage, and car.

They checked to see if there was a garden spray or insecticide bomb. No. Did the family have phosphates in the garage, laundry area, or kitchen? No. What about Miguel's clothes? Mrs. Torres showed them the blue jeans and shirt Miguel had worn that day.

There was a store label on the blue jeans. They asked Mrs. Torres if she had bought the jeans at that store. Her answer interested them. She had not bought them at a store, but had found them at a salvage sale at a local trucking company. She told them the jeans had looked perfect when she bought them, and they were so cheap she bought five pairs.

They asked if her son had worn all five pairs. "No," she answered, "only one." Actually, Miguel had worn this same pair two times. He wore them to school the day he got sick. And he had put them on again when he left the hospital, the day he saw the doctor.

The investigators couldn't contain their excitement. This had to be the answer! Miguel had been wearing the jeans both times when he had become so violently ill. It had to be the jeans.

To be absolutely sure, the health department workers decided to give the jeans a mosquito test. They carefully wrapped the five pairs of jeans and took them to the state health department laboratory. Here tab technicians put the jeans in the cage of one of the mosquito colonies they were breeding. Fifteen minutes later, every mosquito in that colony had died. Strangely enough, a nearby colony in the lab died five minutes later. The second colony hadn't even had direct exposure to the jeans. The poison in the jeans was deadly.

Now the health department needed to find out three things: the product name of the poison (there are about 25 commercial phosphates sold in the United States); how many jeans had been contaminated by the poison; and the names of any other people who had bought jeans at the sale. Other children could get sick, too.

At that very moment, something else was happening at the Fresno General Hospital. As Dr. Conrad was making the rounds of young patients with the resident and interns, he shared with them the entire story of Miguel and his poisoned pants. This turned out to be a lucky coincidence for another eight-year-old.

The very next day, the chief resident telephoned Dr. Conrad for some advice. The resident had a young patient (whom we shall call Jimmy) who had come into the hospital with many of the same symptoms as Miguel.

Jimmy had been vomiting, and he was dizzy and sweating. Like Miguel, when he was admitted to the hospital he seemed almost unconscious, and his pupils were so small you could hardly see them. The boy was also twitching and had severe cramps. Jimmy's own doctor was puzzled by these symptoms and at that time thought it might be acute rheumatic fever. But the resident had just heard the story of Miguel, and Jimmy's symptoms matched. He asked Dr. Conrad if he could test the boy for organic phosphate poisoning. The resident and Dr. Conrad together ordered the test that would reveal any poison.

The results came back in a few hours. The resident was right. The second boy was also poisoned by an organic phosphate. Now they would have to find out if this boy had the same kind of salvage-sale jeans. They checked with the boy's mother. Sure enough, the boy had been wearing a new pair of jeans. They, too, had been bought at a salvage sale.

The story was practically the same. Jimmy had worn the jeans to school and had become so sick the school had sent him home. He recovered slowly at home for a few days and then went back to school. Like Miguel, Jimmy had put on the same pair of jeans. Immediately afterward he had been rushed to the Fresno General Hospital, violently ill. Fortunately for Jimmy, the resident had remembered and acted upon the unusual story Dr. Conrad had shared the day before.

Now there wasn't another moment to waste. The rest of the jeans had to be tracked down. Miguel's mother had bought five. This new pair made six. But how many other pairs were there in that salvage sale? The trucking company refused to cooperate, and said they didn't know the answers. The health department called all the local newspapers and the television and radio stations. They issued an urgent call: DID YOU BUY JEANS AT A SALVAGE SALE? THEY ARE DANGEROUS. BRING IN THOSE JEANS!

Four more pairs of jeans were returned to the health department. Later, the health department would find out there were only ten pairs in all. Of the four additional pairs returned, two had been worn. Strangely, the boys who wore these jeans never got sick. That small mystery was soon solved with a simple one-word answer: WASHING. The two pairs of jeans had been washed before the boys wore them. The washing had eliminated all of the poison.

Tracing how the jeans had been contaminated proved to be a more difficult task. Eventually the health department learned that the jeans had been shipped in a giant truck with both machinery and chemicals. No one knew how, but one five-gallon can of organic phosphate had leaked. This leak soaked ten pairs of jeans. The jeans shipment had stayed in a warehouse for some time, where the jeans dried and the visible stain from the chemical disappeared. However, when the jean order was delivered, the store didn't think the trousers looked fresh and clean. They returned the jeans to the trucking company. The jeans were then put into a distress sale at the trucking depot. As a result two mothers almost lost their sons.

SIDE BARS

Stuck synapse

The organophosphate pesticide that poisoned Miguel and Jimmy was Phosdrin™, also called mevinphos. Mevinphos acts on insects somewhat differently than on mammals, but its toxicity to people is still fairly high because it is a nerve poison, and its effects can build up over time.

Nerves don't touch each other. Chemicals called neurotransmitters send messages across the space, or synapse, between the end of one nerve and the beginning of the next. Acetylcholine is one of the most common neurotransmitters. Once the message is delivered, an enzyme called acetylcholinesterase decomposes the acetylcholine, essentially "cleaning" the synapse to ready it for another message. Organophosphates bind up the acetylcholinesterase so it cannot deactivate the neurotransmitter. When acetylcholine remains undecomposed in the synapses, it constantly stimulates the nerves to send unwanted messages, resulting first in mucous secretions and later in the severe muscle twitching and other symptoms the boys experienced.

Different antidote drugs relieve the symptoms of organophosphate poisoning in different ways. Some drugs break the chemical bond between acetylcholinesterase and the organophosphate, regenerating the enzyme's effectiveness. Drugs like atropine bind to the nerve itself and block acetylcholine's action. Atropine must be used carefully because it would poison a healthy person, eventually causing paralysis. It is helpful in poisoning cases, however, because excess acetylcholine is already present.

(Gail Marsella)

CAPTION

MEVINPHOS

BIOGRAPHY

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