Post-polio syndrome unraveling

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MRS. M, 69, IS ADMITTED to the unit with bilateral pneumonia. As you review her health history, you note that she had polio in 1951 and was diagnosed with post-polio syndrome (PPS) in 1998. You've never provided care for anyone who had polio; none of the nurses on your unit have either. As you assist Mrs. M into bed, you wonder what PPS is all about and how it will affect patient care.

Polio survivors can experience effects of the disease many years after they have recovered. Collectively known as PPS, characteristic signs and symptoms—progressive weakness, fatigue, myalgia, arthralgia, and muscle atrophy—can occur decades after the polio diagnosis. As survivors of polio age, you're likely to see more of them in acute care hospitals, both for problems related to PPS and for unrelated illnesses such as cardiac problems and complications of diabetes.

This article reviews the basics of PPS, how it affects patients later in life, and what you can do to provide them with the most appropriate, up-to-date care.

Dangerous disease

PPS affects some patients with a history of poliomyelitis, a highly infectious viral disease usually spread by contact with the stool or nasal/oral secretions of an infected person.[1] Initially, most patients infected with polio were asymptomatic or experienced flulike symptoms; most recovered without further complications and developed lifelong immunity. Less than 1% developed paralysis.[1]

Although about 95% of patients infected with the polio virus were asymptomatic or developed only mild symptoms, they could still spread the disease. Of patients who developed paralytic polio, 5% to 10% died from respiratory paralysis.[1] But most of them survived, so you're likely to see patients with PPS in your facility.

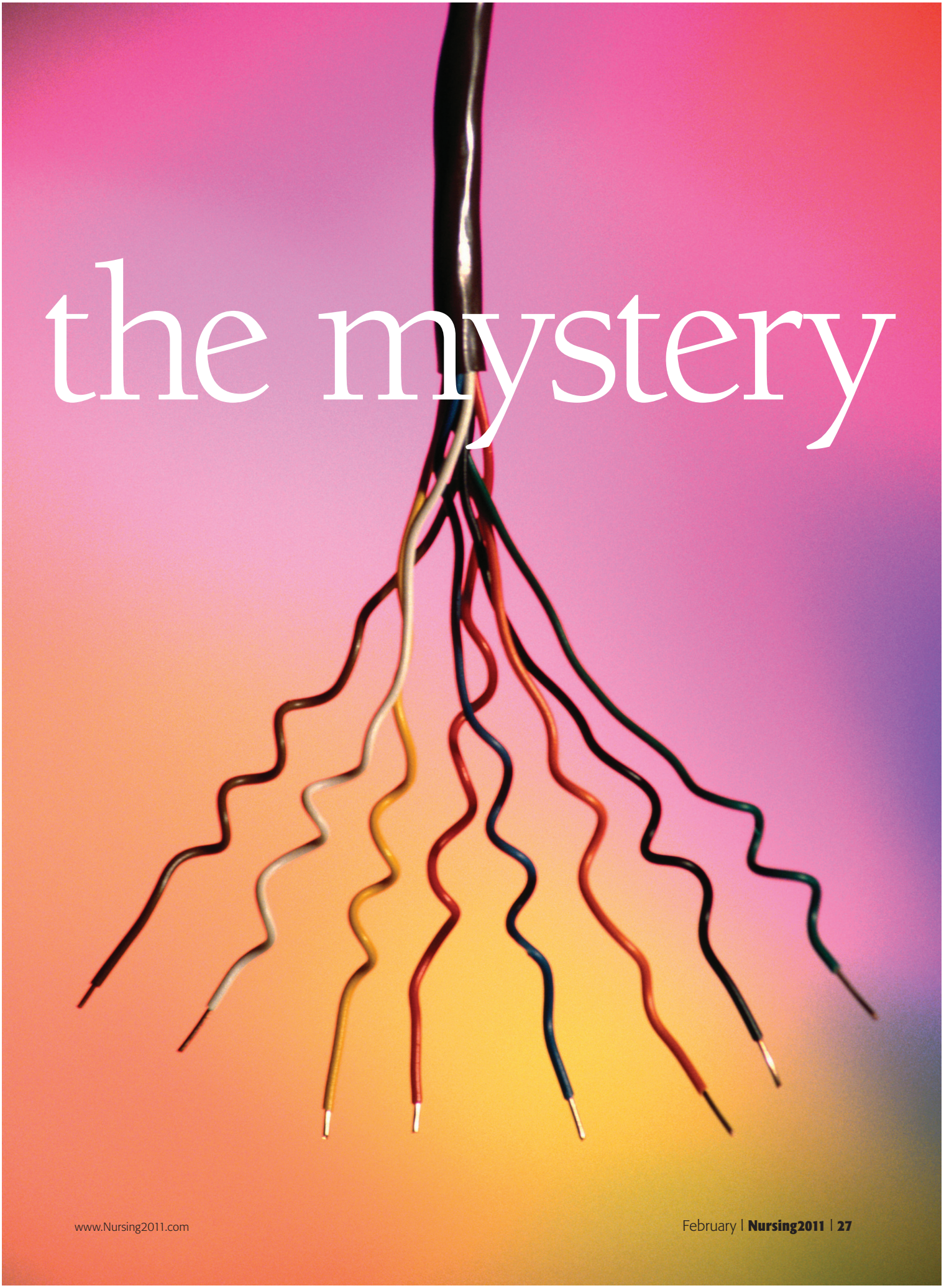
Before the Salk inactivated polio vaccine was used routinely in 1956, polio was the most feared childhood disease in the United States. In 1952, more than 21,000 paralytic cases were reported; after widespread immunization, only 61 cases were reported in 1965.[1]

The oral polio vaccine, developed by Albert Sabin in the late 1950s, was commonly used during the 1960s because it was easier to administer. Since then, however, it's been associated with a small incidence of vaccine-associated paralytic polio and hasn't been used in the United States for 10 years.[1]

Long-term effects

PPS typically develops 20 to 40 years after the onset of acute polio.[2] It's not contagious and usually not life-threatening.[3] For some patients, weakness of respiratory muscles due to

the mystery



PPS can impair ventilation, and weakness of muscles involved in swallowing can lead to dysphagia, aspiration, and aspiration pneumonia.[3]

No one knows exactly how many Americans have PPS. The National Center for Health Statistics estimates that the number of polio survivors may exceed 440,000, and that 25% to 60% of them may have PPS.[3] It's likely that many cases are undiagnosed, with their signs and symptoms misinterpreted as part of the normal aging process.

The cause of PPS is unknown.[3] A generally accepted theory is that neurons begin to degenerate during the acute polio attack, resulting in a lack of innervation to the muscle. The surviving nerve cells in the brainstem and spinal cord grow sprouts to compensate for the loss (reinnervation). This burdens the remaining nerve cells with an increased workload as they supply more muscle fibers than normal. These sprouts may degenerate over time because they become overwhelmed, eventually causing a new, late-onset weakness, or PPS.[4] Other theories include a reactivation of persistent poliovirus in the nervous system and inflammation and induction of autoimmunity.[5]

Recognizing PPS

Common signs and symptoms of PPS include:

- progressive weakness
- fatigue
- myalgia
- arthralgia
- muscle atrophy
- gait disturbances
- sleep disturbances, including sleep apnea
- respiratory problems
- difficulty swallowing
- cold intolerance.[2,6,7]

Muscle weakness may affect muscles that were severely affected by polio and muscles that were seemingly unaffected.[6] Some patients also develop visible muscle atrophy. Respiratory problems are most common in patients who had difficulty breathing during the acute illness.

The signs and symptoms of PPS progress slowly, often with periods of stability followed by further progression. Myalgia is often described as a deep, aching pain.[7]

Diagnosis of PPS is called a diagnosis of exclusion because signs and symptoms can indicate various diseases, including osteoarthritis, fibromyalgia, or multiple sclerosis.[8] Depression can also be associated with fatigue and must be ruled out or treated.[3] See *Diagnosing PPS* for a list of criteria that can help in diagnosis.

Diagnosing PPS[5]

The following criteria can help establish a diagnosis of PPS:

- a prior episode of poliomyelitis with evidence of residual motor neuron loss
- a period of at least 15 years after the acute onset of polio with neurologic and functional stability
- a gradual (or rarely abrupt) onset of new weakness and abnormal muscle fatigability that persists for at least 1 year
- exclusion of other medical conditions that cause similar symptoms.

Managing PPS

Although PPS isn't curable, many treatment strategies can help patients manage signs and symptoms. Because each patient presents differently, provide an individualized plan of care for each patient.[4] The most effective care is provided by a multidisciplinary team that includes a neurologist, a physiatrist, physical and occupational therapists, and nurses with expertise in rehabilitation and the psychiatric aspects of long-term disability.

Care for the patient with PPS focuses on alleviating or mitigating specific signs and symptoms. Interventions include:

- energy conservation strategies to reduce fatigue
- pain management
- strengthening exercises and appropriate assistive devices to improve mobility
- a nonfatiguing exercise program
- psychologic interventions to improve body image and coping.

Psychologic considerations

Because PPS signs and symptoms are often mistaken for other problems, patients may suffer significant emotional distress from a misdiagnosis of another neurologic disease, such as amyotrophic lateral sclerosis, or a lack of diagnosis in light of the vagueness of the symptoms. You can help patients to cope by encouraging them to verbalize their concerns and assuring them that there was nothing that could have been done to prevent PPS.

Opioids, anesthetics, sedatives, and other medications that depress the respiratory system should be used with caution in patients with PPS because they may be more susceptible to them.

Caring for Mrs. M

Upon admission, Mrs. M is withdrawn and prefers to be left alone. When she does speak, she says she's discouraged and fearful. She's been feeling very tired lately and is having difficulty swallowing. She knows that these are clinical manifestations of PPS. You acknowledge her concerns and assure her that you'll work with her and the rest of the healthcare team to address and manage her signs and symptoms.

For patients such as Mrs. M, energy conservation is of primary importance. Make sure your patients with PPS receive uninterrupted rest periods throughout the day. Limit visits from therapists, social workers, case managers, dietary workers, and housekeeping personnel. Ask them to group their activities so patients can have several uninterrupted rest periods. Visitors can also be tiring; discuss this with your patients and encourage visitors to limit the length of their visits. Make sure patients take rest periods before and after therapy so they can participate fully.

Watch for nonverbal cues that patients are experiencing pain and

On the Web

Post-Polio Health International:
www.post-polio.org
Post-Polio Syndrome Central:
www.skally.net/ppsc

encourage them to determine a pain management goal and plan that's acceptable to them. Therapeutic interventions include nonsteroidal anti-inflammatory drugs and acetaminophen, as well as massage, relaxation, and applications of cold and heat.[7] These interventions will let them participate more thoroughly in therapy sessions and improve their overall functioning. Advise patients to regularly perform the strengthening exercises prescribed by the physical therapist.

Assistive devices such as walkers and canes or orthotics such as braces and splints can help decrease mechanical stress on joints. Some patients may benefit from installing a chair lift in their homes. Encourage obese patients to lose weight to decrease stress on their joints and improve their mobility.

Swallowing difficulties are common in patients with PPS and can lead to aspiration pneumonia. Obtain an evaluation by a speech therapist, who will teach them techniques to minimize aspiration, such as turning the head to one side while swallowing. Food consistency may need to be modified for safety. Help patients sit fully upright for meals, preferably out of bed.

Some patients with PPS develop sleep apnea, so they should be evaluated for this disorder. If diagnosed, it's treated with continuous or bilevel positive airway pressure ventilation.

Support groups can help patients with PPS feel they're not alone. For patients who have limited mobility or live in rural areas, online groups and chat rooms may allow them to connect with others. (See *On the Web* for resources.)

Know your syndrome

PPS can complicate comorbidities and affect the care your patients receive. Knowing they have this syndrome and taking the proper steps to manage their signs and symptoms will help keep PPS under control. ■

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