

Polio Australia

Improving health outcomes for Australia's polio survivors

Late Effects of Polio: Do you know the signs?

Pathophysiology of Late Effects of Polio (LEoP)

Acute poliomyelitis (polio, also known as infantile paralysis) is a viral infection affecting the nervous system. It can infect both the central and the peripheral nervous system, but the most common infection is in the anterior motor horn cells, resulting in flaccid paresis of muscles. Clinically this presents as scattered and variable weakness in skeletal and bulbar musculature. Residual impairment and paralysis ranges from minor muscle weakness to total paralysis requiring intervention such as ventilation.

After motor-neuron destruction during the acute polio infection, surviving adjacent motor units sprout terminals to reinnervate the denervated or orphaned muscle fibres. As a consequence, polio-affected muscles have a signature of oversized giant motor units and increased muscle-fibre density. A process of motor unit remodelling also occurs over the lifespan. It is thought that as polio-induced giant motor units 'drop out' or remodel, weakness can emerge or progress. Hence, people with LEoP may have experienced a prolonged period of stability (often decades) with their physical symptoms such as weakness and fatigue, before presenting to a primary care provider with what they feel is a resurgence of polio-like symptoms.

LEoP presents as a unique cluster of biomechanical and neurologic features - being variable for each individual - which can be moderated if properly assessed and managed. Late Effects of Polio include any of the following features.

Musculoskeletal features

- Decreased muscle endurance and muscle fatigue
- Overuse of compensatory muscle groups
- Muscle pain and/or spasms
- Joint pain and/or degeneration such as arthritis
- Biomechanical deformity such as kypho-scoliosis
- Muscle contracture or fibrosis
- Osteopenia or osteoporosis

Neurological features

- New or progressing muscle weakness
- Muscle atrophy
- Preservation of sensation irrespective of muscle loss
- Muscle twitching/fasciculation
- Compression neuropathy

Respiratory features

- Shortness of breath due to chest deformities
- Respiratory insufficiency due to sleep apnoea
- Weakening respiratory muscles
- Hypoventilation due to early damage to the respiratory control centre

Bulbar features

- Impaired thermoregulation
- Dysphagia/swallowing problems
- Dysphonia/vocal dysfunction
- Dysarthria/unclear speech
- Chronic fatigue, headaches, poor concentration

NOTE: Post-Polio Syndrome (PPS) is a specific diagnosis, determined by a neurologist or rehabilitation physician. It requires EMG testing, proven polio history, symptom and function change, and diagnoses exclusion.

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Late Effects of Polio: General Information

Additional considerations

- Biomechanical problems
- Bladder dysfunction
- Weight gain due to decreased mobility
- Oedema
- Psychosocial concerns due to increasing disability
- Pre and post-planning for surgical procedures

Comorbidities

- Cardiovascular disease
- Endocrine and metabolic diseases
- Chronic pulmonary disease
- Hip and limb fractures due to falls

LEoP Supporting factors

- Actual or suspected exposure to poliomyelitis
- A period of partial or complete functional recovery, followed by stable neurologic function
- Symptoms later emerge and persist for >1 year
- Exclusion of other diagnoses as problem sources
- Asymmetrical features, variable symptoms

Factors NOT supportive of the LEoP condition

- Resting tremor of limbs or head
- Worsening peripheral neuropathy
- Dizziness or vertigo
- Primary sensation alterations — proprioception, graphesthesia, stereognosis, vibration, localisation
- Problems with primary senses or their organs

LEoP Health Team

- General Practitioner
- Rehabilitation Specialist / Neurologist
- Physiotherapist / Exercise Physiologist
- Occupational Therapist
- Speech Pathologist
- Orthotist / Podiatrist / Pedorthist
- Respiratory / Sleep Specialist
- Dietitian / Nutritionist
- Osteopath / Massage Therapist
- Psychologist / Social Worker

More information

Polio Australia's www.poliohealth.org.au website contains resources for health professionals. It includes clinical practice publications, post-polio research papers, and the Health Professionals Register for referral or further consultation.

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