

Anaesthesia & Surgery

A guide for people
with a history of polio



ST VINCENT'S
HOSPITAL
MELBOURNE

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About this guide

People with a history of polio have special needs when it comes to anaesthesia and surgery.

This guide is for anyone who has had polio and will be having surgery. It has information to help you and your healthcare team plan your surgery. Take it with you to any appointments before you have surgery, and when you go into hospital.

The guide is divided into sections:

Talking to your healthcare team

This section has information for you as a patient. The most important thing you can do is tell the people on your healthcare team that you have had polio, even if you recovered many years ago. Please ask questions and talk to them about how polio has affected you. This section will help you do that. It includes information about:

- how polio affects your body and what that means for anaesthesia and surgery
- talking to your healthcare team before and after you have surgery
- leaving hospital after you have recovered.

Polio history form

Fill in the form as accurately as you can and take it to appointments and when you go to hospital. Your healthcare team may need more details but the form is a good place to start.

Leave the form in the booklet. Make photocopies if you can, or ask each person you have an appointment with to take a copy for themselves.

Information for your healthcare team

This section has specific information tailored for the people involved in your care. Your healthcare team may include:

- a surgeon
- an anaesthetist
- other specialist doctors, such as a neurologist, rehabilitation or respiratory consultant
- nurses, in the operating theatre, recovery room, and the ward.
- allied health staff including physiotherapists and occupational therapists
- your GP (general practitioner).

Talking to your healthcare team

Why it's important to tell your doctors that you had polio

If you have had polio, you have special needs when you have anaesthesia and surgery. This applies even if you fully recovered from polio and have not had symptoms since.

It is very important to tell your anaesthetist and surgeon that you have had polio and how it affected you when you first had the virus.

The way polio affects the body can increase the risks of anaesthetic. By talking to your doctors they can plan your surgery safely.

It is especially important to tell them if:

- you had breathing failure and needed to use an iron lung
- you have ever had problems with swallowing.

How polio affects the body

Polio can cause paralysis and muscle wasting in the limbs. It can also affect the brain stem and cranial nerves and cause breathing problems.

Brain stem

The brain stem helps control body functions that are not under conscious control (that is, part of the autonomic nervous system). For example, it is involved in regulating breathing, alertness, fatigue, and body temperature.

Cranial nerves

The cranial nerves also arise from the brain stem. Some of them are involved in swallowing, which is why some polio patients may have needed feeding tubes.

Post-Polio Syndrome and Late Effects of Polio

People who have had polio can experience effects later in life.

Late Effects of Polio (LEOP) relate to lifelong wear and tear on the body. LEOP can cause pain in the ligaments, joints, tendons, and muscles.

Post-Polio Syndrome (PPS) involves the rapid onset of a new weakness or increased fatigue.

Breathing

Polio can affect breathing in a number of different ways.

If you needed to use an iron lung when you had polio, you are at much higher risk of breathing problems later in life.

Problems like sleep apnoea, shortness of breath, or hypoventilation (under breathing) can be related to Post-Polio Syndrome, but they can also occur independently.

Spinal scoliosis (curvature of the spine) may cause or contribute to breathing problems.

Conditions related to polio can interact with other health issues, which increases the chance of breathing problems during and after surgery; for example, asthma.

Swallowing, speech, and reflux

Tell your doctors if you have any trouble with swallowing, speech, or reflux. They can increase your risk of having breathing problems after your surgery.

Talking to your healthcare team

Preparing for surgery

Your healthcare team want to give you the best and safest care they can. To do that they need to know as much about your medical history as possible. Everyone reacts differently to anaesthetic and surgery. It is important that your care is planned according to your individual needs.

In this section we describe the types of things to talk to your healthcare team about.

Before surgery

In many cases, you will see:

- your surgeon before you are admitted to hospital
- your anaesthetist after you are admitted to hospital, but before you have surgery.

Ask as many questions as you need to. We want you to understand what is involved in your surgery and what happens afterwards, including medication to manage pain.

Please tell your doctor if you are worried about having an anaesthetic or if you have existing breathing problems. They may make an appointment for you to see the anaesthetist before you come to hospital for surgery.

If you are worried about anything else, please talk to your healthcare team, they are there to help you. Please tell them if you are not satisfied with their answers to your questions. You can also seek a second opinion from another doctor at any time.

We have listed below some particular issues you should talk to your healthcare team about.

Your previous responses anaesthetic or pain medications

Some people who have had polio may be more sensitive to anaesthetics. This could be because of:

- damage to the central nervous system when you had polio
- a reduced number of functioning nerves supplying the muscles.

For this reason, care should be taken with the use of certain painkillers and sedatives. Once staff know you have had polio, they know how to monitor you to reduce the risk of complications.

Talking to your healthcare team

Your functional and physical status

Make sure you give your surgeon and anaesthetist an honest picture of what you can do (your abilities). The more they know, the better they can plan your surgery. Here are some examples of what to tell them:

- Movement: How well do you walk? Do you have problems getting into, or out of, a chair or bed? Do you use mobility aids like sticks, crutches, orthoses or callipers, wheelchair or scooter?
- Personal care: How much help do you need getting dressed, shaving, putting on make-up, or going to the toilet?
- Help at home: Will someone be at home to help you after surgery?

Highlight the presence of:

- Any joint contractures or spinal curvatures. This may affect how your surgery should be performed.
- Any respiratory problems, including shortness of breath, sleep apnoea, or use of equipment to help you breathe (CPAP, VPAP).

Also tell your doctors about:

- your past experiences with surgery, including any worries or fears
- all the medicines you are taking
- any allergies or bad reactions to drugs and medicines
- any dental prostheses you use, such as dentures, plates and caps
- the results of any previous lung function or respiratory tests.

After you have surgery

Managing your pain

Be honest with hospital staff about how much pain you feel after surgery. This will help them give you the right amount of medication to relieve your pain. This is important for two main reasons:

- if you are in pain it can make it harder for you to get moving after surgery.
- if you have too much or not enough pain medication it can affect your breathing.

Pain can sometimes make it harder for you to breathe deeply, cough, clear secretions, and move around. Patients with a history of swallowing problems may require assistance to clear secretions.

Your healthcare team wants you to be comfortable, safe, and to recover from your surgery. Talking to them openly about your pain will help them do that for you.

Mobility

You may be less coordinated after your surgery, which means you have a higher risk of falling. However, it is important to start moving as soon as it is safe to. Talk to the ward physiotherapist and occupational therapist about your usual abilities. They will help you get moving as quickly and safely as possible.

After surgery your muscles may tire more easily so you may not be able to perform some activities for as long as usual. Ask hospital staff for help with bed mobility, transferring, walking, and personal care tasks (such as showering and getting dressed).

Talking to your healthcare team

Temperature

It is usually quite cool in operating theatres and recovery rooms. Tell the nurses and staff in the recovery room if you need artificial heat to stay warm. Explain that adding more blankets, without providing an artificial heat source, may not be enough.

When you are on the ward, there may be rules about what kinds of additional heating can be used. Make sure that you packing warm pyjamas and clothes, and ask for extra blankets if you need them.

Take into hospital any aids or equipment you might need. For example, electric wheelchair, slide board, walking aids, orthoses, CPAP.

Going home

Post-operative function

Hospital staff will help you recover so you can safely go home. However, you may not be back to your usual level of ability. It is important to take this into account when planning for your return home. Here are a few things to think about or talk to hospital staff about:

- Do you need extra help with everyday tasks? Is there someone at home who can help? Can they manage the extra care you need?
- Will you need extra help with cleaning, shopping or accessing the community?
- What will your rehabilitation after hospital involve and how long is it expected to take?
- Will you be required to stop driving for a while after surgery? How long before you can start driving again?
- If you have surgery on an arm or a leg, how will this affect your mobility? You may not be allowed to put weight through your leg or arm, and surgery may affect your use of a stick or crutches.

Name: _____

Date of Birth: / /

Information about my Polio History

This form provides some information regarding how polio affected me in the acute stages and some information about how it affects me now - including my current abilities.

For further information about polio in general, please contact Polio Services Victoria on **03 9231 3900** or **1800 030 324** or **psv@svha.org.au**.



THEN	<i>Acute Phase</i>	I contracted polio when I was _____ years old. I was living in _____ (location) at the time. I was hospitalised / treated at home* for _____ weeks / months / years* I needed to be fed through a tube in the initial stages: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure I was on a ventilator (iron lung/tank): <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unsure Regions of my body that were affected during the acute phase of polio infection: <input type="checkbox"/> Right arm <input type="checkbox"/> Left arm <input type="checkbox"/> Right leg <input type="checkbox"/> Left leg <input type="checkbox"/> Trunk (spine or abdomen)		
	<i>Rehab</i>	I finished rehabilitation in _____ (year). After rehabilitation, I was still had weak muscles (or paralysis) in my: <input type="checkbox"/> Right arm <input type="checkbox"/> Left arm <input type="checkbox"/> Right leg <input type="checkbox"/> Left leg <input type="checkbox"/> Trunk (spine or abdomen)		
Today I have weakness in these areas of my body: <input type="checkbox"/> Right arm <input type="checkbox"/> Left arm <input type="checkbox"/> Right leg <input type="checkbox"/> Left leg <input type="checkbox"/> Trunk (spine or abdomen)				
At the moment I experience the following complications from polio: <input type="checkbox"/> Respiratory/breathing problems <input type="checkbox"/> Weakness <input type="checkbox"/> Pain <input type="checkbox"/> Cold intolerance <input type="checkbox"/> Swallowing difficulties <input type="checkbox"/> Fatigue <input type="checkbox"/> Sleeping issues <input type="checkbox"/> Urinary problems <input type="checkbox"/> Falls/near-misses <input type="checkbox"/> Sleep apnoea <input type="checkbox"/> Bowel problems				
I also struggle with these related issues: <input type="checkbox"/> Stress/hopefulness <input type="checkbox"/> Weight control <input type="checkbox"/> Exercise tolerance <input type="checkbox"/> Other:				
<input type="checkbox"/> I have required respiratory review in the past. My Respiratory specialist is: _____				
I use the following equipment / aids / orthoses: <input type="checkbox"/> CPAP machine <input type="checkbox"/> AFO (short calliper) <input type="checkbox"/> Walking stick <input type="checkbox"/> Manual wheelchair <input type="checkbox"/> BiPAP machine <input type="checkbox"/> KAFO (long calliper) <input type="checkbox"/> Crutches <input type="checkbox"/> Powered wheelchair <input type="checkbox"/> Hoist <input type="checkbox"/> Modified footwear <input type="checkbox"/> Frame/walker <input type="checkbox"/> Other: <input type="checkbox"/> Transfer board <input type="checkbox"/> Other orthosis/brace: _____				
I am able to walk _____ metres OR _____ minutes before needing to stop.				
NOW	My walking is limited by: <input type="checkbox"/> Weakness <input type="checkbox"/> Breathlessness <input type="checkbox"/> Other: <input type="checkbox"/> Fatigue <input type="checkbox"/> Pain			
	My ability to perform the following tasks / activities:			
	Independently capable	Supervision required	Assistance required	Equipment needed
Task:				
Transfer on/off bed	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Transfer on/off chair	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Transfer on/off toilet	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Showering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Dressing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Toileting	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Eating	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
I live in a: <input type="checkbox"/> House <input type="checkbox"/> Flat <input type="checkbox"/> Supported Accom. <input type="checkbox"/> Homeless <input type="checkbox"/> Unit <input type="checkbox"/> Public housing <input type="checkbox"/> Aged care facility <input type="checkbox"/> Rooming house				
I live with: <input type="checkbox"/> Family <input type="checkbox"/> Others <input type="checkbox"/> Alone				
I receive support at home with: <input type="checkbox"/> Personal care <input type="checkbox"/> Cleaning <input type="checkbox"/> Other: _____				
There are _____ steps at home. <input type="checkbox"/> Rails located at the steps <input type="checkbox"/> Ramp access available				
I have had the following modifications performed to my home environment: _____				

Information for your healthcare team

For surgeons and physicians

The following points may assist in making decisions with the polio patient who is to undergo surgery.

Pre-operative assessments

- Unless it is a minor procedure, polio survivors are generally not suitable for day surgery or fast track care pathways.
- Take a detailed history to establish all regions affected by the acute polio infection, specifically asking about respiratory failure, use of an iron lung and bulbar dysfunction. Polio-related nerve damage is frequently underestimated by clinicians and patients alike.
- Consider the need for neurophysiological testing in complex cases.
- A thorough respiratory evaluation may be required along with the appropriate baseline respiratory function tests.
- Identify any joint contractures or spinal deformities that may impact on intra-operative positioning. The literature reports some risk of nerve damage from traction.
- Where practicable, use muscle-sparing approaches to orthopaedic surgery.
- If new orthoses or alterations to existing orthoses are required post-operatively, a consultation with their regular orthotist is advised before surgery.
- Many polio survivors will have a highly compensated musculoskeletal system, which relies on substituting the actions of paretic muscles with others that are less affected. This compensation requires a higher level of alertness to produce functional movement. Consider a pre-operative allied health assessment (occupational therapy, physiotherapy) to help establish a realistic post-operative pathway by identifying:

- functional abilities and the need for physical assistance.
- the potential impact of surgery on your patient's ability to mobilise post-operatively.

Post-operative

There are some increased post-operative risks in this group, including:

- Increased aspiration risk due to:
 - previous bulbar impairment and subsequent oropharyngeal paresis (diagnosed or undiagnosed).
 - reflux.
- Anti-emetic prescription may be advisable for the post-operative period.
- There is a possible increased risk of urinary retention and paralytic ileus due to possible autonomic dysfunction.
- Consider benefit versus risk when using opioid analgesia, as they may cause excessive sedation in this group as well as clinically significant respiratory depression. Opt for NSAIDs and local anaesthesia for pain relief if practicable.
- Those who have had polio are generally slower to rouse post-operatively.
- In the event of blood loss, the threshold for replacement should be lower.
- Blood volume in paretic limbs may be lower and likely to be reflected by the amount of muscle present. There may also be altered vasoconstrictive reflexes.
- This group will take longer than normal to regain their usual level of functioning, especially their ability to mobilise. Consider prolonging prophylactic anticoagulation treatments to account for this.
- If immobility appears to be prolonged, consider pressure ulcer risk.

Information for your healthcare team

For anaesthetists

The following points may assist decision making with the polio patient who is having surgery:

Pre-operative considerations

A thorough history taken pre-operatively may help determine anaesthetic risk and the need for respiratory function tests. This should include questions relating to:

- Cranial nerve (CN) involvement – ‘bulbar polio’. Paresis due to polio related CN may not be florid at presentation. Swallowing dysfunctions may occur with general fatigue, or at the end of the day due to problems with muscle endurance. Persistent or episodic weakening of the voice may indicate the need for a laryngoscopy to evaluate plicae vocalis if recurrent laryngeal nerve paresis is suspected.
- The previous and current use of ventilator assistance.
- The potential for sleep disordered breathing/ sleep apnoea problems.
- The potential for alveolar hypoventilation due to paresis or compromised muscular endurance of the diaphragm and accessory muscles of respiration, or spinal and thoracic deformities.

Some polio survivors may have reticular activating system lesions, which may lead to altered reactions to anaesthetic induction agents. Consider restricting doses of pre-operative medications, and be aware that emergence is likely to be slow.

Perioperative considerations

Consider the positioning of the patient to account for musculoskeletal deformities.

- Positioning the patient while awake may be advisable. Increasing comfort perioperatively may reduce the risk of pain other than at the incision site (persistent pain resulting from a highly compensated musculoskeletal system is common).
- There have been some reports of perioperative nerve traction and entrapment injuries in this population.
- Neck scoliosis may require fiberscope at intubation.
- Carefully titrate anaesthetic dose for effect, favouring short acting agents.
- It may be advisable to commence with 50% of the normal dose of anaesthesia; less if extensive nerve damage has been confirmed with neurophysiological studies.

If considering regional anaesthesia:

- The concentration at which intrathecal anaesthetic agents are toxic may be theoretically lower in this population.
- Prior to administering neuromuscular blockades, obtaining a baseline twitch response is advisable (as this may be abnormally reduced).

Information for your healthcare team

For the recovery room

- Emergence from anaesthesia may be significantly prolonged. Monitor vital signs carefully – patients will need to be observed in recovery for longer than usual.
- Blankets and warming devices are advisable if the patient has cold intolerance, to protect against cooling.
- Post operative respiratory treatment may be needed:
 - Increased aspiration risk, particularly in those with a history of bulbar polio. Consider anti-emetic prescription post-operatively.
 - Upper airway obstruction may occur if there is unrecognised paresis of oropharynx or recurrent laryngeal nerve.
 - Poor respiratory muscle strength will affect cough effectiveness.
- Minimise opioids and consider NSAIDs and local anaesthesia for pain relief if possible.
- There is an increased risk of postoperative urinary retention. There is an increased risk that post-operative ventilator support will be required in this group
- Contingency planning for management of respiratory distress and early consultation with ICU physicians is advisable if respiratory problems are noted or there is a history of respiratory failure at the time of the acute polio infection.

For ward staff

- There will be a need to monitor respiratory function as there is potential for an increased aspiration risk and an ineffective cough.
- There may be increased post-operative risk of both urinary retention and paralytic ileus due to possible autonomic nervous system dysfunction.
- Protection against cooling may need to continue should the patient experience cold intolerance.
- The threshold for considering transfusion post operatively should be lowered.
- Prophylactic anticoagulation treatments should be lengthened to account for the lengthened period of immobilisation.
- Pain treatment should be multimodal with the respiratory effect of opioids carefully considered.
- Mobility will be decreased due to:
 - the need to regain compensatory movement strategies postoperatively
 - the prolonged effects of sedative and anaesthetic agents
 - patients will need to be fully alert before they attempt to mobilise – consider falls risks
 - patients may also need more assistance to move in bed, in and out of bed and around the ward.
- There is likely to be a prolonged return of their previous level of functioning. Few individuals with polio will suit a ‘fast track’ rehabilitation pathway – a collaborative multidisciplinary approach is usually more successful.

Information for your healthcare team

For rehabilitation staff

- Most people with polio have functioned for many years with highly compensated neuromusculoskeletal systems.
- Consider that movement strategies may be difficult for the individual to change.
- Monitor for signs of fatigue during rehabilitation activities.
- Be prepared to re-evaluate the effectiveness of treatment more frequently.
- Compensation may need to be favoured over restoration.
- Respect reports of muscular fatigue, as there is a risk of overloading already weakened muscles, which may promote further degeneration.
- Training should target:
 - cardiovascular deconditioning with low-intensity aerobic exercise
 - flexibility, especially where a risk of contracture has been identified
 - endurance strengthening with sub-maximal (non-fatiguing) resistance exercise.

References & Links

References

Bruno RL, Cohen JM, Galski T, Frick NM. (1994). The neuroanatomy of post-polio fatigue. Arch Phys Med Rehabil.;75(5):498-504.

Bruno RL, Johnson JC, Berman WS.(1985). Vaso-motor abnormalities as post-polio sequelae: functional and clinical implications. Orthopedis.,8(7):865-9.

Tsai HC, Hung TH, Chen CC, Lieu FK, Cho H, Tung TH, Chen SF.(209 Prevalence and risk factors for upper extremity entrapment neuropathies in polio survivors. J Rehabil Med.;41(1):26-31.

Gawne AC, Wells KR,Wilson KS.(2003). Cardiac risk factors in polio survivors. Arch Phys Med Rehabil. 84(5):694-6.

Gyermek L. Increased potency of nondepolarizing relaxants after poliomyelitis.. (1990) J Clin Pharmacol.;30(2)170-3.

Kay L. (2011). Voiding and Bowel Problems (Abstract) from Post Polio Syndrome – a Challenge of today; European Conference. J Rehabil Med;Suppl 49:1-64.

Macario A, Mackey S, Terris D. (1997). Bilateral vocal cord paralysis after radical cystectomy in a patient with a history of bulbar polio. Anesth Analg.;85(5):1171-2

Mohammad AF, Khan KA, Galvin L, Hadiman O, O'Connell PG.(2009) High incidence of osteoporosis and fractures in an aging post-polio population. Eur Neurol.;62(6):369-74.

Lambert DA, Giannouli E, Schmidt BJ.(2005). Postpolio syndrome and anaesthesia.. Anesthesiology.103(3):638-44.

Robinson LR, Hillel AD, Waugh PF.(1998). New laryngeal muscle weakness in post-polio syndrome. Laryngoscope. 108(5):732-4.

Useful links

Polio Australia

PO Box 500
Kew East VIC 3102

Tel: 03 9016 7678

Email: office@polioaustralia.org.au

Web: www.polioaustralia.org.au

Polio Network Victoria

A service of Independence Australia, which coordinates Victoria-wide polio support groups

Building 1, 9 Ashley Street
West Footscray VIC 3012

Local call: 1300 704 456

Email: polio@independenceaustralia.com

Web: www.polionetworkvic.asn.au

Post-Polio Health International

4207 Lindell Boulevard #110
Saint Louis, Missouri
63108-2930 USA

Tel: +1314-534-0475

Email: info@post-polio.org

Web: www.post-polio.org

About Polio Services Victoria

Polio Services Victoria is a multidisciplinary team comprising a rehabilitation medicine physician, a physiotherapist, an occupational therapist, an orthotist and a social worker. We provide a specialist assessment and referral service, with limited capacity for direct treatment/therapy.

Multidisciplinary clinics at St Vincent's Hospital and in regional Victorian hospitals require a medical referral. Allied health consultations are available (no medical referral is required).

For more information contact:

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