



EUROPEAN INSTITUTE
WARSAW POLAND



Single-event multilevel
surgery (SEMLS) at
Paley European Institute

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Brief introduction

Cerebral palsy is a type of physical disability that affects mobility and body posture. The chronic symptom cluster associated with movement disorders can be classified from mild to severe. CP may have a different form in each person affected, so each Patient with cerebral palsy is unique.

The topic of cerebral palsy is associated with a bewildering number of medical and technical terms. We have created this guide for you to structure and organize knowledge in a straightforward manner. It contains information which should be read before, during and after the stay at Paley European Institute. At the end of the guide, you can find a glossary of terms you will encounter during the entire treatment process, as well as frequently asked questions.

A diagnosis of cerebral palsy, spina bifida or another neurological disease that affects the brain or spinal cord can be associated with pain and/or difficulties with walking. The lack of appropriate treatment can lead to painful degenerative lesions in the joints. Following a thorough clinical examination and an analysis of additional tests and examinations, the PEI physician will develop a surgical treatment plan aimed at reducing the risk of pain, slowing down the deterioration in function at later stages of life and enabling optimal physiotherapeutic management.

Lower limb surgeries performed at our Institute are called single-event multilevel surgeries (SEMLS) because as many of the existing bone deformities and soft tissue problems as possible are corrected during a single surgery. This also results in a shorter duration of physical therapy and a single recovery period. A multilevel surgery can also reduce the risk of recurrence of the problem. Moreover, surgical treatment can help walk more effectively, it can also improve or maintain the ability to move joints and prevent problems resulting from abnormal muscle and bone alignment.

Please note that these instructions contain general guidance only. Before surgery, a physician, physiotherapist and a medical care coordinator will discuss all the necessary information with you. Our team is always available and will be happy to help resolve any doubts.

BEFORE THE HOSPITAL STAY

Motion analysis

Modern treatment planning, evaluation and monitoring in people with cerebral palsy should all be based on advanced diagnostics. Therefore, a comprehensive motion analysis is an essential part of therapeutic management at Paley European Institute. It provides the data to allow a precise determination of the causes of motor deficits, distinguishing between primary abnormalities and compensation mechanisms, as well as gait pattern identification. The information collected constitutes a basis for all further medical actions – physical therapy, potential surgical interventions or orthopedic equipment fitting.

Conducting a motion analysis allows the following:

- precise determination of motion patterns and abnormalities,
- changes in motion pattern over time,
- prevention of dysfunction progression,
- selection of the optimal therapeutic solutions (physical, therapy, surgical interventions, orthopedic equipment),
- evaluation of orthopedic equipment performance (orthoses, suits, etc.),
- identification of overactive muscle groups and assessment of treatment effects before and after BTX-A injections,
- improvement in overall functioning
- development of rehabilitation programs tailored to the Patient's individual needs.



At Paley European Institute, we recommend that Patients with motor problems undergo a motion analysis once per year. In the case of elective surgery, we perform this examination as part of a preoperative consultation (at least one month before the scheduled surgery) and 6 or 12 months after the surgical intervention, depending on the procedure type. A reliable assessment of the treatment progress is only possible with precise preoperative examinations. In the case of BTX-A injections, it is recommended to perform the analysis one month before and approximately 3 months after the procedure. Additionally, it is recommended to perform the analysis when preparing orthoses, which allows obtaining the best possible therapeutic outcomes. An orthotist will decide whether performing the analysis is indicated before orthoses are manufactured or when they are being tuned, i.e. fitted to the child's gait parameters.

The examination can be performed only if the child is able to walk independently or with hand-held walking aids such as a walking frame, walker, crutches, quad cane, etc. The analysis can be performed with orthopedic equipment (orthoses, suits).

The facility recommended by Paley European Institute to perform this examination is the OPSA Motion Diagnostics Center where motion analysis is done using the most technologically advanced equipment in Poland – a multiplanar marker gait analysis.

This includes:

- 12 cameras that record the Patient's body from multiple directions, which allows capturing motion in all planes,
- dynamometric platform that records the forces acting upon the body,
- electromyography (EMG) electrodes that record muscle activity.

This enables a measurement of spatiotemporal parameters (step length, width, speed) and joint strength, and an assessment of how the muscles work and what force they generate, including:

- range and course of each joint movement,
- ground reaction force and forces transferred by the body and joints,
- muscle or muscle group activity.

How to prepare for motion analysis?

- Wear simple clothes which do not restrict movement, preferably shorts



(boxer briefs) and a tank top to expose the areas where markers or electrodes will be attached.

- The skin should be clean, with no lotion or cream applied.
- Bring the orthopedic equipment used by your child (orthoses, suits, walking frames, crutches, etc.) with you.
- It is a good idea to explain to the child what the analysis will look like and what will happen to minimize stress.

What does the motion analysis involve?

- The Patient will be asked to undress (leaving only shorts and a top, however, sometimes it is necessary to perform the analysis with only pants on); then markers (small devices to capture the motion of individual body segments) will be attached to their body. Subse-

quently, the Patient will be asked to walk along a designated path several times.

- If an electromyography (EMG) examination is performed, special electrodes will be attached to the Patient's body to analyze muscle activity during walking; the Patient will then be asked to repeat the walk several times.
- The child must not hold the parent's/caregiver's hand, but the parent/caregiver may walk alongside.
- It is a good idea to bring the child's favorite toy to the analysis, especially in the case of toddlers.

The examination takes approximately 60 minutes (depending on the number of required parameters and the child's cooperation). Following the motion analysis, the Patient receives a data report which is then interpreted by our specialists, and the collected data is used to plan the individual therapeutic management, to evaluate and monitor treatment or to fit appropriate orthopedic equipment.

Preoperative visits

After the first visit at Paley European Institute, the Patient receives a surgical treatment plan (referred to as a surgical life plan) in the form of a report which contains information (special guidelines) on what treatment will look like and what the Patients and their relatives can expect at each stage. The report is drafted by a multidisciplinary team which includes physicians, physiotherapists, medical care coordinators, as well as orthotists, a psychologist and a dietitian. After you receive the treatment plan and cost estimate, contact your foundation or insurer. You should learn which documents will be required to start fundraising and to pay for the procedure (invoice guidelines).

Preoperative visit list:

1. Consultation with an orthopedist
2. Consultation with a physiotherapist
3. Consultation with an anaesthesiologist
4. Consultation with a psychologist

Each of the above consultations must be conducted in-person no later than one month before the scheduled procedure date.



Consultation with an orthopedist

An appointment with an orthopedist before the procedure takes place at Paley European Institute. Upon arrival, please report to the reception desk to confirm your arrival. Afterwards, a PEI employee will walk the Patient and his or her carer to the consultation office. During the visit, it may be necessary to perform an additional X-ray; the Patient will be invited to return to the consultation office afterwards. During the appointment, the physician and other team members remain at your disposal and will be happy to answer any questions and address any concerns regarding treatment.

What to bring with you to the consultation with a physician?

- Medical records and results of additional tests and examinations.
- X-rays and other scans: computed tomography (CT), magnetic resonance imaging (MRI).

You should ask the following questions during the consultations:

- What will the entire treatment process look like?
- Is it necessary to take any medications before the procedure? If yes - which ones?
- How long will the procedure itself last?
- Will casts, abduction splints or other immobilization be used after the procedure?
- Will physical therapy be required? When will it start and how long will it last?
- When will a return to school/work be possible?
- When to schedule the postoperative follow-up visit?



Consultation with a physiotherapist

The aim of the consultation with a physiotherapist is to fit orthotic equipment used after the surgery and to discuss the physical therapy plan (days and times). You should ask the physiotherapist about the equipment necessary during treatment (which will be provided by PEI).



Consultation with an anaesthesiologist

Before the visit, the examinations from the list previously sent by a medical care coordinator should be performed. During the consultation, the physician will ask for test/examination results and collect information about all of the Patient's medical conditions, about previous surgeries, implants and medications, so it is a good idea to prepare all of this information prior to the visit. If the Patient is under the continuous care of another specialist (cardiologist, neurologist, neurosurgeon or other), a certificate issued by this specialist will be required to confirm there are no contraindications to the procedure.

Consultation with a psychologist

The treatment offer at Paley European Institute includes psychologist consultations to help you prepare for the procedure and further treatment.

What to take care of when planning a hospital stay?

- ☐ Book accommodation for the duration of your stay (ideally close to the hospital)
- ☐ Prepare an identity document
- ☐ Arrange transportation, taking into account physical limitations after surgery (wheelchair, special car seat) - it is a good idea to ask the PEI medical care coordinator for support with this matter
- ☐ Consider whether a ZUS ZLA (medical certificate confirming inability to work) or sick child leave is needed - if yes, report this need to your coordinator before arrival
- ☐ Prepare for the potential need of additional care after the procedure (e.g. Assistance of a caregiver, nurse)
- ☐ Bring all test/examination results and medications with you
- ☐ Determine a follow-up visit schedule
- ☐ Pack personal items that will make your stay more comfortable: slippers, robe, pajamas, blanket, comb, towel, favourite toy, phone charger

Schedule an appointment with your primary care physician (family doctor) to check your health and exclude any contraindications to the procedure one week before the scheduled procedure.

Contact your medical care coordinator as soon as possible in the event of a common cold, cough, sore throat, fever or exposure to chickenpox, measles, COVID-19 or other infections.

HOSPITAL STAY

Hospital admission usually takes place 1 day before the scheduled procedure date. In justified cases and with the physician's and anesthesiologist's permission, this can be done on the day of the procedure. The PEI medical care coordinator will help you complete the hospital formalities and take you to the department.

At the department, the Patient and their caregiver will be accommodated in a single- or double-family room, according to the assigned privileges. This is the place where the Patient's caregiver overnights throughout the hospital stay. Meals are delivered to this room as well (regardless of which room the child stays in after the procedure). These may only be consumed in this room.



Once accommodated in the room, the Patient is visited by a pediatrician who assesses their health and orders the required tests/examinations in the system. Then a nurse takes the Patient to the procedure room for a blood collection. If there are no contraindications, this will end with an insertion of a venous catheter which is required for surgery. It is important that the Patient has a test result or a document to confirm their blood type. An anesthesiologist may also come to the department, especially if the Patient was seen previously only via

telemedicine visits. A PEI orthopedist will also come before the procedure. At the department, the child may also be visited by a PEI animator and a psychologist who will be happy play with them to relieve stress.

Before surgery

It is important to follow the physician's instructions:

! Do not eat for 6 hours (a piece of bread, sweets, milk, gruel or a chewing gum are considered meals!).

! Do not drink 4 hours (including water).

Failure to follow the above instructions will result in the procedure being delayed by an additional 6 or 4 hours and may implicate extra charges for the hospital stay.

The purpose of premedication, i.e. pharmacological preparation for surgery, is to calm the Patient down before the procedure. It improves wellbeing, reduces nervous tension and pain, and facilitates anesthesia and reduces the amount of analgesics required. It is performed approximately 30–40 minutes before the scheduled procedure time. Medication administration is up to the anesthesiologist's individual decisions. This causes a sense of relaxation and partial or complete loss of consciousness in the child. In this state, the child is transferred to the operating suite. In specific situations, the physician may decide not to administer premedication. The parent may accompany the child at this time. When they arrive, the parent decides whether to follow the child further. If they decide to enter the operating room, they will be asked to change into specially prepared protective clothing.

Having changed clothes, the parent joins the child who receives an anesthetic. The child may be accompanied until they fall asleep. Then the personnel will ask you to leave the room. An anesthesiologist may ask the parent to leave the room earlier for medical reasons. The parent leaving the room does not mean that surgery starts immediately. All parameters and vital functions are stabilized under the supervision of an anesthesiologist to ensure the procedure can be performed safely. After their separation from the child, the parent will receive notifications on the progress of surgery via WhatsApp. When possible, our team will inform you about the subsequent stages of surgery; however, due to its course this cannot be done too frequently. You can expect 2–3 messages throughout surgery. Once the procedure ends, you will also be informed via the application or personally by the medical team.

Timing and duration of the procedure

The physician has certainly informed you about the expected timing and duration of the procedure. However, the situation at the operating suite can change – both for your child and for a previously operated child. A shorter or longer procedure duration does not necessarily mean complications, failure or negative consequences. Please do not panic. It is possible that the duration of surgery will be reduced or significantly extended for medical reasons, which will affect the surgi-

cal schedule and your child will be transferred to the operating suite earlier or later than scheduled. Such information will also be provided via the application or personally by the PEI team. Please remember that in exceptional situations, a Patient requiring an immediate surgical intervention to save their life may arrive at the operating suite, making delays and rearrangements in the surgical schedule inevitable. We cannot control unexpected situations.

Return to the recovery room

When the surgery is completed and the Patient safely wakes up, the parent receives information that they may see their child again. Until the anesthesiologist decides that the Patient can be safely transported to the department, the Patient remains at the recovery room near the operating suite. Typically, this can last between 1 and 2 hours. In individual cases this may take a little longer. You can stay with your child in this room until 10:00 PM. Please remember that for 24 hours after the procedure the patient remains under the supervision of an anesthesiologist who makes all the decisions, especially those related to analgesic treatment.

Intensive medical supervision room

After surgery, the anesthesiologist decides that the Patient can be safely transported to the department. The Patient initially stays at the intensive medical supervision room. This is the room closest to the nursing station where the patient is constantly monitored. The parent may stay with their child 24 hours a day in this room, but eating or sleeping at the child's bed is not allowed. Although recliner chairs are available in this room, reclining is strictly prohibited due to the specific character of the room. It would make it difficult for the medical personnel who constantly monitor Patient's safety to access to the bed and the connected instruments. In this room, the child is only allowed to drink and personal hygiene can only be maintained using wet wipes.

Patients are visited by a PEI orthopedist during the evening round. During the entire stay at the department, pediatricians and a PEI physician on duty are present at the department and are responsible for Patient care; they will be happy to answer any questions.

General Patient room

Upon the decision of the treating anesthesiologist, the Patient is transferred to the general room where you were accommodated on the day of admission to the department. Bedside physical therapy, which is carried out by PEI's team of physiotherapists, is also initiated in this room. It involves, among other things, learning how to change position, introducing some movement to counteract post-operative stiffness or pressure ulcer formation. If possible, a physiotherapist provides support in verticalization and learning to perform everyday activities. The date and process of physical therapy after discharge is established individually and depends on the course of surgical treatment. During your stay in this room, you will also be visited by physicians during their everyday rounds, PEI medical care coordinators and a psychologist.



Discharge

The decision about discharge is made by the PEI treating physician and it is formally managed by the orthopedist on duty at the department on that day.

Upon discharge, you will receive information regarding:

- first follow-up visit,
- required prescriptions,
- physician's recommendations,
- nursing recommendations concerning care at home, among other things.

Please remember to collect your test/examination results upon discharge.

Settlement and invoices

You will receive the final invoice for surgical treatment at Paley European Institute as soon as possible after leaving the hospital. Regarding this matter, please contact us by e-mail at: finanse@paleyeurope.com.



CARE AFTER HOSPITAL STAY

Pain management

The first step in dealing with postoperative pain is pharmacological treatment. Medications are administered in formulations and at doses which allow minimizing the sensations. Strict cooperation between parents, physicians and nursing staff, and later with physiotherapists as well, is an important aspect. If the child's pain is reported quickly, adequate action can be taken to prevent it from becoming too severe.

Sometimes children react to pain differently than adults.

Children may:

- cry or scream,
- complain of pain,
- be irritated or have a negative attitude,
- have difficulties with calming down or diverting their attention,
- show a substantial change in behavior (for example, an active child may become quiet or withdrawn),
- sleep fitfully or be unable to fall asleep,
- eat or drink very little
- show changes in muscle tension (unusual tension, spasticity, muscle spasms),
- be unable to find a comfortable position,
- remain still, as if to avoid touch or movement,
- avoid playing or their favourite activities.

What can be helpful in relieving your child's pain?

- ☐ Proximity of a parent/caregiver.
- ☐ Physical touch - hugging, stroking, holding hands, rocking, massaging.
- ☐ Accepting the child's emotions without negating them.
- ☐ Diverting attention - e.g. by talking about pleasant things and asking the child about various aspects (e.g., interests, best holiday memories).
- ☐ Giving the child a choice and control when possible - let them choose what they want to eat, wear, how they want to play with, which jigsaw they want to do.

- ❑ Breathing techniques.
- ❑ Relaxation and guided imagery techniques.
- ❑ Getting any equipment associated with pain (e.g. needles, syringes) out of the child's sight. If possible and helpful, also getting them out of the parent's sight.

It is possible that just medications will be enough and nothing else needs to be done. However, it is a good idea to learn and implement other ways to manage pain, so we encourage you to read "How to deal with you child's pain," a guide which describes supporting psychological strategies along with sample exercises and activities to help alleviate pain.

Pharmacological treatment

Depending on the Patient's pain tolerance and the type of surgery performed, it will probably be necessary to receive analgesics for a prolonged period of time. Analgesics work best when taken regularly. When the pain becomes severe, it can be difficult to regain control over it.

Pain can increase when sleeping so it is a good idea to get up at night and take medications as planned instead of waiting for the pain to wake you up. For slight pain it is recommended to take a mild analgesic, such as paracetamol. Some people need stronger medications, such as tramadol or oxycodone. Sometimes it is necessary to take oral relaxants, such as baclofen, or adjust the intrathecal baclofen dose on a pump. We may also suggest using diazepam (Valium) in order to reduce muscle spasms in the first days after surgery.

Before leaving the hospital, you will be informed which medications should not be combined with analgesics. You should discuss all pharmacological agents received with the treating physician. As many over-the-counter medications contain paracetamol, you should always carefully read the leaflets in order not to use too



much of it. It is recommended to limit the number of doses over 24 hours and take them only with a physician's approval.

When the pain becomes less severe, strong analgesics should be gradually replaced with mild ones. One way is to use ordinary paracetamol during the day. If this is enough, continue using it. If the discomfort increases, especially at night, it is recommended to resume taking a stronger analgesic. The pain should gradually decrease with each day after the surgery, up to a point when even ordinary paracetamol can be discontinued.

Muscle spasms can often occur after surgery. Cold (ice) or hot compresses, changing position, passive motion and gentle massage can provide relief. As long as the spasms are mild and subside, it is not necessary to contact Paley European Institute, but if they worsen, contact your medical care coordinator immediately.

Swelling, movement, irritation, infection and light sleep can increase pain. Leg and back pain can occur during recovery. If the pain increases, you should check if the amount of physical activity is adequate. Physical therapy should be planned so that the Patient can take an analgesic one hour before the exercises. It is better to take analgesics and be active than to limit activity in order to avoid pain.

If the pain is worse than usual, the Patient should:

- take another analgesic dose if enough time has passed since the previous dose; the never take more medications than prescribed by the physician;
- try stronger analgesics (instead of milder medications, not additionally) if they were prescribed by your physician; if analgesics are not effective, contact a physician or the PEI medical care coordinator immediately.

Postoperative wound care

For the period recommended by the physician, you should avoid soaking the wounds, immersing them in the bathtub, swimming pool, jacuzzi, hydro massage bathtub or lake. If water gets into postoperative wounds, an infection may develop. You will be allowed to take a shower only when the cast is removed (three to six weeks after surgery). If no cast is applied, you will be allowed to take a bath at least 14 days after surgery (when the postoperative wounds are healed).

Most wounds are closed using absorbable sutures which gradually dissolve in the body and do not need to be removed. Your wounds will be covered with a transparent dressing which will be removed after 10–14 days.

In some cases, a very effective, cutting-edge vacuum wound therapy (VAC) is used at PEI. A VAC therapy dressing is applied for approximately 10 days in the postoperative period to accelerate wound healing, reduce the risk of infection and improve scar appearance.

Infection

If postoperative wounds are visible, they should be inspected every day for signs of infection. The wounds can appear pink when healing but should not be inflamed or have an intense red color. The symptoms of infection include:

- warmth, redness, wet exudate or swelling at the postoperative wound site,
- fever above 39,0°C,
- sensitive, enlarged lymph nodes in the armpit or groin closest to the wound,
- increasing pain.

If postoperative wounds are covered with a cast or dressing, pay attention to any discharge (such as pus or new leakage from under the cast or soaked dressing). Never wet the cast. Continue washing with a sponge until the cast is removed.

Minimizing scars

Scars usually remain protruding, red and hard for eight weeks. After one year, they become softer, whiter and flatter. In order to reduce the scars, you should not expose postoperative wounds to sunlight for at least one year. It is recommended to use a sunscreen cream in order to prevent wound darkening.

You should talk to the physiotherapist about scar therapy options, the use of brightening and smoothing creams, as well as self-therapy.

Approximately nine months are needed to see what the scar finally looks like. Then, depending on scar severity, the physician may consider the options for scar removal. The techniques used to remove a scar or improve its appearance include laser treatment, dermabrasion and surgical revision.

Diet

A proper diet supports faster wound healing, speeds up bone union and helps to minimize problems such as constipation and other gastrointestinal complaints which sometimes develop after surgery. Helpful actions include regular consumption of high-fiber products. To avoid bloating, it is good to gradually increase the amount of fiber in your diet.

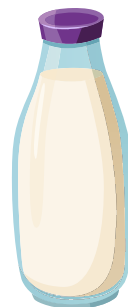
You can also introduce various supplements after a consultation with a PEI physician or dietitian.

After surgery it is extremely important to provide an adequate amount of nutrients which significantly affect recovery, convalescence and bone formation. These include: calcium, phosphorus, magnesium, vitamin D, protein, vitamin C, vitamin K, silicon, zinc and copper.



Calcium

This is the most important building block of the bones. Calcium is important not only in the period of building the highest bone mass but also in periods of increased requirement during recovery after an osteotomy or bone fracture. The best and most easily absorbed dietary sources of calcium are dairy products: milk, kefir, buttermilk, natural yoghurts, as well as rennet cheese (e.g.parmesan, gouda) and quark. Vegetables



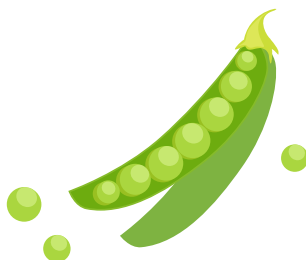
from the cabbage family, broccoli, legumes, nuts, sesame or poppy seeds are rich in calcium too.

Phosphorus

An important component of the bone tissue. Together with calcium, it mineralizes bones and teeth. Its adequate blood concentrations help to maintain normal levels of parathyroid hormone and vitamin D. Fish, meat and meat products, cereal products, milk and dairy products, nuts and legume seeds are a good source of phosphorus. Products rich in calcium also provide large quantities of phosphorus.

Magnesium

Magnesium plays an important role in bone metabolism and calcium balance; it is also involved in immunological processes. Magnesium alleviates inflammations and infections. It has antispastic and anticonvulsant effects. The dietary sources of magnesium include legume seeds, cereal products, nuts, cocoa, dark chocolate, fish, rennet cheese and potatoes. Magnesium is also provided with drinking or mineral water.



Vitamin D

Vitamin D regulates the calcium-phosphate balance and affects bone mineralization. It supports muscle function and the immune system. Patients recovering from surgical treatment have a higher requirement for vitamin D. The primary source of vitamin D is synthesis in the skin as a result of exposure to ultraviolet radiation. Other sources of vitamin D include oily fish, such as mackerel, salmon and herring, fish oil, as well as butter, margarine, egg yolk and liver.

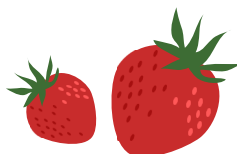
Protein

An organic component which supports the processes of bone formation, tissue regeneration and recovery after surgery. Proteins are made up of amino acids. Certain amino acids cannot be synthesized by the body, so they must be provided with food in appropriate amounts. Protein malnutrition disturbs the synthesis of collagen, cellular matrix proteins and muscle proteins. By decreasing tissue regeneration capability, it extends healing time, increases the risk of infection and reduces the immune system's ability to adequately respond to pathogens. Excessive

protein consumption has a significant impact on kidney function by increasing the risk of nephrolithiasis and on calcium balance by increasing the urinary calcium excretion. Meat, dairy, legumes are good sources of protein.

Vitamin C

Vitamin C exerts a strong anti-oxidative effect by eliminating free radicals, it is involved in the synthesis of collagen required for normal connective tissue and bone structure. It enhances iron and calcium absorption. Vitamin C also has a positive effect on mental health. Its deficiency can lead to a reduced resistance to infections. By impairing collagen synthesis, vitamin C deficiency impairs wound and bone healing and tissue regeneration. Major sources of vitamin C include fruit and vegetables, such as blackcurrant, kiwi fruit, strawberries, bell pepper or citrus fruits.



Vitamin K

A fat-soluble substance. It participates in the processes of blood coagulation, as well as bone-forming and calcium-binding proteins. Vitamin K also has analgesic, antifungal, anti-inflammatory, and antibacterial properties, particularly useful in perioperative and reconstructive surgery. Deficiency of this vitamin can result in decreased blood coagulation, increased risk of external and internal bleeding, as well as difficulties with bone mineralization or poor wound healing. The main sources of vitamin K are green vegetables, such as beet leaves, spinach, Brussels sprouts, broccoli, cabbage, nuts, and oils.



Silicon

It builds soft tissues and collagen. It is responsible for adequate elasticity and flexibility of blood vessel walls, components of the osteoarticular system or tendons. The requirement for silicon increases following surgery and bone injuries. Silicon supplementation is recommended to speed up bone growth. The main sources of silicon are cereal products with husks: oat, rice or wheat bran, brown rice or oats, as well as herbs: field horsetail, coltsfoot, stinging nettle.

Zinc

It is responsible for skin condition. A decrease in its concentration causes impaired wound healing. Low levels of zinc result in immunodeficiency, increased risk of perioperative infections and impaired healing. The following products are rich in zinc: liver, meat, rennet cheese, buckwheat groats, eggs, wholegrain bread.



Copper

It is involved in the transport of oxygen to every cell in the body. It is responsible for the normal functioning of thought processes, such as the ability to assess a situation, creativity, memorizing. It also shows a protective effect against free radicals and has a bacteriostatic effect. Nuts, cocoa, liver, sunflower seeds or cereal products, e.g. wheat germs, are good dietary sources of copper.

After surgery, the most important aspect is to restore intestinal motility and regulate bowel movements. This may take variable amounts of time, depending on the level of complexity of the procedure. Therefore, it is important that the Patient is supervised by a nurse, physician and dietitian who will take care of the entire process and if any abnormalities develop, they will suggest adequate solutions.

Cast

Casts are rarely used in our Patients after multi-level surgeries. However, if a cast is applied, we encourage you to read the brochure entitled “Lower limb casting.” Sometimes we use a spica cast, which covers the pelvis, a portion of the trunk and the legs (to a variable extent). To learn more, please read the guide entitled “External apparatus and spica cast care.”

When to contact PEI?

Please contact us immediately if the following situations occur.

Wounds

- Wound dehiscence, redness, exudate, swelling or increased temperature.
- Concerns about postoperative wound care.

Pain

- Severe pain does not subside after medication administration, limb elevation or rest.
- Pain in the calves, swelling, pain behind the knees, redness or soreness occur.
- Pain control requires taking medications more than five times a day.
- Pain becomes severe after a relatively long period of comfort without a clear cause.
- Pain increases and new redness, swelling or thick discharge appears at the procedure site.
- Pain location changes without a clear cause.
- Pain occurs in the area covered by the cast but not at the postoperative wound site.
- Pain becomes intense and the methods discussed in this guide do not help.

Skin

- Areas of redness do not disappear within an hour of reducing pressure.
- Areas of pressure, cast or fixations cause open wounds.
- Signs of infection have appeared (redness, soreness, discharge and swelling).

- Severe pain, numbness, or burning (under or below the cast) do not subside after medication administration, limb elevation or rest.
- Difficulties with moving the fingers or toes and/or extreme pain upon small movement have appeared.
- Toes are pale or blue and/or are cold.
- An unpleasant smell is coming from the cast.
- Skin around the cast edge is cracked, covered with blisters or irritated.
- Something has fallen underneath the cast and is stuck.
- The cast has softened, broken or become damaged in any way.

Other causes

- Stomach pain, bloating, vomiting or diarrhea.
- Persistent fever above 38°C.
- Chest pain or shortness of breath.
- Pain or burning when urinating.
- Tingling, weakness, or numbness in the legs which does not subside after changing the position.
- Unusual headaches.
- Problems with intestines or bladder.
- Severe throat pain or irritation.



PHYSICAL THERAPY AND RECOVERY

After the procedure, approximately one year should be spent doing postoperative physical therapy, including strengthening and stretching exercises, appropriate positioning and learning completely new motor functions. During this process, the Patient will be able to use various orthopedic equipment tailored to their individual needs.

As each Patient's physical abilities and limitations are different, the physical therapy process and recovery can vary significantly. Preoperative health status and physical fitness play an important role in determining the postoperative possibilities. Some people will be able to perform all the activities discussed in this section. Others will be able to only do some of them. It will take between 3 and 6 months before the Patient is able to fully return to their previous activities. Talk to your physician or physiotherapist about selecting the appropriate activities.

In people with neurological problems postoperative physical therapy is of utmost importance. In this specific case it is not enough to surgically correct joint alignment, it is also necessary to teach the brain how to use the new abilities. This requires time and complete cooperation between the family and specialists.



Beata Wnuk - CP Treatment Specialist



First 3 weeks after surgery

The Patient will need their relatives' support for at least 3 weeks after surgery. Before leaving the hospital, a physiotherapist will provide detailed instructions on how to help the Patient in performing everyday activities, i.e.:

- moving from a bed to a wheelchair or toilet,
- turning in bed safely,
- using equipment after the hospital stay,
- appropriate positioning,
- performing excersises to prevent postoperative limb stiffness,
- getting into a car.

During this time, the objective of physical therapy will be to:

- maintain or increase the range of motion in the joints,
- prevent postoperative stiffness during healing.

Before leaving the hospital, a physiotherapist will teach the Patient's relatives how to perform passive physical exercises or demonstrate how to operate a special passive exercise (Continuous Passive Motion, CPM) machine.

If the surgery involves one or both legs, you can start using this device during the hospital stay. If necessary, the equipment can be rented for home use.

Most Patients are immobilized, cannot weight-bear on the operated limb and are unable to walk independently for three weeks after surgery. However, there are Patients who can fully weight-bear on the operated limbs directly after surgery. Physiotherapists will advise what activities will be appropriate for the Patient. It is likely that moving between places will not be easy in the beginning, so they will help prepare as well as possible for this. They will also explain all the changes which may occur in the lives of the Patient and their relatives.

Fear or pain can occur during physical therapy, especially when moving the legs for the first time after surgery. We recommend to take analgesics before every exercise session. The physiotherapist should be informed each time the Patient feels pain during therapy.

3-6 weeks after surgery

If the Patient's health allows it, the physician may suggest introducing additional activities 3–6 weeks after surgery. The aim of the physical therapy will be to use the full range of motion in all joints.

If the Patient uses a CPM machine, the physiotherapist can increase the range of motion until the Patient is able to freely move the limb between 0 and 90 degrees. Strengthening exercises will be added next. The Patient can support this process by:

- performing the exercises earnestly,
- changing positions (e.g. changing the position from lying down to sitting or standing),
- mobility exercises (e.g. rotating).

They can also start using an exercise bike.

Functional electrical stimulation (FES) can be introduced during exercises in order to additionally strengthen the muscles, gait patterns and body posture.

If the procedure involved bones, the Patient will not be allowed to weight-bear on the legs for at least 3 weeks afterwards. After that time, if an X-ray shows proper healing, weight-bearing exercises and gradual verticalization may be introduced.

In the case of soft tissue surgery (e.g. muscle lengthening), an ankle-foot orthosis (AFO) can be used as a support. Initially, the Patient will use a walking frame or crutches, even if they were able to walk independently before surgery. Learning a new gait pattern will require time. Regaining balance with a new quality of movement requires a long period of work with the nervous system but this is the only way to change incorrect movement patterns and habits.

The Patient may participate in physical therapy classes at PEI every day for the period required for complete recovery. From time to time, they can also take part in inpatient intensive physical therapy programs (2–3 weeks long) during which PEI physiotherapists will verify their progress and provide specific recommendations for further work at home or with a local physiotherapist whom they are willing to contact in order to discuss the entire physical therapy process.

Additionally, a physical therapist may recommend that the Patient perform specially prepared exercises in a home setting.

6 to 12 weeks after surgery

Between 6 and 12 weeks after surgery, the Patient will continue strengthening and mobilizing exercises to help them return to preoperative activity levels. Strengthening exercises should be performed everyday, increasing weight-bearing as the Patient gains strength. Neuromuscular electrical stimulation can improve muscle strength, gait patterns and body posture.

At this time, an orthosis may be needed which will help to properly weight-bear on the limbs and walk. When the gait pattern changes or stabilizes, orthosis wearing time and type may change. Specialists from the Orthotic and Prosthetic Specialists Association (OPSA) will advise on how often and how long orthoses should be worn.

An OPSA orthotist and PEI physiotherapist will help to fit an appropriate orthosis. If the patient does not have their own orthoses or outgrew their orthoses before surgery, it is better to wait before manufacturing new ones because orthotic needs may change after surgery. An OPSA orthotist together with an orthopedist will assess the need for orthoses, take measurements and ensure that they are ready to use right after the cast is removed (if it was applied). Since a scanner is used to take measurements for orthoses, this can be done shortly after surgery (e.g. when changing the cast).

As the Patient's endurance improves, they will be able to



increase the walking distance. The duration of using a walking frame or crutches depends on how rapidly they recover. Some Patients start walking independently when they stop using a walking frame but this is not always possible and crutches should be used for some time when walking around in order to avoid compensations, such as bending the trunk (leaning to one side when lifting the opposite leg). It may be necessary to perform additional strengthening exercises.

Physical therapy can end when the Patient achieves their set goals. Then it is recommended to continue regular stretching and strengthening exercises, as well as physical therapy performed before surgery. In order to maintain physical fitness, the Patient should perform aerobic exercises (e.g. cycling or swimming).

From time to time, the Patient can also take part in inpatient intensive physical therapy programs (2–3 weeks long) during which PEI physiotherapists will verify their progress and provide specific recommendations for further work at home or with a local physiotherapist whom they are willing to contact in order to discuss the entire physical therapy process.



SURGERY DESCRIPTIONS



This section of the guide describes the surgeries PEI surgeons perform on the legs. During the consultation with the orthopaedic doctor, you will find out what procedures the surgeon has planned for You or Your child.

Bone Procedures

- ☐ Varus derotation osteotomy of proximal femur (VDRO)
- ☐ Pelvic osteotomy
- ☐ Distal femoral extension osteotomy
- ☐ Tibial derotation osteotomy
- ☐ Modified Evan's calcaneal osteotomy
- ☐ Subtalar or talonavicular arthrodesis.
- ☐ First metatarsal osteotomy
- ☐ Medial cuneiform osteotomy

Corrective surgeries and soft tissue reconstructions

- ☐ Rectus femoris transfer
- ☐ Tibialis anterior transfer
- ☐ Tibialis posterior transfer
- ☐ Patellar tendon advancement with reconstruction of the extensor mechanism
- ☐ Iliopsoas lengthening
- ☐ Hamstring lengthening

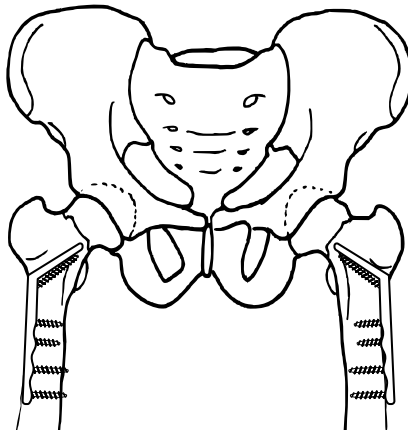
Bone Procedures

Some surgeries cut into your bones to help improve alignment of your legs and feet. Proper alignment enables you to be in the right position to strengthen your muscles and improve your ability to walk.

□ *Varus derotation osteotomy of proximal femur*

Aim: The procedure corrects an abnormal angle or rotation (excessive femoral anteversion) in the thighbone (femur), which causes the knees to rotate inward. Without this treatment, bones can move out of position (hip subluxation), which can manifest as discomfort or significant pain and, in the future, irreversible damage to the hip joint.

Description: We cut (osteotomy) the upper thighbone and correct its positioning and alignment. For internal stabilization, we use specially dedicated internal implants.

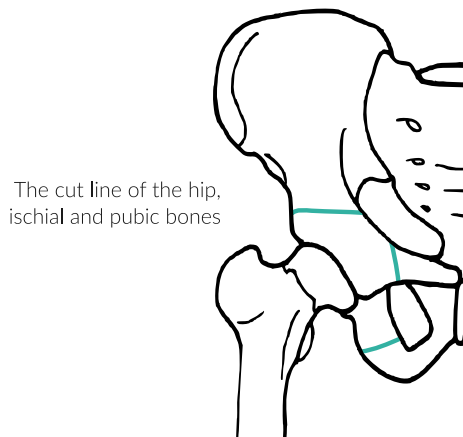


Bilateral VDRO osteotomy of the femurs

□ Pelvic osteotomy

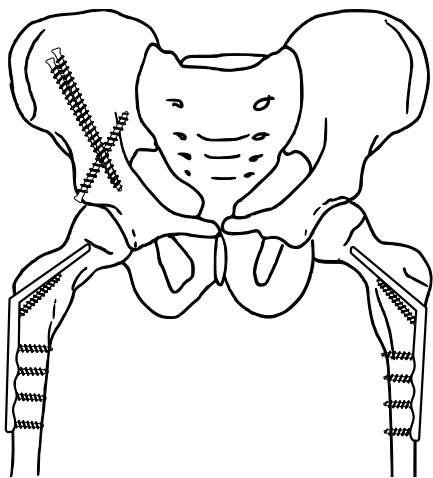
Aim: This procedure corrects instability in the hip joint caused by a hip socket that is too shallow (acetabular dysplasia). The surgery improves the hip socket's ability to cover the head of the thighbone (femur).

Description: There are different types of pelvic osteotomy (Dega, Salter, Pemberton, triple pelvic osteotomy – TPO). Generally speaking, the procedure involves cutting pelvic bone around the hip socket joint, then realigning the bones and correcting the socket's position and shape. Usually, we stabilize the fractures after osteotomy with screws or a bone graft. The most common osteotomy is Dega's single transiliac osteotomy, Paley's modified Dega's osteotomy or Salter's osteotomy, but when there is a very large underdevelopment of the socket, a triple pelvic osteotomy may be needed.

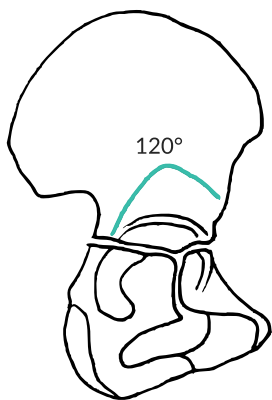


The cut line of the hip, ischial and pubic bones

Triple pelvic osteotomy



Triple pelvic osteotomy on the right side with simultaneous VDRO of the femur on both sides

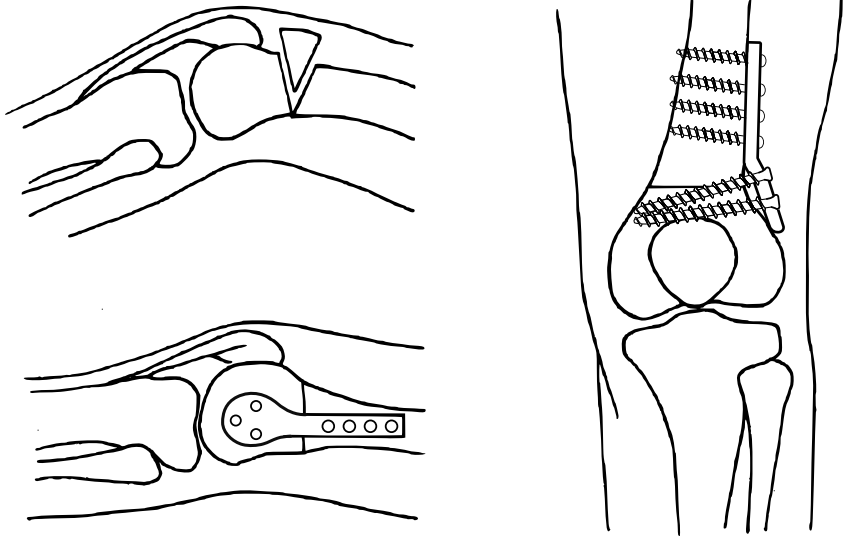


Paley's single "transiliac" pelvic osteotomy

□ *Distal femoral extension osteotomy*

Aim: The procedure addresses the inability to fully extend the knee (fixed flexion contracture). That inability might cause a crouched stance when you walk (crouch gait).

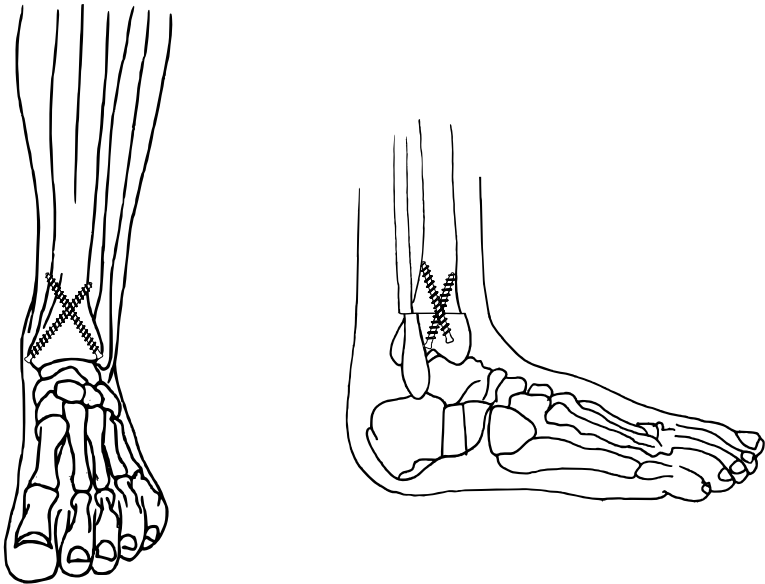
Description: We cut the thighbone (femur) just above the knee and remove a bone wedge to allow the knee to straighten. We then insert a metal plate and screws to maintain alignment until the bone heals. At the same time, if the Patient requires it, a procedure is performed to patellar tendon advancement with reconstruction of the upright apparatus.



□ **Tibial derotation osteotomy**

Aim: The procedure corrects an abnormal twist or rotation in the shinbone (tibial torsion) that can lead to intoeing or outtoeing. The twist prevents the foot and knee from aligning properly. In addition, it can lessen the strength and functioning of the calf muscles to maintain upright body position and while walking.

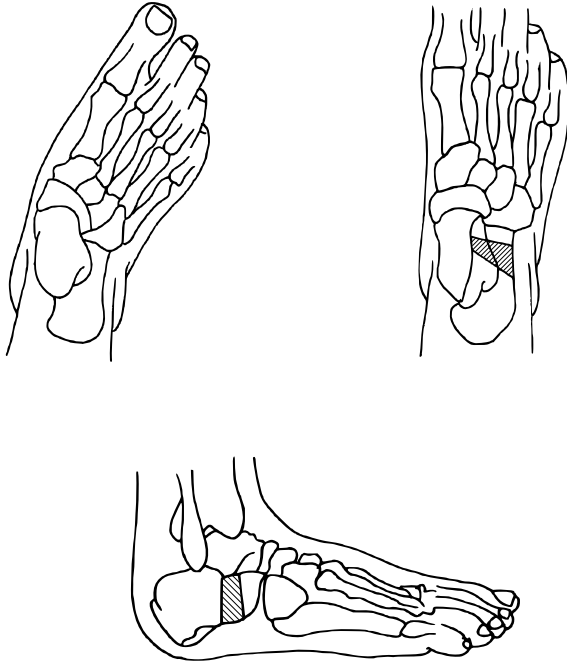
Description: We make an incision on the front of the lower leg, just above the ankle joint. We cut the tibia and fibula and then rotate to correct the abnormal anatomy. Finally, we insert screws to maintain proper alignment until the bone heals.



□ **Modified Evan's calcaneal osteotomy**

Aim: This procedure helps to correct a flat foot and oblong arch of foot. A significant flat foot can affect your ability to stand upright. It can contribute to a crouched gait and reduce your ability to push off with necessary strength while walking. It often leads to outward rotation of the foot (outoeing), can become painful and also cause problems with orthosis.

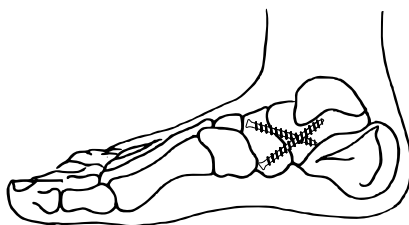
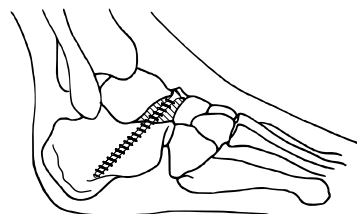
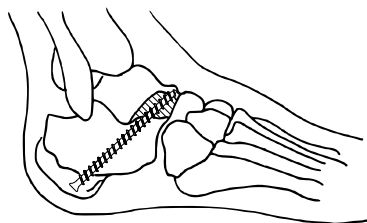
Description: We cut the heel bone (calcaneus) through an incision on the outer side of the foot, we correct the axis of the foot and insert a bone graft to improve the foot's alignment (position of the bones in relation to each other). Occasionally, the tendon of peroneus brevis is too short to allow realignment of the foot with a bone graft. In that case, the surgeon might lengthen the tendon. Calcaneal lengthening modified by Evans' method can be done with other procedures, such as shortening the ligaments in the arch area of the inner foot or performing a talonavicular fusion, osteotomy of the first metatarsal or medial cuneiform.



□ Subtalar or talonavicular arthrodesis

Aim: In some cases, the muscles in the foot can't maintain the stability of the foot's joints. Fusing the joint might be the only way to maintain proper foot alignment and eliminate joint instability. Contrary to the procedure of calcaneal lengthening, the arthrodesis is a procedure that provides permanent correction, therefore it is recommended that this procedure be performed in older children and adults.

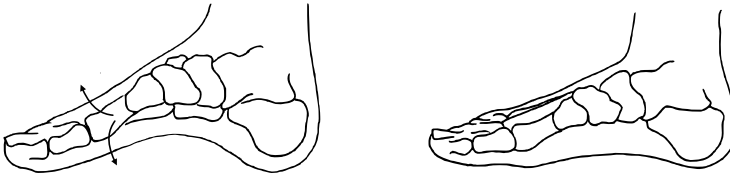
Description: We remove joint surfaces and fuse the bones. We insert screws to maintain alignment as the bones heal. Ankle joint motion (the up-and-down motion of the foot) is maintained, but the ability of pronation and supination of the foot decreases.



□ *First metatarsal osteotomy*

Aim: The procedure corrects a forefoot deformity by distributing the weight uniformly on the foot and correcting the foot's arch.

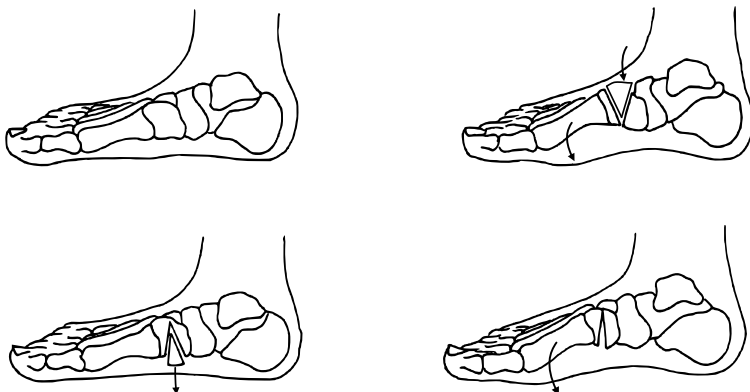
Description: We cut and realign the first metatarsal on the inner side of the foot. We insert implants to maintain alignment until the bone heals.



□ *Medial cuneiform osteotomy*

Aim: The procedure corrects a forefoot deformity by uniformly distributing weight on the front of the foot (forefoot).

Description: The surgeon cuts and realigns the bone (medial cuneiform) on the inner side of the foot. Then pins or special screws are inserted to maintain alignment and stabilize the foot until the bone heals.



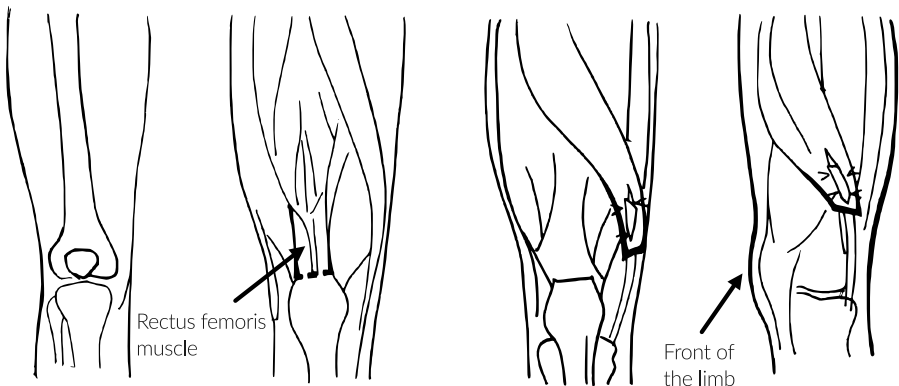
Corrective surgeries and soft tissue reconstructions

Ligaments, muscles, fascia and tendons are called soft tissues. Soft tissue surgeries correct muscle imbalances (balanced work of different muscle groups) that cause disorders in the lower limbs. These will be exacerbated as you grow if this imbalance is not corrected.

□ *Rectus femoris transfer*

Aim: The rectus femoris is a small, but long, muscle in the front of the thigh. When it is spastic or shortened, it can limit the ability to bend the knee and lead to a stiff gait. Transferring the muscle from its insertion on the kneecap to one of the hamstring tendons allows the knee to flex more readily.

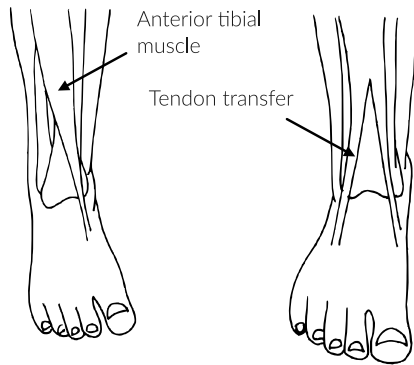
Description: We detach the tendon through an incision just above the kneecap. The muscle in the lower thigh can then pass closer to the inner side of the lower thigh. We typically secure the tendon to the gracilis or sartorius muscles.



□ *Tibialis anterior transfer*

Aim: Shortening the shinbone tendon can cause the foot to bear weight abnormally, causing inward rotation (intoeing) or high arch (cavus). The surgery balances the muscles that control motion in the back and middle of the foot (subtalar joint complex).

Description: We remove half or all of the tendon from its attachment to the bone. We split the tendon upward above the ankle, route the detached half to a new position, and secure it to the bone. In addition, we might lengthen the tendon by dividing the muscle belly (intramuscularly) or by doing a step-cut within the tendon (z-lengthening) to gain extra length. A complete transfer involves dividing the attachment of the tendon, moving the tendon to a new bone, and resecuring it with a suture or bone anchor.



□ *Tibialis posterior transfer*

Aim: Shortening the calf tendon (posterior tibial tendon) can cause the foot to bear weight abnormally, causing inward rotation (intoeing) or high arch (cavus). The surgery balances the muscles that control motion in the back and middle of the foot (subtalar joint complex).

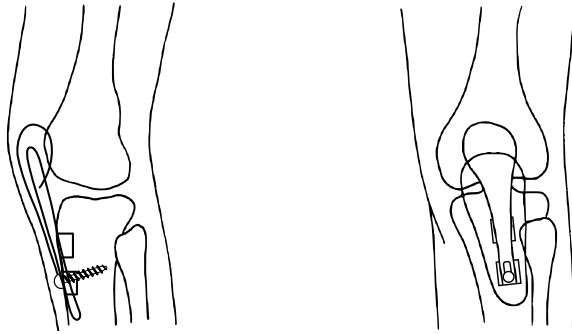
Description: We remove half or all of the tendon from its attachment to the bone. We split the tendon upward above the ankle, route the detached half to a new position, and secure it to the bone. A complete transfer involves dividing the attachment of the tendon, moving the tendon to a new bone, and resecuring it with a suture or bone anchor.



□ *Patellar tendon advancement with reconstruction of the extensor mechanism*

Aim: The procedure corrects the abnormal lengthening of the kneecap (patellar) tendon, which results in a kneecap position that is higher than normal (patella alta). The abnormality can make it difficult to extend the knee fully (extension lag). Walking with a crouched stance (crouch gait) might lead to knee pain, arthritis and a deterioration in your gait pattern.

Description: After your bones have matured, we can move a block of bone (with the patellar tendon attached) from the upper end of the shinbone (tibia) to a lower point on the tibia. We secure the block of bone to the new position with metal screws and/or wires.

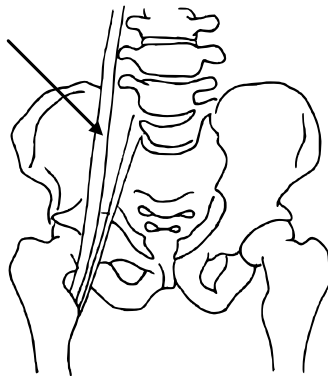


Before the completion of bone growth, reconstruction involves reinsertion (i.e. re-sewing of the ligament) with special threads into the correct attachment site. At PEI, we use a unique modification of this method involving the use of a special stress-relieving loop to heal the tendon.

□ *Iliopsoas lengthening*

Aim: If the iliopsoas muscles are short or spastic, the hip can't extend fully. That can cause you to lean forward or arch the lower back.

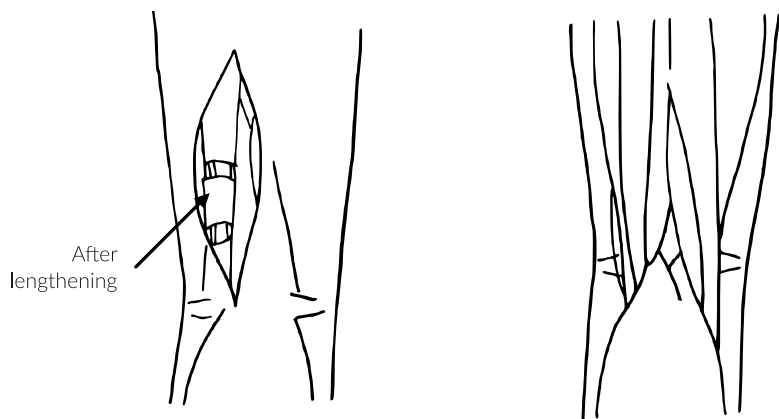
Description: Through an incision in front of the hip joint, we divide the tendon, allowing it to lengthen while leaving hip muscle fibers intact.



□ Hamstring lengthening

Aim: A short or spastic hamstring can limit the ability to extend the knee. It can also disrupt the normal curve of the lower back, causing a flat back.

Description: Through an incision just above and behind the knee, we expose the hamstring tendons and muscles. Then we use a variety of methods to lengthen the tendons while saving their continuity and muscle bellies.



There are many more surgical procedures performed in PEI, not all of which are described here. Each time, we carefully analyze the Patient's mobility, perform a full clinical physiotherapeutic and medical examination, analyze additional images and determine the needs and goals of the Patient and his family. We then individually select the procedures that will bring the best results in a given case.

GLOSSARY



Abductor wedge – soft, sponge-like material that placed between the legs after a hip surgery to keep the legs wide apart, especially when the Patient is lying in bed.

Ankle-foot orthosis (AFO) – an orthosis which stabilizes the foot and ankle, helping to maintain proper alignment, improving weight-bearing and mobility, as well as minimizing the potential orthopedic complications.

Bone graft – surgeons can use a bone from the Patient or a donor to place it an area where a bone was removed.

Bone procedures – surgeries which involve cutting bones (osteotomy).

Clothing – it is good to prepare a set of clothes which are easy and quick to put on. An additional zipper or snaps can be sewed in the trousers so that they can be completely unfastened

Continuous passive motion (CPM) machine – a passive exercise machine which fully supports the lower limbs and allows gentle motion of the knee when lying in bed. A CPM device can be used for 30 minutes several times a day. A physiotherapist will provide detailed instructions on how to use the machine and in what ranges.



Contracture – muscle tension may prevent the joint from moving through its full range of motion. After some time, the muscle becomes shorter due to prolonged positioning in one position, weakening or spasticity.

Derotation abduction splint (also known as Denis Browne bar) – a removable splint attached to the cast which keeps Patient in an abducted position with appropriate rotation. It often joins two short leg casts.

Discharge - after discharge the Patient returns home or starts physiotherapeutic care at PEI. Before discharge, the Patient receives medical instructions regarding further treatment and exercises to be performed independently or with a caregiver's assistance.

Dislocation – displacement of a bone from its normal position in the joint.

Epidural anaesthesia (EA) - medication is administered through a catheter placed directly in the spine.

Fixation plate – a stainless steel plate which keeps the bones together.

Flexion – joint flexion range measured in degrees.



Functional electrical stimulation (FES) – a process in which muscle fibers are stimulated with electrical current, increasing muscle contractility, sensory awareness, as well as range of motion and muscle strength.

Gait - walking

Home exercise plan (HEP) - a physiotherapist develops exercise plans for Patients to be performed regularly after leaving the hospital or clinic.

Knee orthosis (knee tutor) – a soft, removable fabric orthosis with Velcro straps used to protect Patient's knees and keep them extended.



Osteotomy – cutting a bone so that it can be realigned.

Patient-controlled analgesia (PCA) pump – a method which allows the Patient (or people) to control the amounts of analgesics being administered.

Positioning mattress - a mattress made individually for the Patient to secure an adequate body position after the procedure.



Post-operative cast - a synthetic cast in which a cut is made may be applied directly after surgery to immobilize the area and allow swelling at the same time. After 2–3 weeks the cast is changed or replaced with an AFO orthosis.



Prone position – lying on the stomach with the face down. Patients usually spend some time in the prone position after hip surgery to stretch the hip muscles.

Range-of-motion exercises – the exercises performed after SEMLS help the joints regain their normal range of motion (ability to flex and extend).

- **Passive range of motion (PROM)** – these movements do not require actively moving the body. A physiotherapist or caregiver exerts gentle pressure while moving the joints and muscles in order to prevent stiffness. Before leaving the hospital, PEI physiotherapists demonstrate how to perform the exercises.



- **Active assisted range of motion** – the Patient actively moves their body with some assistance from the physiotherapist.

- **Active range of motion** – the Patient actively moves their muscles by performing regular exercises without any assistance.

Short leg cast – a cast applied on the lower leg which ends just below the knee.

Single-event multilevel surgery (SEMLS) – SEMLS corrects two or more problems in one or both legs during a single surgery. The surgeons align bones and correct muscles and tendons in order to help Patients improve or maintain their motor abilities. Addressing all the issues in lower limbs during a single surgery allows a significant reduction in recovery time and provides optimal conditions for the Patient to obtain the best possible functional outcomes.

Soft tissue procedures – surgeries which involve muscles, fascia or tendons but not bones.

Spasm – an uncontrolled, usually rapid muscle twitch, often associated with increased pain.

Spica cast – a cast which covers a portion of the trunk, pelvis and lower limbs, and keeps the Patient in a stable position with abducted legs.

Steri-Strips – small transparent strips placed directly over the surgical wound to enhance healing.

Subluxation – partial dislocation of a bone in the joint which may or may not return to its proper position.

Transfer – moving from one surface to another (e.g. from bed to a wheelchair, from wheelchair to a car or from a wheelchair to commode chair).

Weight-bearing ability – in order to protect the bones and enable their proper healing after surgery, the Patient has to know and adhere to their weight-bearing restrictions. A physician will determine the Patient's ability to weight bear and will change it as the bones and muscles heal.

- No weight-bearing: the Patient must not weight-bear on the legs or stand on them.

- Partial weight-bearing: the Patient can weight-bear on the legs slightly while using a walking frame or crutches. Weight-bearing may also be gradually increased on a verticalization table. A PEI physiotherapist will demonstrate exactly how to weight-bear on the limbs to the permitted extent.

- Weight-bearing as tolerated: the Patient may weight-bear on the legs to the extent they feel comfortable.



FREQUENTLY ASKED QUESTIONS

Below you will find some questions which the Patient may have before, during and after the hospital stay. These instructions contain general information on this topic so we encourage you to contact a PEI physician or medical care coordinator and ask questions regarding specific cases.

How will we get back home from the hospital?

A spacious vehicle will come in handy to accommodate the Patient and any equipment that will go home with him. A physiotherapist will demonstrate how to safely transport the person after the surgery. The PEI medical care coordinator will discuss transportation options and help to arrange the transportation that Paley European Institute offers.

What changes do we need to make at home?

When the Patient returns home after surgery, they will probably need some new equipment which can take up some space, e.g. a rehabilitation bed or positioning mattress. It may be necessary for a parent or caregiver to sleep near the child to help them change position at night.

Who will help manage pain?

Pain relief options will differ depending on the scope of surgery, Patient's abilities and their pain tolerance. Apart from pharmacological treatment, Paley European Institute offers alternative methods of pain management which will be discussed with you by a physiotherapist and psychologist.

What will getting in and out of bed look like?

Before leaving the hospital, parents or caregivers will learn how to transfer the child to and out of bed (this is referred to as transfer training with a physiotherapist) in the first weeks of recovery.

What will taking a bath or shower look like?

For the first three weeks after surgery only a bed bath using a sponge will be possible.

What will using the toilet look like?

Before the Patient leaves the hospital, parents or caregivers will learn how to help the Patient to use a bed pan, toilet, urinal and/or urinary bottle.

What kinds of clothes can be worn after surgery?

The Patient will be able to wear their own clothes as often as possible. However, it may be necessary to modify trousers, shorts and skirts so that they fit a potential cast or can be changed easily.

Will additional surgeries be required?

Not always. However, if the surgery required the use of plates and screws, another surgery will be required to remove them. In some Patients there is a risk of recurrence of deformities. Therefore, regular follow-up and observation is crucial.

When will a return to school be possible?

Returning to school will be possible after a period of 3 to 6 months. An orthopedist will provide you with more information.

Will it be necessary to wear a cast?

Patients treated at Paley European Institute very rarely have a cast applied. If it is necessary, a cast made of "light" fiberglass cast is used. Patients who have undergone hip surgeries do not wear hip casts.

We encourage you to read the other publications:



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