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# **Soft Tissue Sarcoma**

## ****What is Soft Tissue Sarcoma (STS)?****

## Soft tissue sarcoma is cancer that starts in the cells of connective tissue and other supporting tissues. This can include fat, muscle, tendons, ligaments, and blood vessels. Soft tissue sarcomas start in mesenchymal cells. These are the basic cells that form intodifferent types of soft tissue. They can develop in any part of your body, however, approximately 40% of STS occur in the extremities, 10% in the trunk, 16% in the retroperitoneal/abdominal cavity, 22% viscera and 12% in other sites (like head & neck). Approximately 1,250 Canadians are diagnosed with soft tissue sarcoma each year.

## What are the Most Common Types of STS?

There are over 50 different types of soft tissue sarcoma, however the most common types include:

* Liposarcoma
* Leiomyosarcoma
* Undifferentiated pleomorphic sarcoma
* Myxofibrosarcma
* Synovial Sarcoma
* Angiosarcoma
* Rhabdomyosarcoma
* Alveolar soft part sarcoma
* Fibrosarcoma
* Gastrointestinal stromal tumor

## What are the Risk Factors causing this cancer?

Many risk factors for soft tissue sarcoma have been identified. While soft tissue sarcoma can develop in people without these risk factors, common risk factors for this form of cancer include:

* Personal history of cancer
* Radiation therapy
* Genetic conditions
* Chronic lymphedema
* Viral infections, including HIV
* Exposure to vinyl chloride
* Exposure to thorium dioxide

## What are the Clinical Manifestations?

Soft tissue sarcoma might not cause any signs and symptoms early in the course of the disease because it develops in areas where the tumor can push the soft tissue out of the way as it develops and grows. Symptoms usually appear when the tumor grows into surrounding structures (like organs). The symptoms of soft tissue sarcoma will differ depending on where the tumor is located. Some common initial signs or symptoms of soft tissue sarcoma include:

* A painless lump in a limb or the head and neck area
  + Size varies broadly, with 1/3 of these tumors being over 10 cm at diagnosis
* Feeling of fullness
* Abdominal pain
* Nausea/vomiting
* Heartburn
* Bleeding in the stomach or intestines
* Slightly elevated purple, brown, red or pink spots on the skin
* Lymphedema or swelling in an extremity
* Difficulty breathing
* Unexplained cough or chest pain

## What are the Treatment Options?

Each case is unique and requires a personalized medical treatment plan. The main types of treatment for soft tissue sarcoma include:

* Surgery:removal of the abnormal cancerous tissue and surrounding tissue. Limb sparing surgery is often the goal, however in some cases, limb amputations occur. Reconstruction procedures may often be done at the same time as the resection surgery.  
  Chemotherapy: systemic treatment to kill cancer cells and prevent them from dividing.
* Radiation therapy: doses of high-energy rays used to kill cancer cells. Radiation is usually done after surgery as an added measure to attempt to kill any cancer cells left behind. Radiation may also be used before surgery to shrink the tumor and make the surgery easier.
* Targeted therapy: uses drugs or other substances to identify and attack cancer cells while doing little damage to normal healthy cells. This form of therapy will alter the way a cancer cell grows, divides and repairs itself.
* Clinical trials: ongoing clinical trials investigate combined and/or new therapies for STS treatment.

What are the Possible Side Effects of Treatment?

1) Surgery:

* Pain
* Infection
* Swelling
* Wound separation
* Blood clots
* Stiffness and weakness in the limbs
* Limb amputation
* Nerve damage
* Scarring
* Lymphedema

2) Radiation Therapy:

* Fatigue
* Skin irritation
* Limb swelling
* Pain
* Weakened muscles and decreased range of motion in the extremity treated
* Bone fracture(s)
* Nausea/vomiting
* Lymphedema

3) Chemotherapy:

* Nausea/vomiting
* Loss of appetite
* Sore mouth
* Injection site pain
* Fatigue
* Hair loss
* Bone marrow suppression
* Organ damage
* Fertility problems

4) Targeted Therapy:

* Nausea/vomiting
* Swelling
* Skin rash
* Fatigue
* Muscle and joint pain
* Sore mouth
* Changes in taste
* Loss of appetite
* Changes in blood pressure
* Hand-foot syndrome

## What is the Role of Physiotherapy and Rehab?

The goals of rehabilitation depend on the extent of the disease and the treatment that a patient has received. Physiotherapy can help manage the side effects of treatment and improve functional levels for individuals with soft tissue sarcoma. This can be done using a variety of treatment approaches.  
   
Physiotherapy after Surgery:

* Gait retraining
  + After surgery to remove a cancerous tumor in the leg it could take up to a year before the survivor walks again. Muscle strengthening of both the upper and lower extremities, balance training, coordination exercises, range of motion exercises, and specific gait training strategies should be planned and performed before and after surgery with a physiotherapist.
  + Specific surgical reconstruction procedures (e.g. Van Ness Rotationplasty) require guidelines from the orthopedic surgeon who performs the technique
  + After leg amputation, a physiotherapist will be involved with survivors to help them learn to use a prosthesis.
    - With the help of a physiotherapist, most individuals are walking again in 3-6 months post amputation.
    - A physiotherapist should also be involved in teaching survivors how to take care of the stump. This includes keeping the stump dry and clean,and bandaging the stump after surgery to help reduce swelling and shape the stump.
    - Physiotherapists also work with survivors to adapt activities of daily living so that they can function as independently as possible.
* Lymphedema post Limb-salvage surgery
  + Lymphedema is a serious complication following limb salvage for extremity STS.
  + The overall incidence of lymphedema in STS is unclear, however risk factors for lymphedema included depth of tumor and tumors >5 cm in size and possibly radiotherapy.
  + It has been reported that cancer patients are not always informed about lymphoedema symptoms or management and that the uses of prevention strategies could be improved.
  + The occurrence of lymphedema might be minimized through increased awareness, education, and therapy. Referral to a certified Lymphedema therapist is important in this population to determine the potential effect of education, prophylactic interventions and management.

Physiotherapy after Radiation

* Joint stiffness, decreased joint range of motion, and decreased muscle strength are common after radiation treatment.
* Physiotherapist can help prevent and minimize disability after radiation by education survivors on range of motion exercise to start early and do often during the course of treatment.

Physiotherapy and Physical Activity during Chemotherapy

* New research suggests people with soft tissue sarcoma are safe to start sessions of supervised rehabilitation and low-intensity exercise after surgery.
* It is suggested that these individuals increase exercise intensities progressively under guidance of a health care professional.
* Survivors should aim to build up to moderate intensity resistance and endurance exercise. 30-60min/day has been said to be safe after surgery and during adjuvant chemotherapy and radiation.

The general physical activity recommendations for cancer patients are said to be feasible for this population of cancer survivors after 18-24 months of rehabilitation. These recommendations include 150min/week of combined moderate-intensity endurance/resistance exercises.

## References & Resources

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