



Potential late effects of cancer treatment

Chemotherapy, radiotherapy and surgery used in the management of cancer can lead to long-term adverse health effects which may manifest many years after completion of treatment. Ongoing screening and management of potential late effects of cancer treatments in long-term cancer survivors is essential in optimising health outcomes.

The risk and nature of late effects of cancer treatment are dependent on multiple factors, including:

- **The type and site of cancer treated;**
- **The age at time of treatment;**
- **The treatment modalities utilised;**
- **The amount and combination of treatments administered;**
- **The treatment area; and**
- **Co-existing medical conditions.**

Important late effects of cancer treatment are listed overleaf. Long-term cancer survivors, particularly those who have had childhood malignancies, and who have had complex combination chemotherapy and radiotherapy may require specialist follow up in a Late Effects Clinic.

All long-term cancer survivors should be advised regarding health optimisation measures, including:

- **Healthy diet and exercise;**
- **Maintaining a healthy weight;**
- **Limiting sun exposure;**
- **Avoidance of smoking, excessive alcohol and illicit drug use; and**
- **Cancer screening.**



Radiotherapy and secondary malignancy

Malignancies secondary to radiotherapy may occur in the radiotherapy treatment field. Routine cancer screening should be undertaken in all patients, including skin checks, breast screening, and bowel cancer screening.

Thyroid screening

Radiation to, or near the neck may predispose to the development of thyroid nodules and thyroid cancer. These patients require regular thyroid ultrasound surveillance and further investigation of suspicious or enlarging thyroid nodules greater than 5mm.

CNS tumours after cranial irradiation

Long-term survivors of brain tumours who have received radiotherapy may be at increased risk of developing meningiomas, cerebral vascular abnormalities and radiation-induced brain malignancies. These patients require ongoing surveillance with brain imaging.

Cardiovascular risk factors

Radiotherapy to cerebral, cardiac and other blood vessels may contribute to accelerated atherosclerotic vascular disease. These patients require appropriate proactive treatment of co-existing cardiovascular risk factors, including obesity, dyslipidaemia and hypertension management, and smoking avoidance.

Chemotherapy and cardiac effects

Anthracycline chemotherapy agents (Doxorubicin, Daunorubicin, Idarubicin, Epirubicin), which are commonly used in haematological malignancies, may cause delayed cardiac effects. There is an additional risk of cardiac deterioration in pregnancy where there is increased strain on the heart. Early cardiologist opinion should be sought, particularly between 15 – 20 weeks gestation.

Infection risk after splenectomy

Patients who have undergone splenectomy or have had radiotherapy to the spleen are susceptible to infection with encapsulated organisms. All asplenic patients should receive appropriate immunisation against pneumococcus, meningococcus, HIB and annual influenza vaccination. Prophylactic antibiotics may also be required. For more information, go to www.spleen.org.au.

Pituitary endocrine insufficiency

Patients who have received cranial irradiation may be at risk of pituitary endocrine insufficiency, which manifest as hypothyroidism, metabolic syndrome, growth hormone deficiency in children, low testosterone in men and premature menopause in women. Central adrenal insufficiency may become evident at times of physiological stress such as general anaesthesia, and such patients should undergo pre-operative assessment.

Effects on fertility

Patients who have received high dose chemotherapy or pelvic irradiation may be at risk of hypogonadism and infertility. At risk patients should have bone mineral density assessment, and be offered referral to a fertility specialist.

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