London and South East Sarcoma Network

Follow-up Guidelines for Bone and Soft Tissue Sarcomas

1. Follow-up Guidelines for Soft Tissue Tumours†

Stage of disease	Disease monitoring
1. Localised extremity post-surgery ± radiotherapy	
Benign tumours/atypical lipomatous tumours	
Year 1	- post-operative visit in first 6 weeks - supported discharge
Low grade	
Year 1	- post-operative visit in first 6 weeks - 3 month clinical examination (to check function, if necessary) - 6 monthly clinical examination[1], CXR
Year 2	- 6 monthly clinical examination, CXR
Years 3+	- annual clinical examination, CXR
Discharge at 10 years after surgery	
Intermediate and high grade	
Year 1	- post-operative visit in first 6 weeks - 3 - 4 monthly clinical examination, CXR - image prosthesis at 6 months and 1 year
Year 2	- 3 - 4 monthly clinical examination, CXR - image prosthesis annually
Years 3 – 4	- 6 monthly clinical examination, CXR - image prosthesis annually
Years 5 – 10	- annual clinical examination, CXR - image prosthesis annually
Discharge at 10 years after surgery unless: - Patient has had radiotherapy with toxicity that requires long term follow-up - Patient has a prosthesis *in situ* (follow-up evaluation by orthopaedic team) - Teenage and young adult patients (<25 years at diagnosis) - will require long term follow-up in a late effects service - Clinical trial patients on active follow-up	
2. Abdominal/retroperitoneal/gynaecological sarcomas post-surgery (excluding GIST)	*Comment*: Because of the uncertainty about the timing and benefits of intervention for recurrent disease, surgical or otherwise, in this group of sarcomas follow up can take two forms: radiologically directed follow-up, or clinically directed follow-up. The choice of follow-up protocol is a clinical decision between clinician and patient, taking into account biological factors of the particular histological sub-type.
Radiologically directed follow-up	
Low grade	
Year 1	- post-operative visit in first 6 weeks - 3 - 6 monthly clinical examination - baseline CT chest/abdo/pelvis[2] post surgery, then at 6 and 12 months
Year 2	- 6 monthly clinical examination

	- CT scan chest/abdo/pelvis[2] at 18 and 24 months
Year 3+	- annual clinical examination - annual CT chest/abdo/pelvis[2] to 10 years
Discharge at 10 years after surgery	
Intermediate and high grade*	
Year 1	- post-operative visit in first 6 weeks - 3 monthly clinical examination, CXR - baseline CT chest/abdo/pelvis[2] post surgery, then at 6 and 12 months
Year 2	- 3 monthly clinical examination, CXR - CT scan chest/abdo/pelvis[2] at 18 and 24 months
Years 3 – 4	- 6 monthly clinical examination and CXR - annual CT chest/abdo/pelvis[2]
Years 5 – 10	- annual clinical examination and CXR - annual CT chest/abdo/pelvis[2] year 5, then stop
Discharge at 10 years after surgery	
Clinically directed follow-up	
Follow up intervals as above, with evaluation for new abdominal symptoms and clinical examination. Scanning (CT chest/abdo/pelvis[2]) is instituted for clinical suspicion of recurrence. Chest surveillance is performed at each visit by CXR.	
3. Head and neck sarcomas	
Year 1	- post-operative visit in first 6 weeks - 3 monthly clinical examination and CXR - post-treatment MRI of primary site at 3 months after completing treatment - surveillance MRI of primary site at 9 months
Year 2	- 3 monthly clinical examination and CXR - surveillance MRI of primary site at 15 and 21 months
Years 3 – 4	- 6 monthly clinical examination and CXR - surveillance MRI of primary site at 27 months - thereafter annual MRI of primary site
Years 5 – 10	- annual clinical examination and CXR
Discharge at 10 years after surgery	
4. Post pulmonary metastasectomy	
Year 1	- post-operative visit in first 6 weeks - 3 monthly clinical examination, CXR - baseline CT scan and CXR post surgery (within 3 months) - thereafter 6 monthly CT scans
Year 2	- 3 monthly clinical examination, CXR - CT scans at 18 and 24 months
Years 3 – 4	- 6 monthly clinical examination and CXR - continue CT scans at clinician's discretion if felt to be at high risk or recurrence

Years 5 – 10	- annual clinical examination and CXR
Discharge at 10 years after surgery	
5. Locally advanced or metastatic disease	
Year 1+	- 3 monthly clinical examination and CXR (or more frequently as clinically indicated) - imaging of disease sites as clinically appropriate at clinician's discretion (usually 3 monthly CT scan)

† **Patients treated within clinical trials should be followed up according to the trial protocol.**

[1] Routine imaging of primary site at clinician's discretion, if clinical detection of recurrence is anticipated to be difficult, e.g. deep tumours; large tumours; post-radiotherapy.

[2] Alternatives to CT chest abdomen and pelvis include:

- CT abdomen and pelvis, CXR
- MRI abdomen and pelvis, CXR
- Abdominal ultrasound scan, transvaginal ultrasound scan, CXR (for gynae sarcomas)

2. Follow-up guidelines for benign bone tumours (aneursymal bone cyst, giant cell tumour), well-differentiated cartilageonous tumours (grade 1 - 3 chondrosarcoma), periosteoal and parosteal osteosarcoma, chordoma

Stage of disease	Disease/late toxicity monitoring
1. Aneurysmal bone cyst, giant cell tumour	
Primary presentation	
Year 1	- post-operative visit in first 6 weeks - 3 - 6 monthly clinical examination, plain films of primary site, CXR for patients presenting with pathological fracture
Years 2 - 3	- 6 monthly clinical examination, plain films of primary site, CXR for patients presenting with pathological fracture
Discharge 3 years after surgery	
After local recurrence	
Year 1	- post-operative visit in first 6 weeks - 3 - 6 monthly clinical examination, plain films of primary site, CXR
Years 2 - 5	- 6 monthly clinical examination, plain films of primary site, CXR
Discharge 5 years after surgery	
2. Grade 1 chondrosarcoma	
Localised post primary treatment – curettage +/- cementation	
Year 1	- post-operative visit in first 6 weeks - 3 - 6 monthly clinical examination, plain films of primary site[1]
Years 2 - 5	- 6 monthly clinical examination, plain films of primary site[1]
Discharge at 5 years from surgery	
Localised post primary treatment – on observation only	
Years 1 - 2	- interval MRI scans at 6 months and 18 months. If no change, and patient does not want curettage, discharge.
3. Grade 2 – 3 chondrosarcoma, periosteal and parosteal osteosarcoma	
Localised post-resection	
Years 1 - 2	- post-operative visit in first 6 weeks - 3 monthly clinical examination, plain films of primary site[1], CXR
Years 3 – 5	- 6 monthly clinical examination, plain films of primary site[1], CXR
Years 6 - 10	- annual clinical examination, plain films of primary site[1], CXR
Discharge at 10 years from surgery	

4. Chordoma	
Localised post-resection +/- radiotherapy	
Years 1 - 2	- post-operative visit in first 6 weeks - 3 – 6 monthly clinical examination, CXR - MRI of primary site at 6 months, 1 year, 2 years
Years 3 - 5	- 6 monthly clinical examination, CXR - MRI of primary site annually
Years 6 - 10	- annual clinical examination, CXR, MRI of primary site
Discharge at 10 years from surgery	

[1] Plain films not required after amputation

2. Follow-up Guidelines for high grade osteosarcoma/spindle cell sarcoma of bone/dedifferentiated chondrosarcoma†

Stage of disease	Disease/late toxicity monitoring
1. Localised post primary treatment	
Year 1	- post-operative visit in first 6 weeks (if primary surgery) - 2 monthly clinical examination, CXR, plain films of primary site[1] - annual blood biochemistry (U&E, LFT, Ca, PO_4, Mg, HCO_3)[2] - end of year 1 - gonadal function (males: testosoterone, LH, FSH; females: oestradiol, LH, FSH) [2]
Year 2 - 3	- 3 monthly clinical examination and CXR, plain films of primary site[1] - annual blood biochemistry (U&E, LFT, Ca, PO_4, Mg, HCO_3) [2] - end of year 2 - MUGA or ECHO[2]
Year 4	- 6 monthly clinical examination and CXR, plain films of primary site[1] - annual blood biochemistry (U&E, LFT, Ca, PO_4, Mg, HCO_3) [2] - end of year 4 - MUGA or ECHO[2]
Year 5	- 6 monthly clinical examination and CXR, plain films of primary site[1] - annual blood biochemistry (U&E, LFT, Ca, PO_4, Mg, HCO_3) [2]
Years 6 - 10	- annual clinical examination and CXR, plain films of primary site[1] - annual blood biochemistry (U&E, LFT, Ca, PO_4, Mg, HCO_3) [2] - end of year 6 - MUGA or ECHO[2]
Discharge at 10 years after surgery, unless: - Patient has had radiotherapy with toxicity that requires long term follow-up - Patient has a prosthesis *in situ* (follow-up evaluation by orthopaedic team) - Teenage and young adult patients (<25 years at diagnosis) - will require long term follow-up in a late effects service - Clinical trial patients on active follow-up	
2. Post pulmonary metastatectomy	
Year 1	- post-operative visit in first 6 weeks - 3 monthly clinical examination, CXR, plain films of primary site - baseline CT scan post surgery, thereafter 6 monthly
Year 2	- 3 monthly clinical examination, CXR, plain films of primary site - 6 monthly CT scan
Years 3 – 4	- 6 monthly clinical examination, CXR, plain films of primary site
Years 5 – 10	- annual clinical examination, CXR, plain films of primary site

Discharge at 10 years after surgery	
3. Relapsed metastatic disease	
Year 1+	- 2 - 3 monthly clinical examination and CXR - imaging of disease sites as clinically appropriate

† **Patients treated within clinical trials should be followed up according to the trial protocol.**

[1] Plain films not required after amputation
[2] Investigations to be carried out post-chemotherapy only

3. Follow-up Guidelines for Ewing's sarcoma/Rhabdomyosarcoma†

Stage of disease	Disease/late toxicity monitoring
1. Localised post primary treatment	
Year 1	- 2 monthly clinical examination, CXR, plain films of primary bony site[1] - soft tissue tumours – baseline end of treatment MRI/CT primary site, thereafter at clinician's discretion[2] - radiotherapy as definitive local treatment - baseline end of treatment MRI/CT of primary site, then at 6 and 12 months - end of year 1 - gonadal function (males: testosterone, LH, FSH; females: oestradiol, LH, FSH); renal function (Cr, Na, K, Ca, PO_4, HCO_3, tubular phosphate resorption)
Year 2 - 3	- 3 monthly clinical examination, CXR, plain films of bony primary site[1] - MRI of soft tissue primary site at clinician's discretion[2] - radiotherapy as definitive local treatment - MRI/CT of primary site at 18 and 24 months - MUGA/ECHO 2 years post diagnosis[3] - Annual renal function (Cr, Na, K, Ca, PO_4, HCO_3, tubular phosphate resorption)
Year 4	- 6 monthly clinical examination, CXR, plain films of primary site[1] - MRI of soft tissue primary site at clinician's discretion[2] - MUGA/ECHO 4 years post diagnosis[3] - Annual renal function (Cr, Na, K, Ca, PO_4, HCO_3, tubular phosphate resorption
Year 5	- 6 monthly clinical examination, CXR, plain films of primary site[1] - Annual renal function (Cr, Na, K, Ca, PO_4, HCO_3, tubular phosphate resorption
Years 6 - 10	- annual clinical examination, CXR, plain films of primary site[1] - MUGA/ECHO 6 years post diagnosis[2] - Annual renal function (Cr, Na, K, Ca, PO_4, HCO_3, tubular phosphate resorption
Discharge at 10 years after surgery, unless: - Patient has had radiotherapy with toxicity that requires long term follow-up - Patient has a prosthesis *in situ* (follow-up evaluation by orthopaedic team) - Teenage and young adult patients (<25 years at diagnosis) - will require long term follow-up in a late effects service - Clinical trial patients on active follow-up	
2. Relapsed metastatic disease	
Year 1+	- 2 - 3 monthly clinical examination and CXR - imaging of disease sites as clinically appropriate

† **Patients treated within clinical trials should be followed up according to the trial protocol.**

[1] Plain films of primary site not required after amputation
[2] If clinical detection of recurrence is anticipated to be difficult
[3] Perform only for patients who have received doxorubicin

4. Follow-up Guidelines for Gastrointestinal Stromal Tumours†

Stage of disease	Disease monitoring
1. Post-resection of localised disease	
***Very low risk*[1]**	
No follow-up required – discharge to primary care.	
***Low risk*[1]**	
Year 1	- CT abdo/pelvis[2] +/- CXR[3] at 12 months post-surgery. Then discharge.
***Intermediate risk*[1]**	
Year 1	- baseline CT abdo/pelvis[2] +/- CXR[3] post-surgery and 6 months later
Years 2 - 5	- annual CT abdo/pelvis[2] +/- CXR[3]
Discharge after 5 years after surgery	
***High risk*[1]**	
Years 1 - 2	- 3 monthly clinical examination and CT abdo/pelvis[2] +/- CXR[3]
Years 3 - 4	- 6 monthly clinical examination and CT abdo/pelvis[2] +/- CXR[3]
Years 5 -10	- annual clinical examination - annual CT abdo/pelvis[2] +/- CXR[3] year 5, then stop
Discharge at 10 years after surgery	
Adjuvant imatinib	
Years 1 - 5	- 6 monthly clinical examination and CT abdo/pelvis[2] +/- CXR[3]
Years 6 - 10	- annual clinical examination and CT abdo/pelvis[2] +/- CXR[3]
Discharge at 10 years after surgery	
2. Post-resection of localised disease following neo-adjuvant imatinib	As for high risk resected patients (above)
Discharge at 10 years	
3. Metastatic disease	
Years 1 - 3	- 3 monthly clinic review and CT chest/abdo/pelvis[2,3, 4]
Year 4 onwards	- 3 monthly clinic review - 6 monthly CT chest/abdo/pelvis[2,3, 4]

† **Patients treated within clinical trials should be followed up according to the trial protocol.**

[1] Risk grouping as defined in: Miettinen M, Lasota J. Semin Diagn Pathol. 2006 May;23(2):70-83

[2] CT may be replaced by MRI at clinician's discretion

[3] CXR may be replaced by CT chest for syndromic and paediatric GIST

4 CT chest may be replaced by CXR at clinician's discretion