**Benign tumors of the bone**  
**SI (latent or inactive)**- true capsule with normal and mature tissue  
- well-defined margin is seen on plain radiographs  
- generally, don’t need treatement (unless surgery is needed for decompression or stabilization)  
 - hemangioma  
 - monostotic fibrous dysplasia  
  
**SII (active stage)**  
- mild symptoms and slow growth  
- positive bone scan  
- can slightly expand the vertebrae  
- true capsule is thin  
- surrounded by pseudocapsule (made of compressed and degenerative tissue reactive to the tumor)  
- benign, active tumors do not leave their bony vertebral compartments to invade adjacent compartments  
- treated with intralesional excision or curettage with low rates of recurrence  
 - some osteoblastomas  
 - giant cell tumors  
  
**SIII (aggressive)**  
- no true capsule  
- tumor possesses digitations that protrude to the outside of, into, or through a thick reactive hypervascularized pseudocapsule  
- not confined to the vertebral compartment of origin and invade the neighboring compartments of muscle or epidural space  
- positive bone scan with fuzzy limits on plain radiographs  
- aggressive marginal en bloc excision is necessary for treatment because the risk of recurrence is considerable when intralesional curettage   
 alone is performed  
- adjuvant therapy (embolization and cement or radiation therapy) must be considered  
 - some osteoblastomas  
 - giant cell tumors  
 - aneurysmal bone cysts

**Malignant tumors of the bone**

**Low grade (I)**- No true capsule, but a thick pseudocapsule of reactive tissue often penetrated by small microscopic island of tumor  
- Difference between aggressive benign and low grade malignant is the potential for satellite lesions within the pseudocapsule  
- treatment is wide enbloc excision with adjuvant radiation to reduce the risk of recurrence **- Stage IA:** tumor remains inside the vertebra **- Stage IB:** low-grade tumor with extension into the paravertebral compartments

**High grade (II)**  
**-** growth is so fast that host has little time to form a continuous reactive tissue layer  
- **Stage IIA:** high grade malignancies that remain intracompartmental within in the vertebra  
- **Stage IIB:** extend outside the vertebral area into the extracompartmental paravertebral region; seeding with neoplastic nodules or satellites  
 - skip lesions present at some distance from the main tumor mass  
 - rapid expansion, particularly by small cell tumors, can occur in the epidural space  
 - osteosarcoma  
 - Ewing’s sarcoma

**Distant metastases (III)**- same lesions as in Stages I and II, but with distant metastasis

**Primary Surgical Classification of the Vertebral Tumors**Vertebral body is divided into 5 parts:   
**1.** Body **2**. Pedicle **3.** Lamina and spinous process **4.** Epidural canal **5.** Paravertebral area   
- intracompartmental lesions: 1, 2, 3   
- extracompartmental lesions: 4, 5, 6