**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