



# Diagnosis and Treatment of Patients with Primary and Metastatic Breast Cancer



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Guidelines Breast  
Version 2009.1.0

## Bone Metastases and Osteoporosis



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# Bone Metastases

- **Version 2002:**  
**Dall / Fersis / Friedrich**
- **Version 2003–2008:**  
**Bischoff / Böhme / Brunnert / Diel /  
Friedrichs / Maas / Oberhoff / Schaller /  
Seegenschmiedt / Souchon**
- **Version 2009:**  
**Solomayer / Schaller**

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Information

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# Bisphosphonates in Breast Cancer

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	Oxford / AGO LoE / GR		
➤ <b>Hypercalcemia</b>	1a	A	++
➤ <b>Reduction skeletal events (complications)</b>	1a	A	++
➤ <b>Treatment beyond progression of bone met's</b>	5	D	++
➤ <b>Prevention of bone metastases</b>			
➤ <b>Primary breast cancer</b>	1b	B	+*
➤ <b>Advanced breast cancer</b>	2b	C	+/-
➤ <b>Tumor Therapy-Induced Osteoporosis</b>			
➤ <b>Prevention</b>	1b	B	++
➤ <b>Therapy</b>	1b	B	++
➤ <b>Prevention and Therapy of Tumor Therapy-Induced Bone Loss</b>	1b	B	+

\* Study participation recommended

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# Skeletal Metastasis

## Treatment with Radionuclids

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- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>➤ <b>Tumor progression after standard treatment of multiple / disseminated metastases and intolerable bone pain</b></li> <li style="margin-left: 20px;">➤ <b><sup>186</sup>Rhenium-hydroxyethylidene-diphosphonat (z.B. <sup>186</sup>Re-HEDP)</b></li> <li style="margin-left: 20px;">➤ <b><sup>153</sup>Samarium</b></li> <li style="margin-left: 20px;">➤ <b><sup>89</sup>Strontium (z.B. Sr<sup>89</sup>)</b></li> </ul> | <p><b>1b B +</b></p> <p><b>2b B +</b></p> <p><b>1b B +</b></p> <p><b>1b B +</b></p> |
|---|---|

**Cave: Myelosuppression with risks of pancytopenia has to balance potential benefits.**

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# Bone Metastases

## Acute Spinal Cord Compression / Paraplegia

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- **Decompression surgery, reduction of tumor volume, stabilisation surgery (< 24 h) and irradiation of the spine (RT)** **2b C ++**
- **Irradiation of the spine (< 24 h) +/- steroids** **3b C ++**
- **Immediate start of treatment** **1c D ++**

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**Clinical trials have included patients with different tumor entities!**

# Prognostic Factors – Outcome of Spinal Cord Compression

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**Oxford LoE: 2b**

**GR: B**

- **Mobility before therapy**
- **Time interval from onset of neurological symptoms and start of therapy**

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References

**Rades et al, Prognostic factors predicting functional outcomes, recurrence-free Survival, and overall survival after radiotherapy for metastatic spinal cord compression in breast cancer patients. Int J Radiat Oncol Biol Phys 2006; 64: 182-188**

# Metastatic Bone Disease of the Spine

## Indications for surgery

**Oxford LoE: 2b**

**GR: C**

**AGO: ++**

- **Spinal cord compression**
  - **With progressive neurological symptoms**
  - **With pathological fractures**
- **Instability of the spine**
- **Lesions in pre-irradiated parts of the spine**

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# Surgery for Bone Metastases

## Spine and limbs

**Oxford LoE: 3b**

**GR: C**

**AGO: ++**

- **Marrow splints**
- **Osteosynthesis**
- **Bone replacement by PMMA or titanspacer**
- **Endoprothesis**
- **Vertebroplasty / Kyphoplasty**
- **Resection of involved bone in oligometastatic disease (sternum, ribs, vertebral bodies)**

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# Metastatic Bone Disease: Radiotherapy

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## Bone metastases

	<b>Oxford / AGO LoE / GR</b>
➤ <b>With fracture risk</b>	<b>1a B ++</b>
➤ <b>With functional impairment</b>	<b>1a B ++</b>
➤ <b>With bone pain</b>	<b>1a B ++</b>
➤ <b>Single RT = fractionated RT</b>	<b>2a B ++</b>
➤ <b>With neuropathic bone pain</b>	<b>1b B ++</b>
➤ <b>Asymptomatic isolated bone metastases</b>	<b>5 D +/-</b>

**Only few studies included breast cancer patients!**

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# Metastatic Bone Disease

## Recurrent Bone Pain

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### Recurrent bone pain in pre-irradiated parts of the skeleton

- |                                       |           |          |           |
|---------------------------------------|-----------|----------|-----------|
| ➤ <b>Single RT (1 x 8 gy)</b>         | <b>3b</b> | <b>C</b> | <b>++</b> |
| ➤ <b>Fractionated RT (6 x 4 gy) !</b> | <b>3b</b> | <b>C</b> | <b>+</b>  |
| ➤ <b>Radionuclid therapy</b>          | <b>3b</b> | <b>C</b> | <b>+</b>  |

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# Prevention and Therapy of Tumor Therapy-Induced Bone Loss

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➤ <b>Regular BMD-measurement recommended</b>	<b>2b</b>	<b>B</b>	<b>+</b>
➤ <b>Bisphosphonates</b>	<b>1b</b>	<b>B</b>	<b>+</b>
➤ <b>RANK-ligand antibody</b>	<b>2b</b>	<b>B</b>	<b>+</b>
➤ <b>HRT (independent from ER-status of BC)</b>	<b>5</b>	<b>D</b>	<b>-</b>
<b>Some data derived from steroid induced bone loss*:</b>			
➤ <b>Physical activity</b>	<b>4</b>	<b>C</b>	<b>++</b>
➤ <b>Calcium and vitamine D suppl.</b>	<b>4</b>	<b>C</b>	<b>++</b>
➤ <b>Avoiding BMI &lt; 18</b>	<b>3b</b>	<b>C</b>	<b>++</b>

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# Prevention of Tumor Therapy-Induced Osteoporosis

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- **Regular BMD-measurement recommended** **2b B +**
- **Bisphosphonates** **1b B ++**
- **HRT (independent from ER-status of BC)** **5 D -**

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# Therapy of Tumor Therapy-induced Osteoporosis

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- |   |           |          |           |
|---|-----------|----------|-----------|
| ➤ <b>Bisphosphonates</b>                        | <b>1b</b> | <b>B</b> | <b>++</b> |
| ➤ <b>HRT (independent from ER-status of BC)</b> | <b>5</b>  | <b>D</b> | <b>-</b>  |

**Some data derived from steroid induced bone loss\*:**

- |  |           |          |           |
|--|-----------|----------|-----------|
| ➤ <b>Physical activity</b>             | <b>4</b>  | <b>C</b> | <b>++</b> |
| ➤ <b>Calcium and vitamine D suppl.</b> | <b>4</b>  | <b>C</b> | <b>++</b> |
| ➤ <b>Avoiding BMI &lt; 18</b>          | <b>3b</b> | <b>C</b> | <b>++</b> |

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# Bisphosphonates For Therapy of Bone Metastases



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➤ <b>Clodronate PO 1600 mg daily</b>	<b>2b B ++</b>
➤ <b>Clodronate IV 1500 mg q3w / q4w</b>	<b>2b B ++</b>
➤ <b>Pamidronate IV 90 mg q3w / q4w</b>	<b>2b B ++</b>
➤ <b>Ibandronate IV 6 mg q3w / q4w</b>	<b>2b B ++</b>
➤ <b>Ibandronate PO 50 mg daily</b>	<b>2b B ++</b>
➤ <b>Zoledronate IV 4 mg q4w</b>	<b>2b B ++</b>
➤ <b>Other doses or schedules, e.g. derived from studies of adjuvant therapy or therapy of osteoporosis</b>	<b>5 D - -</b>

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