Author Year Country Research Design Score Total Sample Size	Methods	Results
Alendronate		
Ploumis et al. 2015 USA Prospective Controlled Trial N=299	**Population:** *Alendronate (ALN, N=125*): Mean age: 40.6 yr; Gender: males=86, females=39. *Non-ALN (N=174):* Mean age: 44.2 yr; Gender: males=140, females=34. **Intervention:** 70 mg ALN was prescribed weekly to patients who could tolerate sitting in an upright position and able to receive oral medications. Patients used ALN for a mean period of 267 days. **Outcome Measures:** Documentation and presence of HO.	1. No significant correlation between diagnosis of HO and ALN intake was found. 2. A significant correlation was found between HO appearance and alkaline phosphate (ALP) serum abnormality ($p<0.001$). Further, normal ALP serum levels were significantly correlated with ALN intake ($p<0.05$) whilst abnormal ALP serum levels was significantly correlated with no ALN intake. 3. Significantly more patients receiving ALN developed contractures ($p<0.001$).
Etidronate		
Banovac et al. 1997 USA Prospective Controlled Trial N=46	**Population:** Age range: 16-55 yr; Gender: males=44, females=2; Injury etiology: SCI=46; Severity of injury: AIS: A-C; Time since injury range: 2-5 wk. **Intervention:** 3 hr IV Etidronate Disodium on day of HO diagnosis and continued for 3 successive days followed by PO Etidronate for 6 mo. **Outcome Measures:** Degree of HO.	1. Group 1 (positive bone scan and negative x-ray for HO, n=33): five patients discontinued therapy and showed gradual development of HO; of the remaining 28 patients, 22 had no x-ray evidence of HO while 6 developed x-ray diagnosis of HO by follow-up. 2. Group 2 (positive bone scan and x-ray, n=13): 6 patients' progression of soft tissue ossification was inhibited by Etidronate Disodium while the remaining seven did not respond to treatment, and demonstrated further progression of HO.
Banovac et al. 1993 USA Prospective Controlled Trial N=27	**Population:** Age range: 15-64 yr; Gender: males=25, females=2; Injury etiology: SCI=27; Severity of injury: Frankel Class: A=15, B=12; Time since injury range: 2-6 wk. **Intervention:** 300mg IV Etidronate Disodium was administered over 3 hr for 3-5 days. After parenteral therapy, 20 mg PO Etidronate was administered for 6 mo. The second group received Etidronate PO only. **Outcome Measures:** Swelling.	1. After initial IV therapy, 20 patients showed prompt reduction in swelling over the first 48 hr, while seven patients had no change or an increase in swelling. 2. Overall, treatment reduced swelling ($p<0.01$). 3. No significant differences noted between the IV and orally treated groups in effect on HO.
Stover 1987 USA	**Population:** Age: >16 yr; Injury etiology: Acute SCI. **Intervention:** Didronel therapy. Four	1. There was no difference in development of HO between those receiving therapy for 3

Pre-Post $N_{Initial}$=169, N_{Final}=87	subgroups: 1) 3 mo therapy, early; 2) 6 mo therapy, early; 3) 3 mo therapy, late; 4) 6 mo therapy, late. **Outcome Measures:** X-ray of hips at baseline, post treatment and 1yr follow-up.	mo versus 6 mo. 2. Regardless of duration of Didronel, early treatment worked better than later treatment.
Banovac 2000 Denmark Case Series N=40	**Population:** Mean age: 23 yr; Gender: males=39, females=1; Injury etiology: SCI=40; Severity of injury: AIS A-B; Time since injury range: 2-5wk. **Intervention:** All patients with positive clinical findings and positive bone scan were treated with IV Etidronate Disodium, then PO Etidronate 20 mg/kg/day for 6 mo. **Outcome Measures:** Prevalence of HO.	1. No statistical results reported. 2. 11/40 patients developed radiographic evidence of HO from 1.5 to 6 yr post treatment. 3. In 95% of cases, recurrent HO in developed in different areas involving different joints.
Subbarao et al. 1987 USA Case Series N=5	**Population:** Age range: 29-41yr; Injury etiology: SCI; Time since injury range: 18-197 mo. **Intervention:** Didronel given 10 days-2 wk preoperatively, medication withheld for immediate postop period (72 hr) and continued for a minimum of 3 mo. All patients underwent wedge resection at hip to permit free movement of hip in flexion. **Outcome Measures:** Effects of treatment.	1. All patients at last follow-up were able to function independently in their wheelchairs except one, who was able to function independently in a semi reclining wheelchair. 2. Patients had severe restriction of range of motion in involved joints.
Garland et al. 1983 USA Case Series N=14	**Population:** Mean age=25 yr; Gender: males=9, females=5; Injury etiology: SCI; Level of injury: cervical=6, thoracic=5; Severity of injury: complete=7, incomplete=2. **Intervention:** Bisphosphonate treatment was administered for 2wk at 20 mg/kg/day and then for 2yr at 10 mg/kg/day. **Outcome Measures:** Effectiveness of treatment and adverse effects.	1. 8/9 pretreatment patients had HO in 10 hips. 2. Post-treatment all patients showed evidence of HO. 3. Of the 9 minimal graded hips, only 1 stayed at the minimal grade, whereas others increased (5 mild, 3 moderate, 5 severe). 4. No adverse effects were observed.
Pamidronate		
Schuetz et al. 2005 Switzerland Case Series N=7	**Population:** Age range: 47-68 yr; Gender: males=7, females=0; Injury etiology: SCI=7; Level of injury: thoracic=1, tetraplegia=2. **Intervention:** All patients underwent excision surgery for removal of HO. Pamidronate was administered IV peri-op and post-op, starting at a dose level of 120 mg for the first 12 hr, gradually increasing for a total of 6-14 days. **Outcome Measures:** Prevalence of HO.	No statistical results reported 1. None of the patients treated with pamidronate showed clinical, x-ray or lab signs of HO recurrence or new forming HO at 5-54 mo follow-up.