

	Rheumatic Manifestations of Endocrine Diseases
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	Disclosures
	<ul style="list-style-type: none"> ■ None

	When to search for an endocrinopathy?
	<ul style="list-style-type: none"> ■ A primary endocrine disorder may present with musculoskeletal manifestations ■ Carpal Tunnel Syndrome (DM, Hypothyroidism, Acromegaly) ■ Trigger Finger (DM, Hypothyroidism) ■ Myalgia (Hyper- or Hypothyroidism, Hyperparathyroidism) ■ CPPD (Hyperparathyroidism)

	Endocrine Diseases
	<ul style="list-style-type: none"> ■ Diabetes Mellitus ■ Thyroid Disorders Hypothyroidism Hyperthyroidism ■ Parathyroid disorders ■ Acromegaly ■ Cushing's Syndrome

	Diabetes
	<ul style="list-style-type: none"> ■ Carpal Tunnel Syndrome ■ DISH ■ Adhesive Capsulitis ■ Diabetic Cheiroarthropathy ■ Dupuytren's contracture ■ Neuropathic Arthropathy (Charcot joint) ■ Diabetic Amyotrophy

	Relative Incidences	
	Type 1 DM	Type 2 DM
	Carpal Tunnel	Carpal Tunnel
	Diabetic Cheiroarthropathy	Diabetic Cheiroarthropathy
	Dupuytren's	Dupuytren's
	Adhesive Capsulitis	Adhesive Capsulitis
	Charcot Joint	DISH
	Diabetic Amyotrophy	

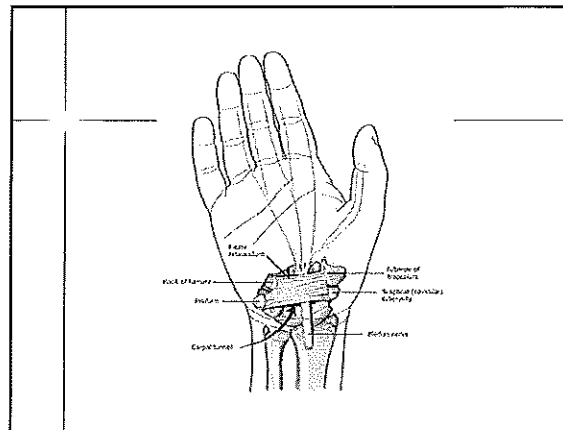
Carpal Tunnel Syndrome

Epidemiology

- Most common peripheral mononeuropathy
- Affects ~3% adults in the US
- 3 times more common in women
- Risk: Diabetes, Pregnancy, Thyroid d/o, CTD-RA, gout, CPPD, mechanical overuse

Pathology

- Median nerve compression by the flexor retinaculum at the wrist



Carpal Tunnel Syndrome

Symptoms: pain, numbness, weakness

- Night pain, often have to shake it out
- Numbness, commonly described in all fingers
- Pain and paresthesias may radiate to the forearm, elbow, and shoulder
- Periods of exacerbation and remission

Physical Examination

- Positive Tinel's (60/67), Phalen's (68/73)
- Decreased grip strength
- Late finding is thenar atrophy

Carpal Tunnel Syndrome

■ Tinel's

Phalen's

Carpal Tunnel Syndrome

Diagnosis

- Usually clinical based upon Hx/PE
- EMG/NCS diagnostic, rarely needed (prior to Sx), note that false negative rate up to 10%

Treatment

- Conservative: rest, wrist splint AM/PM, NSAIDs
- 80% success rate, but high relapse rate (80%)

Carpal Tunnel Syndrome


- Predicting the Outcome of Conservative Treatment for Carpal Tunnel Syndrome Score 1 point for each "yes" answer and zero for each "no" answer. See the scoring key for the predicted successful outcome of conservative treatment.

1. Have symptoms been present for more than 10 months?	Yes ___ No ___
2. Does the patient have constant paresthesias?	Yes ___ No ___
3. Does the patient have flexor tenosynovitis (Trigger finger)?	Yes ___ No ___
4. Is Phalen's maneuver positive within less than 30 seconds?	Yes ___ No ___
5. Is the patient older than 50 years?	Yes ___ No ___

■ SCORING KEY: zero points = 65% success rate; 1 point = 41.4% success rate; 2 points = 16.7% success rate; 3 points = 6.8% success rate; 4 or 5 points = 0% success rate.

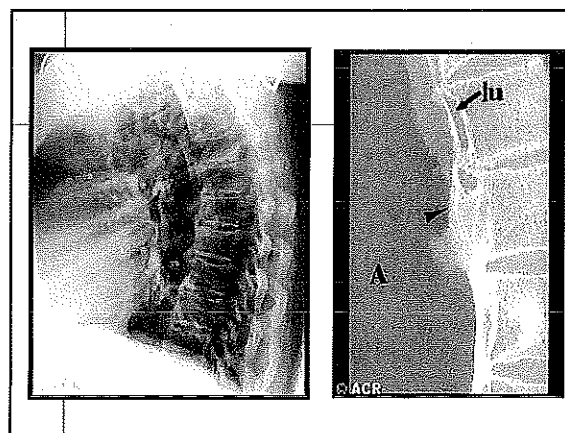
■ *Outcome rates are based on the use of wrist splinting and nonsteroidal anti-inflammatory drugs; success rates may be higher with oral corticosteroid therapy or local corticosteroid injection.

Kojan SJ, Girdell SJ, Erben RG. Predictive factors in the non-surgical treatment of carpal tunnel syndrome. J Hand Surg [Br]. 1996;19:109.

Carpal Tunnel Syndrome
<p style="text-align: center;">Treatment</p> <ul style="list-style-type: none"> ■ Oral Steroids- 20mg-1 wk, 10mg-1 wk, more effective than NSAIDS ■ Steroid Injection- 15-20mg ■ Ultrasound therapy ■ Yoga ■ Carpal Tunnel Release Surgery indicated if failure of conservative tx, intractable symptoms, or muscle weakness and atrophy (sustained relief) 

Diabetes
<ul style="list-style-type: none"> ■ Carpal Tunnel syndrome ■ DISH ■ Adhesive Capsulitis ■ Diabetic Cheiroarthropathy ■ Dupuytren's contracture ■ Neuropathic Arthropathy (Charcot joint) ■ Diabetic Amyotrophy

Diffuse Idiopathic Skeletal Hyperostosis (DISH)
<ul style="list-style-type: none"> ■ Forestier's disease, Ankylosing hyperostosis ■ 12% of geriatric population ■ Bone forming condition with ossification of skeletal sites subjected to stress ■ Increased insulin or GH -> increased IGF-1 -> increased osteoblast proliferation ■ Most frequently in thoracic spine ■ Can be asymptomatic or result in pain, stiffness, decreased range of motion in the spine ■ Dysphagia if involvement of cervical spine



DISH
<ul style="list-style-type: none"> ■ See "flowing" ossification of anterior longitudinal ligament in at least 4 contiguous vertebrae ■ Treatment is similar to OA Tylenol, NSAIDs, pain control, PT

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Adhesive Capsulitis

- AKA frozen shoulder
- Very, very common- 10-33% diabetics
- Diffuse soreness and global loss ROM
- Up to 50% have bilateral involvement
- Usually self-limited condition, but full recovery may take 6-18 months
- Less than 10% pt have long-term problems

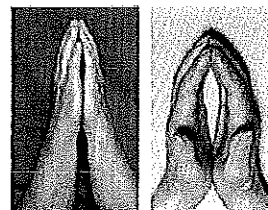
Adhesive Capsulitis

- Clinical diagnosis: at least 50% reduction in both passive/active ROM
- Labs and x-rays unremarkable
- MRI- can see thickening of glenohumeral joint capsule and synovium
- Tx is NSAIDs and intensive PT, occasionally intraarticular injections

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Diabetic Cheiroarthropathy



Diabetic Cheiroarthropathy

- See insidious development of flexion contractures of the hands
- Starts with the DIPs and moves proximal to involve the PIPs
- Due to excessive glycosylation of dermal collagen and collagen crosslinks
- Thick, waxy skin can mimic scleroderma
- Treatment: DM control and PT

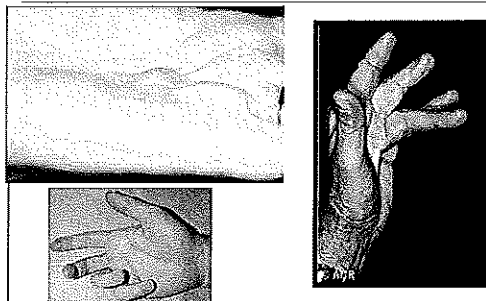
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Dupuytren's contracture

- Chronic thickening of palmar aponeurosis
- Fibrosis of the palmar fascia
- Leads to flexion deformities of 3rd and 4th digits

Dupuytren's contracture

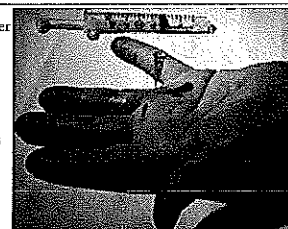


Flexor Tenosynovitis

- Occurs in 5-33% diabetics
- Can result in a "trigger finger"
- Inflammation of the tendon sheath, tendon gets stuck at the proximal A1 pulley at the base of the finger
- Therapy: conservative initially, followed by steroid injections, surgery

Flexor Tenosynovitis

proximal volar crease of the finger
 distal volar crease thumb
 in the midline
 Ethyl chloride
 A 5/8 inch 25 gauge needle
 inserted to a depth of 1/4 to 3/8
 1/2 mL of lidocaine is injected
 20mg dexamethasone



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Neuropathic Arthropathy

- Diabetes replaced syphilis as the #1 cause
- Occurs in 1/700 diabetics
- Commonly affects foot and ankle
- Etiology: lack of proprioception, vasomotor changes, pro-inflammatory cytokines
- Loss of sensation to a joint may result in a chronic, progressive, and destructive arthropathy

	<h3>Neuropathic Arthropathy</h3>
	<ul style="list-style-type: none"> ■ Sudden onset or episodes of unilateral warmth, redness and edema over foot or ankle, often with a history of minor trauma ■ Recurrent acute attacks may occur ■ Collapse of the arch of the midfoot ■ Bilateral about 20 percent of cases ■ Arthropathy is relatively painless

	<h3>Neuropathic Arthropathy</h3>

	<h3>Neuropathic Arthropathy</h3>
	<ul style="list-style-type: none"> ■ Diagnosis: r/o infection ■ Xrays: <ul style="list-style-type: none"> – Early: soft tissue swelling, osteopenia, loss of joint space – Later: destruction with osteolysis and “pencil-pointing” of phalanges, increased density, debris, disorganization, dislocation ■ Can have midtarsal collapse

	<h3>Neuropathic Arthropathy</h3>
	<ul style="list-style-type: none"> ■ Treatment: <ul style="list-style-type: none"> protected weight bearing soft casting protective shoes surgery rarely needed

	<h3>Neuropathic Arthropathy</h3>
	<ul style="list-style-type: none"> ■ Preliminary promising data with bisphosphonates ■ 39 patients randomized to one-time IV pamidronate versus placebo ■ Resulted in significant symptomatic improvement over 12 months observation ■ Jude, EB, Selby, PL, Burgess, J, et al. Bisphosphonates in the treatment of Charcot neuroarthropathy: a double-blind randomised controlled trial. <i>Diabetologia</i> 2001; 44:2032.

	<h3>Neuropathic Arthropathy</h3>
	<ul style="list-style-type: none"> ■ Similar results with oral bisphosphonates ■ 6 month trial of fosamax weekly in acute charcot joint in 11 pt, vs placebo in 9 ■ After 6 mo, significant reduction in markers of bone turnover, improvement in total foot mineralization, significantly decreased pain ■ Pitocco, D, Ruotolo, V, Caputo, S, et al. Six-month treatment with alendronate in acute Charcot neuroarthropathy: a randomized controlled trial. <i>Diabetes Care</i> 2005; 28:1214.

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Diabetic Amyotrophy	
	<ul style="list-style-type: none"> ■ Rare syndrome of diabetic muscle infarction ■ Poorly controlled and longstanding DM ■ More common in Type 1 DM ■ Etiology unclear: acute femoral mononeuritis or inflammatory vasculopathy ■ Presents with severe pain, swelling in the proximal muscles of thigh and pelvis

Diabetic Amyotrophy	
	<ul style="list-style-type: none"> ■ Lab: CK nl or increased, leukocytosis, elevated ESR ■ EMG/NCS: see neuropathic changes ■ Muscle biopsy: see muscle fiber necrosis, microvasculopathy ■ Tx: Aspirin, NSAIDs ■ Prognosis: resolves spontaneously in most, however recovery incomplete, can recur

Endocrine Diseases	
	<ul style="list-style-type: none"> ■ Diabetes Mellitus ■ Thyroid Disorders <li style="padding-left: 20px;">Hypothyroidism <li style="padding-left: 20px;">Hyperthyroidism ■ Parathyroid disorders ■ Acromegaly ■ Cushing's Syndrome

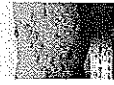


Thyroid Disorders	
Hypothyroidism	Hyperthyroidism
Arthralgias	Arthralgias
Myalgias	Myalgias
Proximal Muscle Weakness w/ elev CK	Proximal Muscle Weakness w/ nl CK
Carpal Tunnel Syndrome	
Myxedematous arthropathy	Thyroid acropachy

Hypothyroid Myopathy	
	<ul style="list-style-type: none"> ■ Muscle involvement in hypothyroidism is very common- cramps and myalgias to weakness ■ Proximal mm pain and/or weakness ■ Can resemble PMR or polymyositis ■ CK elevation occurs in 57-90% of pt with hypothyroidism, usually mild, <10x normal

Hypothyroid Myopathy	
	<ul style="list-style-type: none"> ■ Polymyositis-like picture with proximal mm weakness with severely elevated mm enzymes ■ Several case reports of Rhabdomyolysis ■ EMG may reveal myopathic picture ■ Biopsy usually non-inflammatory ■ Tx: w/ thyroid replacement CK levels normalize within weeks, S & S months, median time 5.5 mo

Myxedematous Arthropathy	
	<ul style="list-style-type: none"> ■ Associated with severe hypothyroidism ■ Present with swelling and stiffness of large joints, i.e. knees ■ Thick, gelatinous, extremely viscous fluid due to high content of hyaluronic acid, usually is non-inflammatory, may have CPPD crystals

Hyperthyroidism	
	<ul style="list-style-type: none"> ■ Arthralgias ■ Myalgias ■ Painless proximal mm weakness in 70%, usually nl CK ■ Osteoporosis ■ Pretibial Myxedema ■ Thyroid acropachy

Pretibial Myxedema	
	<ul style="list-style-type: none"> ■ Syndrome of painless nodules over pretibial areas ■ Lesions variable in size ■ Color ranges pink to purple ■ Can mimic E.N. <div style="display: flex; justify-content: space-around; align-items: center;">    </div>

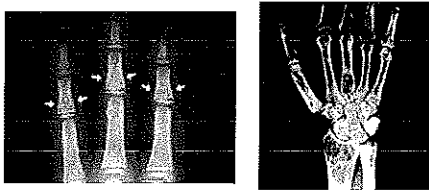
Thyroid Acropachy	
	<ul style="list-style-type: none"> ■ Rare, 1%, complication of pt with Grave's ■ Hand swelling, digital clubbing, onycholysis, pain ■ Almost always co-exists w/ ophthalmopathy and pretibial myxedema ■ Xrays: periostitis of metacarpal bones, can be asymmetric, very rarely in long bones ■ Tx: corticosteroids and systemic immunosuppressive therapy

Thyroid Medications	
	<ul style="list-style-type: none"> ■ Propylthiouracil: can result in a p-anca positive systemic vasculitis ■ 22 y/o female presented to Harbor with severe fatigue, SOB, found to have Hg 4 and b/l fluffy infiltrates ■ Methimazole: can result in a lupus-like syndrome

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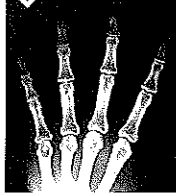
Primary Hyperparathyroidism	
	<ul style="list-style-type: none"> ■ Hyperuricemia and gout ■ Pseudogout ■ Proximal mm weakness with nl enzymes, with neuropathic picture on NCS, bx ■ Low bone mineral density ■ Increased vertebral fractures

Primary Hyperparathyroidism	
	<ul style="list-style-type: none"> ■ Osteitis fibrosa cystica- classic presentation ■ Subperiosteal bone resorption on the radial aspect of the middle phalanges ■ Diffuse osteopenia ■ Erosions, especially at the end of clavicles ■ Brown tumors- focal aggregates of osteoclastic giant cells, fibrous tissue, blood

Primary Hyperparathyroidism	
	

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Acromegaly	
	<ul style="list-style-type: none"> ■ Rare disorder characterized by elevated levels of growth hormone ■ Rheumatic problems frequently seen ■ DISH in seen in up to 20% patients ■ TMJ pain and malocclusion increased ■ Carpal Tunnel Syndrome in up to 1/2, frequently bilateral, usually responds to correction of dz, up to 18% need surgery

Acromegaly
<ul style="list-style-type: none"> ■ Early osteoarthritis due to acceleration of normal growth process (knee>hip>spine) ■ On x-rays see soft-tissue thickening and enlarged terminal phalynx (spade-like) 

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Cushing's Syndrome
<ul style="list-style-type: none"> ■ Osteoporosis ■ Osteonecrosis of bone ■ Proximal mm weakness w/o muscle enzyme elevations. Type 2b muscle atrophy seen on biopsy. ■ Note: #1 cause of Cushing's is iatrogenic, as more than 10 million people are on steroids

When to search for an endocrinopathy?
<ul style="list-style-type: none"> ■ A primary endocrine disorder may present with musculoskeletal manifestations <ul style="list-style-type: none"> ■ Carpal Tunnel Syndrome (DM, Hypothyroidism, Acromegaly) ■ Trigger Finger (DM, Hypothyroidism) ■ Myalgia (Hyper- or Hypothyroidism, Hyperparathyroidism) ■ CPPD (Hyperparathyroidism)

Labs to check...
<ul style="list-style-type: none"> ■ HgA1c ■ TSH ■ PTH ■ RF ■ Anti-CCP ■ ESR ■ CRP

That's All Folks!!!!!!