Clinical Aspects of Gout

ICD-9-CM Coordination
and
Maintenance Committee Meeting

September 24-25, 2008

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Gout: Ancient Pedigree with New Needs

- 2640 BC: podagra first identified by the Egyptians
  - 5th century BC: Hippocrates referred to gout as “unwalkable disease” and noted links between gout & lifestyle, demographics & other variables
- Why New Needs?
  1. Gout is currently a major and growing public health problem
  2. Available ICD-9-CM codes do not differentiate between several distinctly different clinical aspects of gout
     - There is need for accurate and clinically logical code characterization for primary & specialty clinicians alike
  3. Accurately coded database will allow us to
     - Improve documentation of the full spectrum of clinical aspects of gout and associated comorbidities
     - Prevent loss of critical patient information that adds to our ability positively impact outcomes in terms of patient QOL and disability, as well as to assess health economic implications of interventions

Nature of Gout

- Chronic heterogeneous disorder of urate metabolism
- Results in deposition of monosodium urate crystals in the joints and soft tissues, with accompanying inflammation and degenerative consequences
- Most common form of inflammatory joint disease in men aged ≥40 years
- This disorder can be progressive through four stages if undertreated

1. Asymptomatic hyperuricemia
2. Acute gout
3. Intercritical gout
4. Chronic tophaceous gout

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American College of Rheumatology.
ACR Clinical Slide Collection on the Rheumatic Diseases.
Atlanta, Ga.
American College of Rheumatology; 1998.

Hallmarks of Gout

- Group of conditions which may be characterized by
  - An elevation of serum uric acid (usually)
  - Recurrent attacks (flares) of an acute inflammatory arthritis with monosodium urate crystals demonstrated in synovial fluid leukocytes
  - Bone and joint destruction in some cases
  - Aggregates of uric acid crystals (tophi) in and around joints, soft tissues, and various organs
  - Tophus in bone leading to erosions in some cases
  - Kidney disease and stones

1. Image reprinted with permission. American College of Rheumatology. *ACR Clinical Slide Collection on the Rheumatic Diseases*. Atlanta, Ga.: American College of Rheumatology; 1998.
2. http://www.healthinplainenglish.com/health/musculoskeletal/gout/index.htm

Major Musculoskeletal Disorders in US

Persons in USA Affected by Common Rheumatologic Disorders

Frequent Low Back Pain
40.2 million in 2005, projected to increase to 48.6 million in 2025

Osteoarthritis
20.7 million in 2005, projected to increase to 28.1 million in 2025

Osteoporosis
3.8 million in 2005, projected to increase to 5.3 million in 2025

Gout
2.6 million in 2005, projected to increase to 3.6 million in 2025

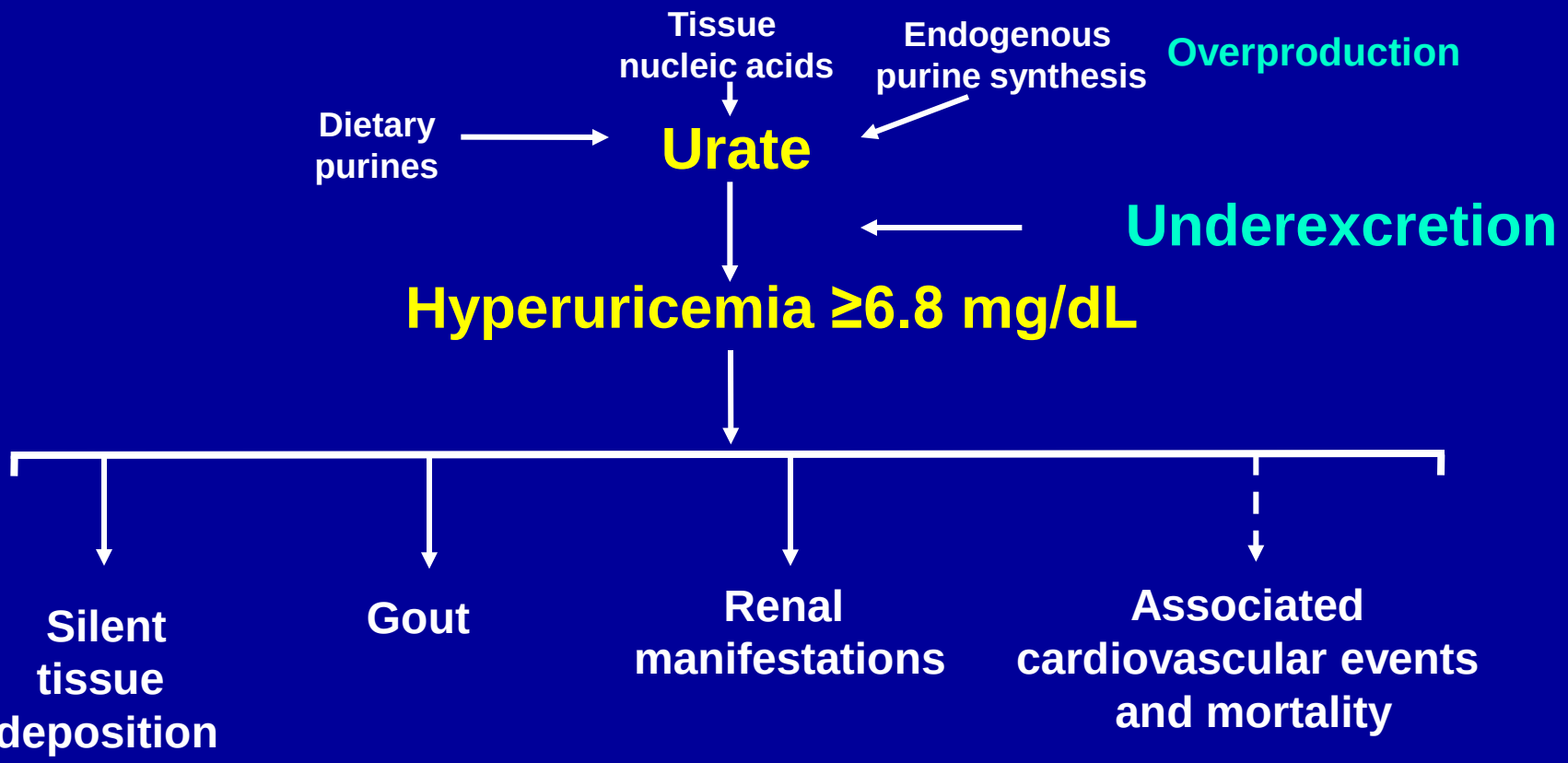
Rheumatoid Arthritis
2.1 million in 2005, projected to increase to 2.8 million in 2025

Adapted from The Lewin Group, Inc. Report to ACR 2006

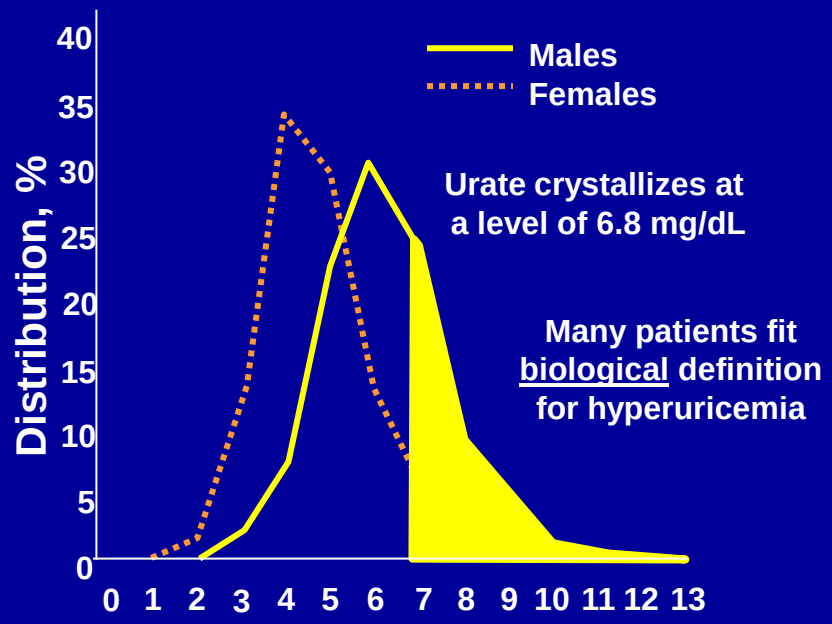
Hyperuricemia

Biologically significant hyperuricemia (≥6.8 mg/dL) is less than laboratory defined hyperuricemia (≥8.0 mg/dL)

The Hyperuricemia Cascade



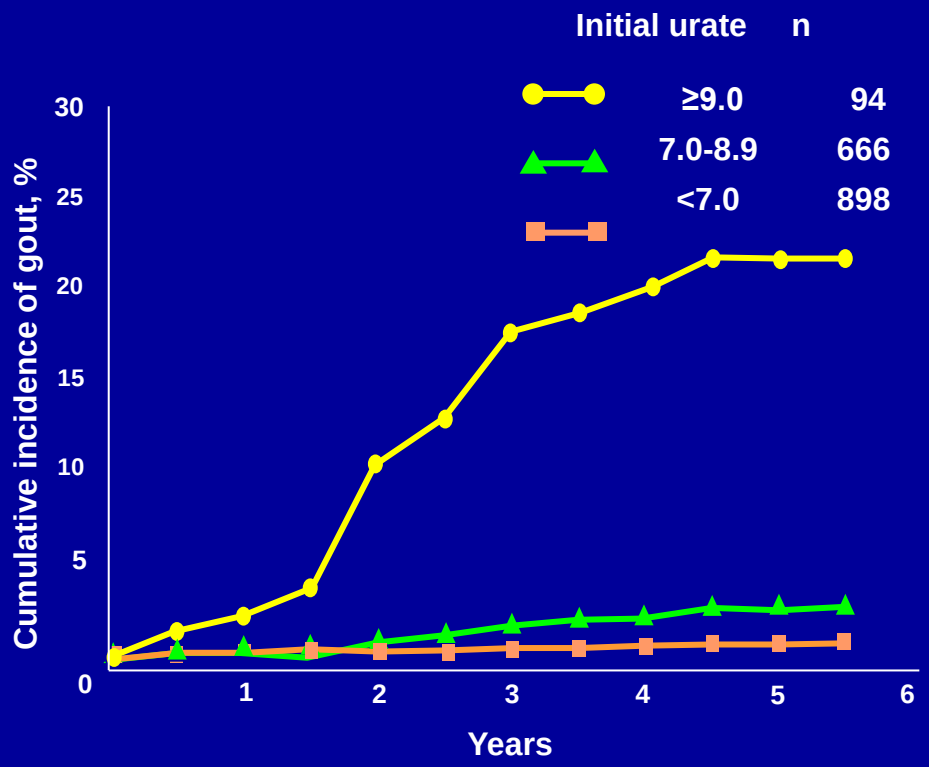
Hyperuricemia and Gout



Serum urate, mg/dL

Serum urate levels in 1515 men and 1670 women aged ≥30 in Taiwan 1991-1992

Lin et al. *J Rheumatol*. 2000;27:1045-1050.



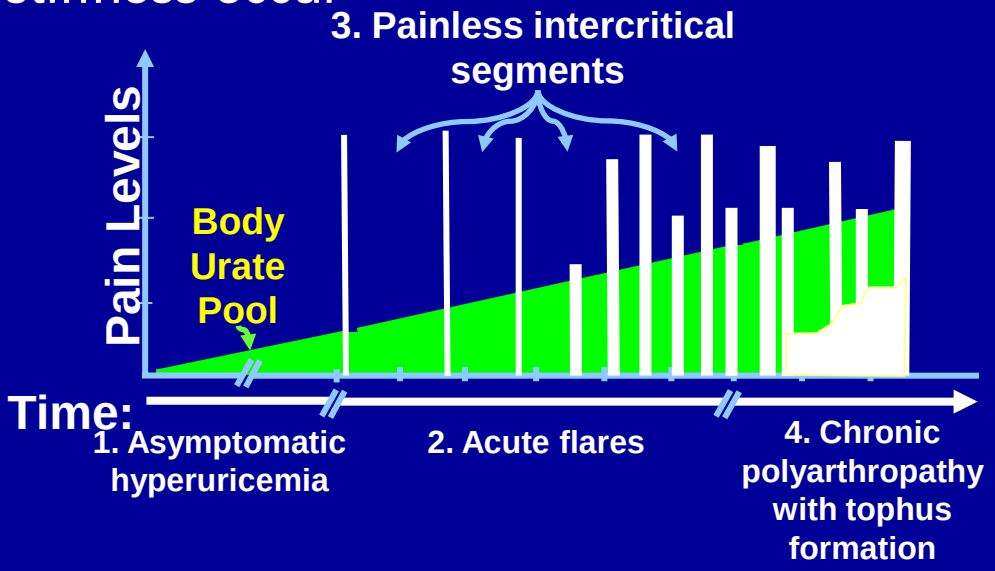
Over time, high serum urate levels lead to gout

Normative Aging Study:1858 previously healthy men (average initial age 42) followed for 14.9 years

Campion et al. *Am J Med*. 1987;82:421-426.

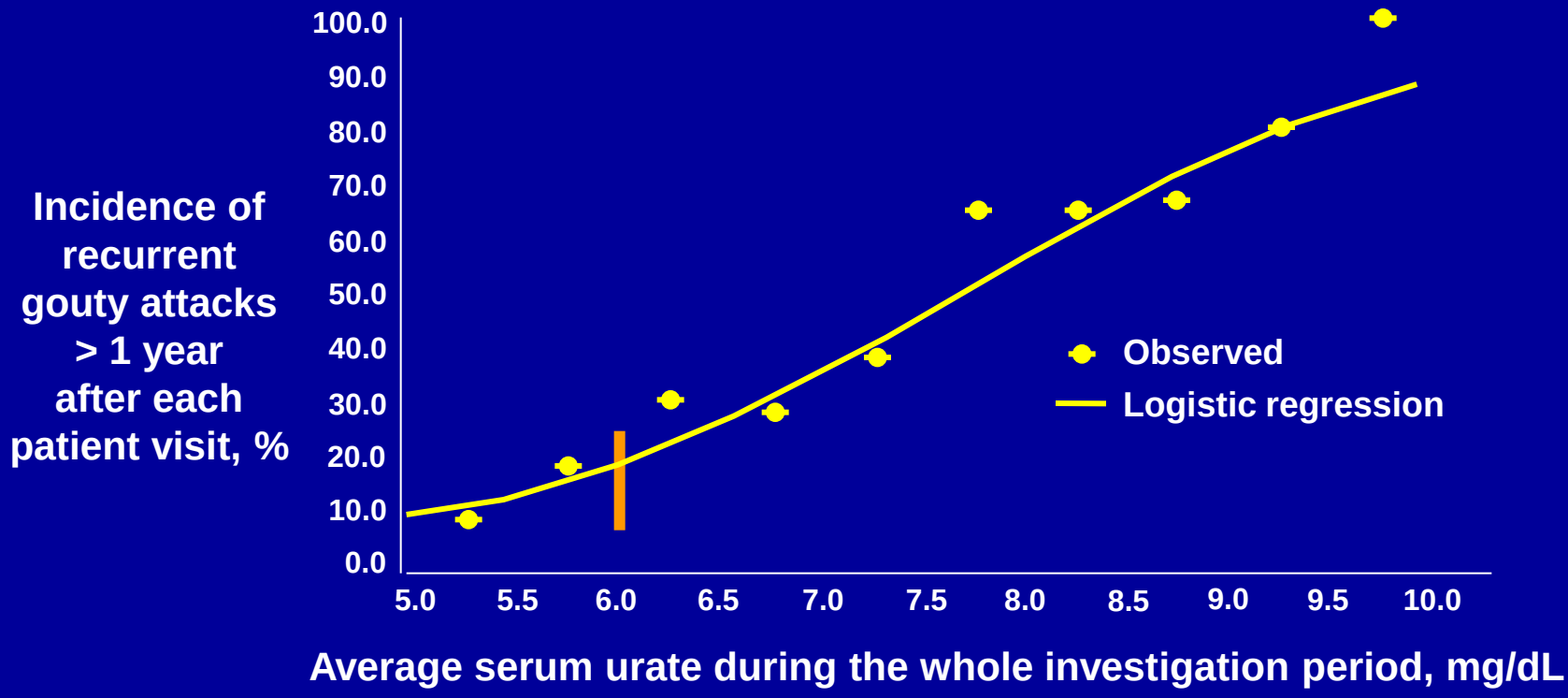
Evolution from Hyperuricemia to Gout

- Over time, untreated, chronic hyperuricemia increases body urate stores, advancing the severity of the disease
  - Flares last longer
  - Flares occur more often
  - Intercritical segments (flare free periods) decrease
  - Persistent pain and stiffness occur



Adapted from Klippel et al, eds. In: *Primer on the Rheumatic Diseases.* 12th ed. Arthritis Foundation; 2001:313.

Properly Lowering Serum Urate ↓s Acute Flares



- 86% (71/81) of patients who had serum urate <6.0 mg/dL did not experience an acute flare during the study period

Shoji et al. *Arthritis Care Res*. 2004;51:321-325.

Flare: Classic Description

The victim goes to bed and sleeps in good health. About two o'clock in the morning he is awakened by a severe pain in the great toe; more rarely in the heel, ankle, or instep. The pain is like that of a dislocation, and yet the parts feel as if cold water were poured over them . . . Now it is a violent stretching and tearing of the ligaments – now it is a gnawing pain, and now a pressure of tightening. So exquisite and lively meanwhile is the feeling of the part affected, that it cannot bear the weight of the bedclothes nor the jar of a person walking in the room. The night is spent in torture.

Sydenham, 1683

Sydenham, T: The Works of Thomas Sydenham, London, New Sydenham Soc. 1850 (translation)

Podagra

Image reprinted with permission. American College of Rheumatology. *ACR Clinical Slide Collection on the Rheumatic Diseases*. Atlanta, Ga.: American College of Rheumatology; 1998.

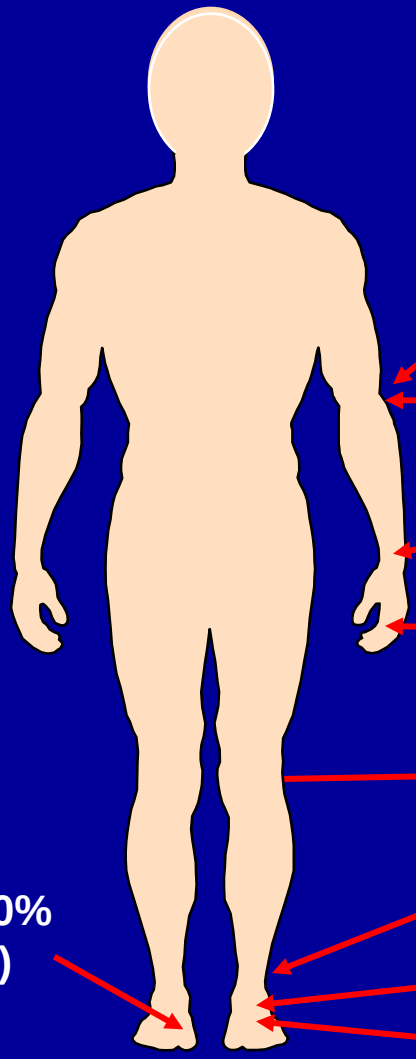
Flare: A Vet's Description

"I've been shot, beat up, stabbed and thrown out of a helicopter, but none of that compared to the gout."

Birmingham, Alabama
VA Hospital
March, 2001

Courtesy Kenneth Saag, M.D.

Common Sites of Acute Flares



Gout can occur in bursae, tendons, and joints

1st MTP (eventually affected in ~90% of individuals with gout)

Olecranon Bursa

Elbow

Wrist

Fingers

Knee

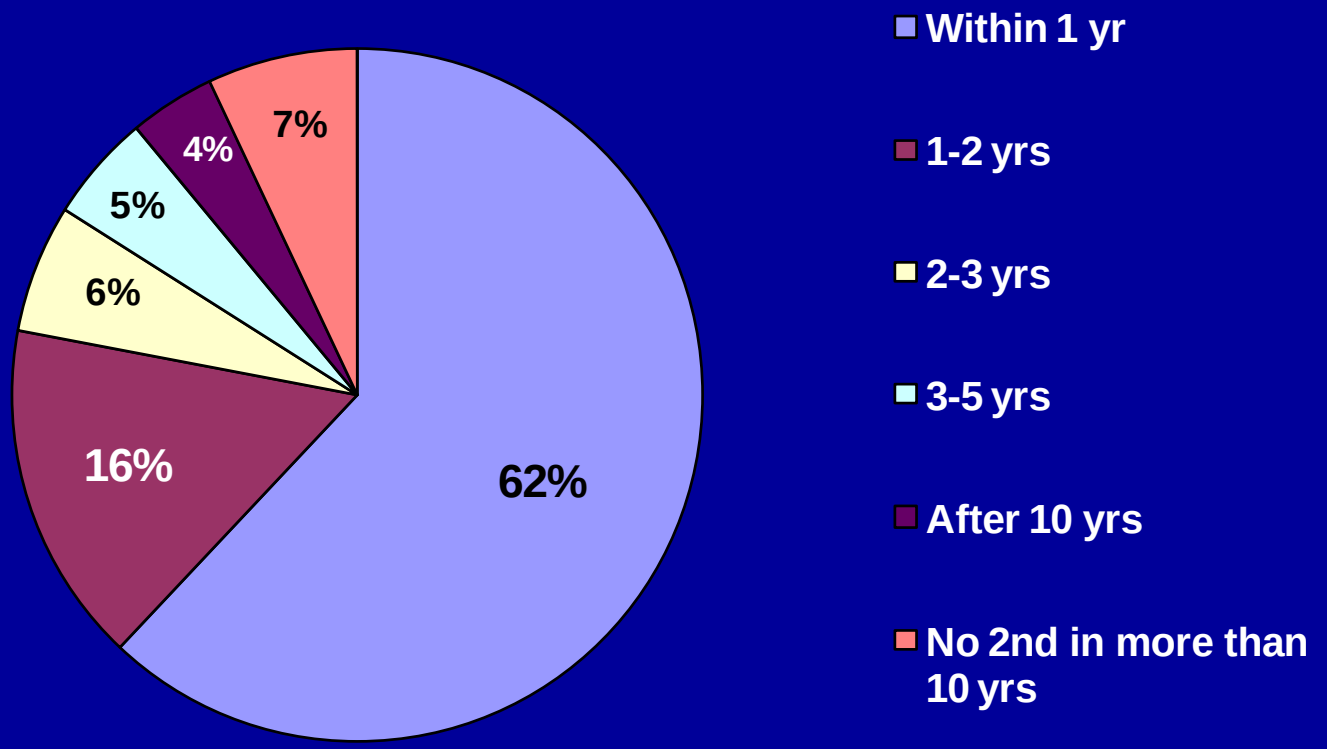
Ankle

Subtalar

Midfoot

Intervals Between 1st & 2nd Acute Flares

Majority experience second acute flare within 1 year of first gout flare



Yu et al. *Ann Int Med.* 1961;55:179-192

Advanced Chronic Tophaceous Gout

- Tophi can be seen clinically, with obvious deformity demonstrated in hands and foot
- Tophi may be associated with bony destruction as seen on the x-ray on right

Patient & Societal Burden

Patient

- ↓ QOL with gout progression
  - Worse QOL scores with >1 tophi vs no tophi; with SUA >10 vs <9.0 mg/dL[1]
- Inter-critical periods:
  - 25% report pain when not experiencing flare[1]
- Nearly half of all gout pts have either ACR Class II or III disability[3]
  - Difficulty in recreation & other QOL activities, but some will also have difficulty with even basic activities of daily living
- Higher rate of all-cause mortality in those with gout vs without[4]

Society

- Estimated 2.6 million (2005) with estimate of 3.6 million (2025)[2]
- $27.4 million = estimated annual direct cost for new cases of acute gout in US[5]
- Near doubling of claims cost for Rx, sick leave, short term disability and workman's comp in gout vs non-gout pts ($6970 vs $3705)[6]
- More absence days per year and lower mean annual productivity[6]

1. Osterhaus JT, et al. Presented at: 69th Annual Meeting of the American College of Rheumatology; 2005. San Diego.#1035.
2. The Lewin Group, Inc. Report to ACR 2006.
3. Alvarez-Nemegyei et al J Rheum. 2005.
4. Choi, Curhan Circ. 2007.
5. Kim Clin Ther. 2003.
6. Khanna D et al. Med Decis Making, 2008

Largely Non-Specialist Care

- The majority of individuals with gout are treated by primary care physicians, not specialists
- Many gout-related visits are based on acute exacerbations of the disease
- The diagnostic terms “acute gout” and “chronic gout” with and without “tophi” are commonly documented in primary care medical records

Distribution of Office Visits (1999-2003)

- **Frequent Low Back Pain**
  Rheumatologist (3%)
  Primary Care Provider or PCP (74%) Other (22%)
- **Osteoarthritis**
  Rheumatologist (7%)
  PCP (52%) Other (40%)
- **Osteoporosis**
  Rheumatologist (5%)
  PCP (79%) Other (15%)
- **Gout**
  Rheumatologist (12%)
  PCP (80%) Other (8%)
- **Rheumatoid Arthritis**
  Rheumatologist 52%)
  PCP (31%) Other (17%)

Adapted from The Lewin Group, Inc. Report to ACR 2006

Changing Treatment Landscape After Four Decades

Current

- Allopurinol
- Uricosurics
- Symptomatic relief

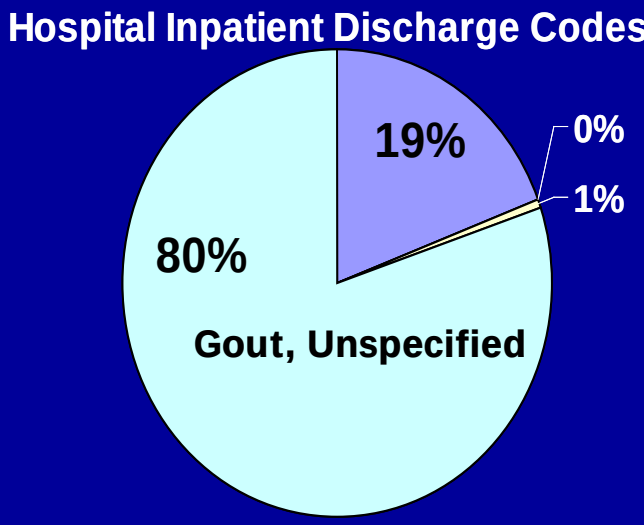
In Development

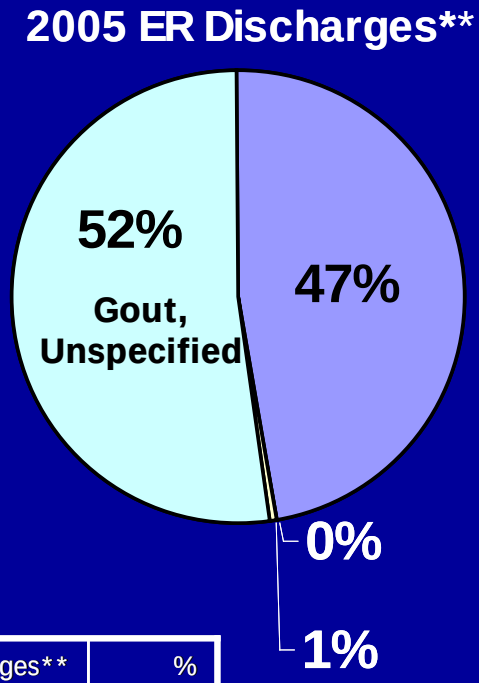
- Uricosurics
- Selective xanthine oxidase inhibitor
- Pegylated uricase enzyme
- IL-1 receptor antagonists
- URAT1 Transporter Inhibitor

IL-1 = Lnterleukin-1

URAT1 = urate transporter 1

Clinical Limitations of Current Code Characterization





Code	Hospital Discharges*	%	ER Discharges**	%
274.0 Gouty Arthropathy	94,041	19	29,777	47.2
274.1X Gouty Nephropathy	1,147	0.2	61	0.09
274.8X Gout with other specified manifestations	3,281	0.6	357	0.6
274.9 Gout, unspecified	397,763	80	32,874	52.1
Total	496,232	100	63,069	100

*All cases with 1º or 2º diagnosis of gout 274.0 to 274.9 **Only if not admitted & 274.0 to 274.9 was 1º diagnosis, i.e., reason for ER care http://hcupnet.ahrq.gov/

Limitations of Current Code Characterization

- Available ICD-9-CM codes do not differentiate between several distinctly different clinical aspects of gout
  - There is need for accurate and clinically logical code characterization for primary & specialty clinician alike
  - Current code structure can be confusing or unclear, leading to majority of diagnoses to be coded to 274.9 (Gout, unspecified)
- This leads to
  - Difficulty identifying different aspects of gout in encoded data
  - Inability to relate visits and treatment to specific stage of gout
  - Barriers in analysis of pt outcomes & determining intervention benefit
- Accurately coded database will allow us to
  - Improve documentation of the full spectrum of clinical aspects of gout and associated comorbidities (*e.g. renal/heart failure, metabolic syndrome, hypertension, cardiovascular disease, diabetes, obesity, hyperlipidemia)*
  - Prevent loss of critical patient information that compromises our ability to define outcomes in terms of patient QOL and disability, as well as to assess health economic implications of interventions

Refs: Vazquez-Mellado et al. Best Practice Res Clin Rheumatol. 2004.Nakanishi et al. Int J Epidemiol. 1999. Ford et al. JAMA. 2002. Boyko et al. Diabetes Care. 2000. Anker et al. Circulation. 2003. Gavin et al. Am J Cardiovasc Drugs. 2003. Niskanen et al. Arch Intern Med. 2004.Gagliardi Atheroscl 2008. Puig Curr Opin Rheum 2008. Ebrahimpour Endo Prac 2008. Choi Rheum 2008.