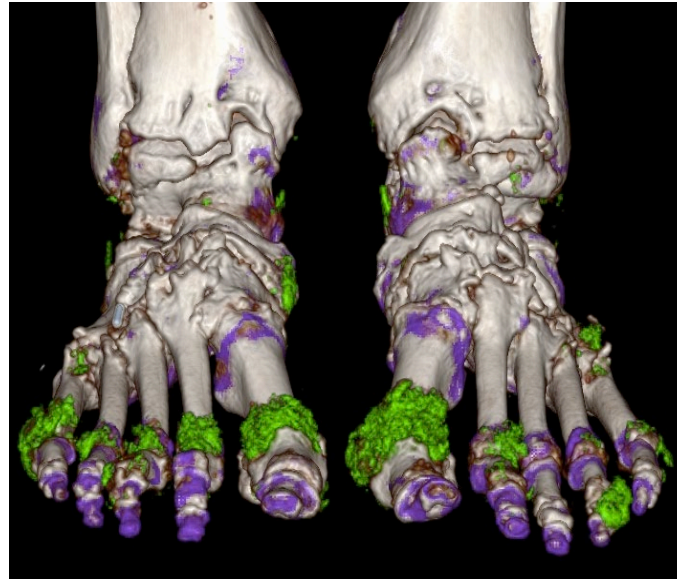


# Gout



Nicola Dalbeth

Rheumatologist and Professor

Auckland District Health Board and University of Auckland

# Gout and uric acid levels

- The most common inflammatory arthritis.  
In 2018, gout affected:
  - 8.8% in Māori adults
  - 14.4% in Pacific adults
  - 4.8% in NZ European adults
- Caused by the body's response to uric acid crystals
- Uric acid crystals form in the presence of high uric acid (urate) levels in the blood



# Crystals in the joints

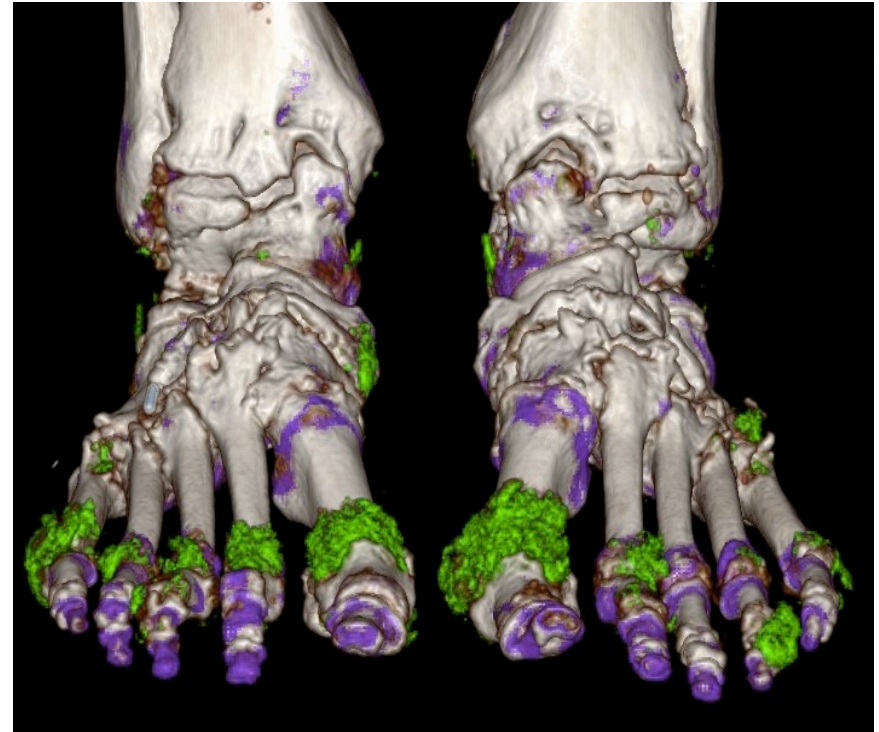
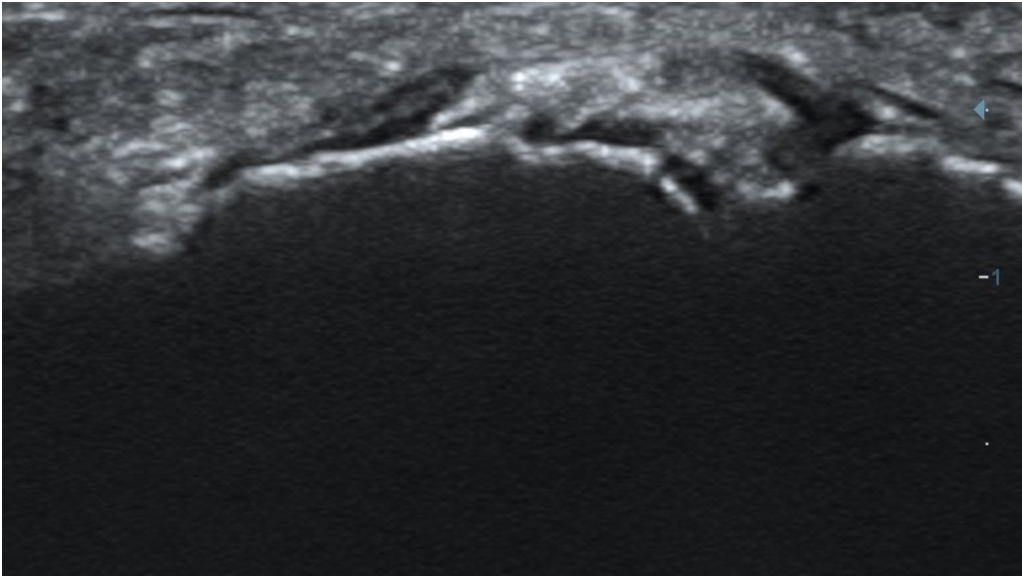
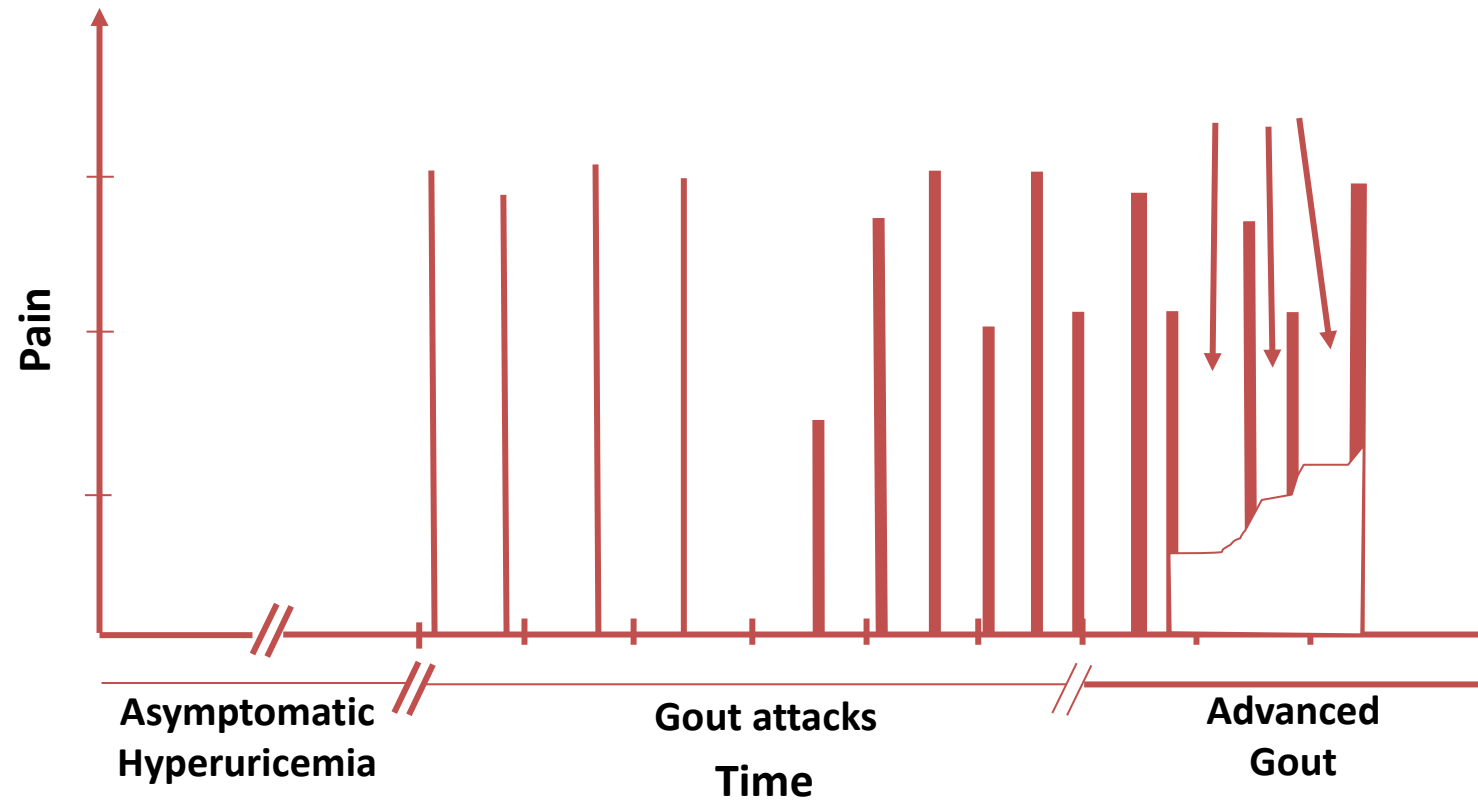


Image: Sivera *Therapeutic Advances in Musculoskeletal Disease* 2022

# Gout over time



# The gout attack

*“Well when I get it there is a lot of throbbing in the area, it just feels like the area that is inflamed, is cooking, I mean it is hot, a real hot sensation and then if it is real bad it feels like the flesh is trying to rip your outside you know its like it is going to burst you know your skin is stretching and it is going to rip because it is stretching too much that is sort of just how it sort of feels.”*





# Tophi: collections of uric acid crystals

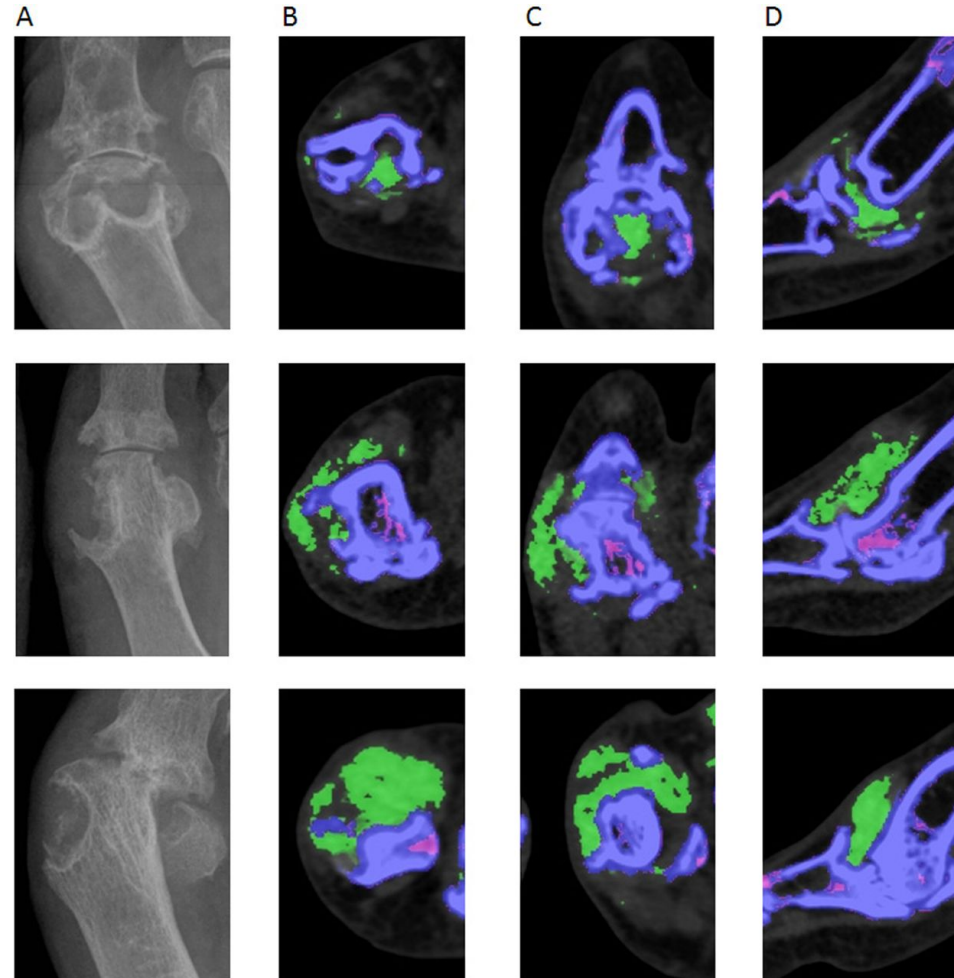


Image: ACR slide collection

# Chronic joint damage



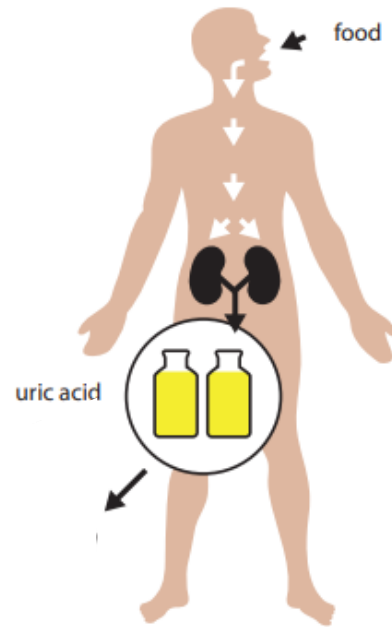
# Uric acid crystals cause joint damage in gout



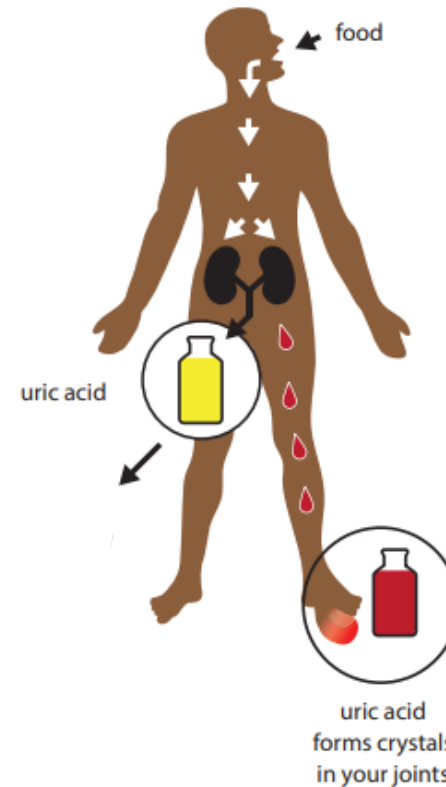


# Uric acid in the body

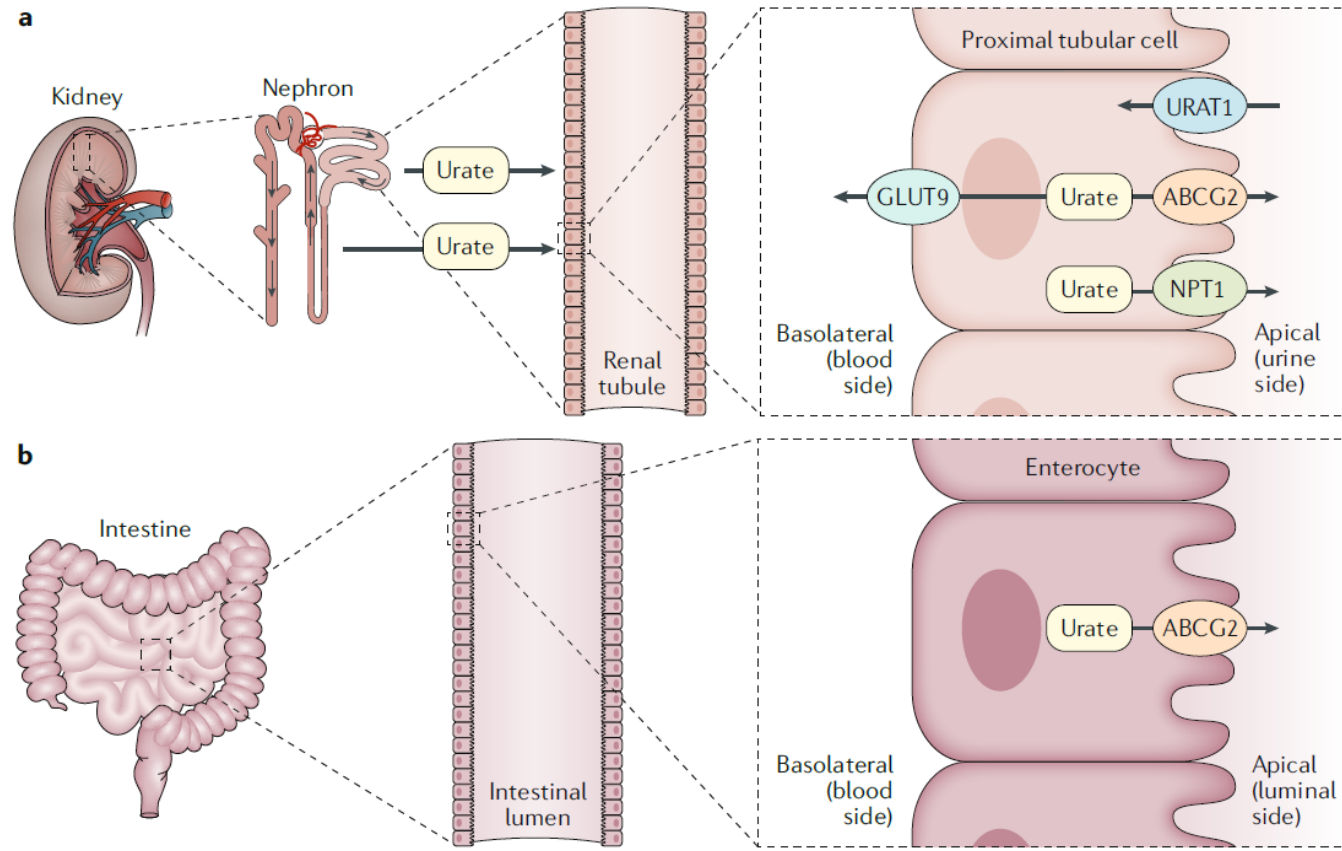
**Most people get rid  
of uric acid through  
their urine**



**Some people, including many  
Māori and Pacific people, get rid  
of some of their uric acid, and  
the rest stays in their blood**



# Uric acid in the body



# Dietary risk factors for gout: population studies

- Increased risk
  - Beer
  - Red meat
  - Seafood
  - Fructose
- Reduced risk
  - Low fat dairy
  - Coffee
  - Cherries
  - Vitamin C

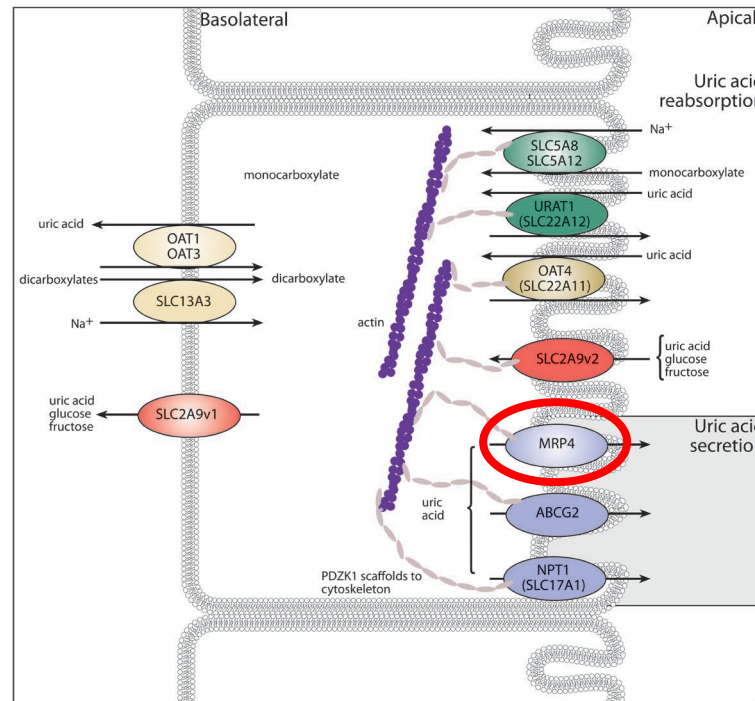


# Relative impact of dietary factors compared with genes on blood uric acid

- Diet scores (based on healthy diet guidelines) associated with serum uric acid levels, but explained  $\leq 0.3\%$  of variance in uric acid
- In contrast, 23.9% of variance in uric acid was explained by common genetic variants

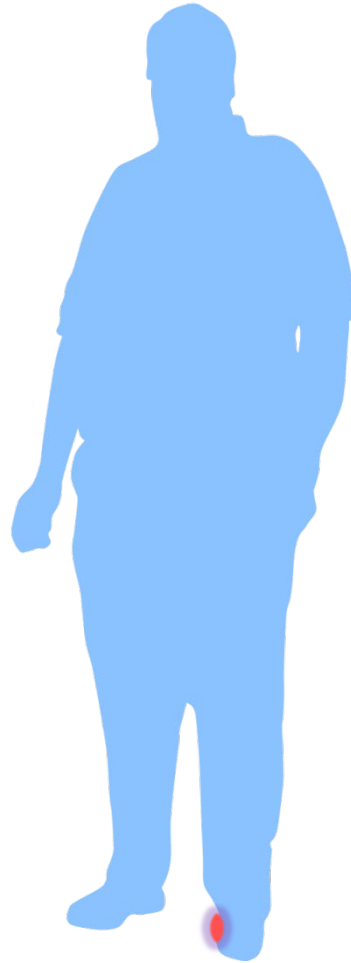
## Population-Specific Resequencing Associates the ATP-Binding Cassette Subfamily C Member 4 Gene With Gout in New Zealand Māori and Pacific Men

Callum Tanner,<sup>1</sup> James Boockock,<sup>1</sup> Eli A. Stahl,<sup>2</sup> Amanda Dobbyn,<sup>2</sup> Asim K. Mandal,<sup>3</sup> Murray Cadzow,<sup>1</sup> Amanda J. Phipps-Green,<sup>1</sup> Ruth K. Topless,<sup>1</sup> Jennie Harré Hindmarsh,<sup>4</sup> Lisa K. Stamp,<sup>5</sup> Nicola Dalbeth,<sup>6</sup> Hyon K. Choi,<sup>7</sup> David B. Mount,<sup>3</sup> and Tony R. Merriman<sup>1</sup>

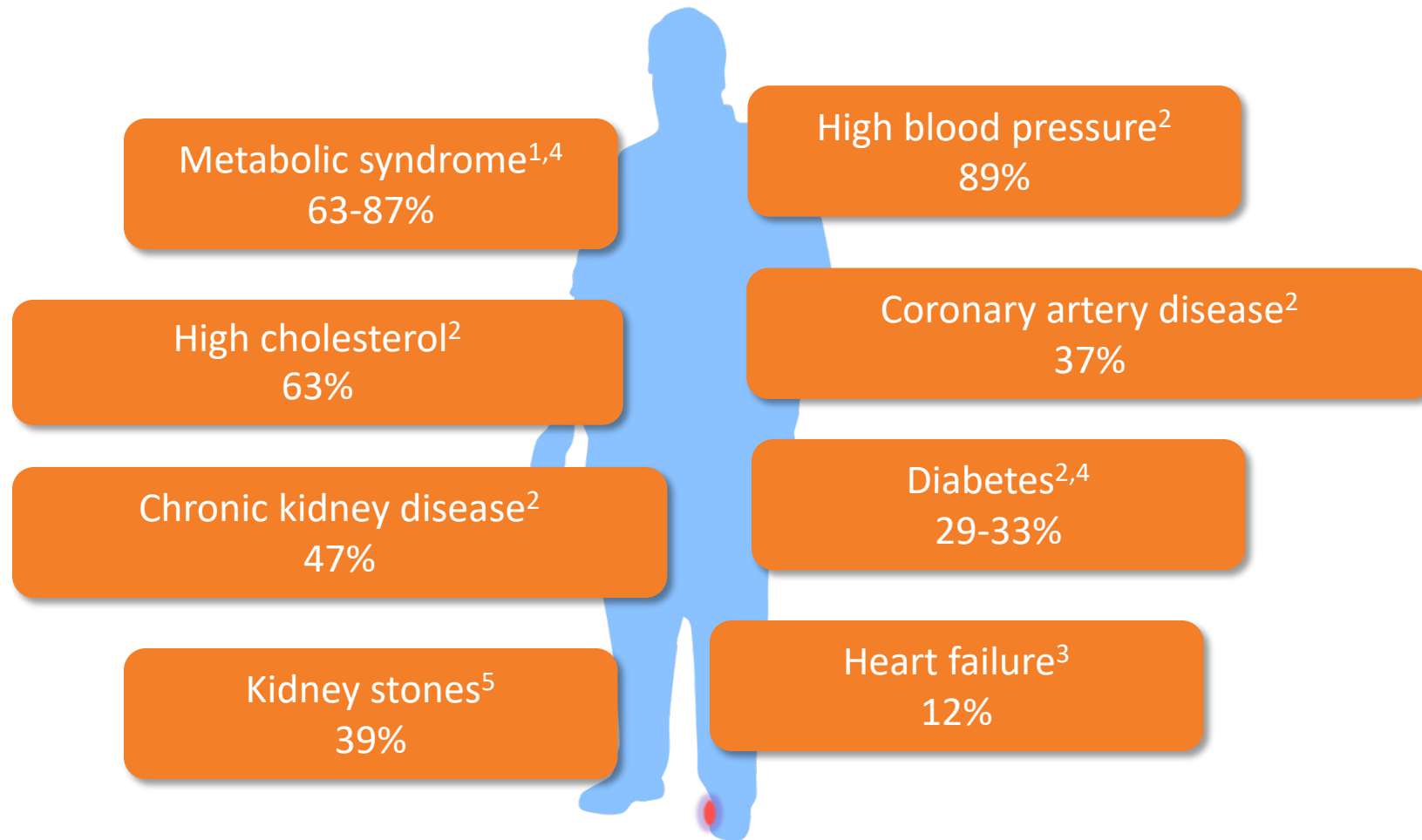




# Gout is more than a pain in the big toe



# Gout is more than a pain in the big toe



1. Choi HK, et al. *Arthritis Rheum.* 2007;57:109-15. 2. Keenan RT, et al. *Am J Med.* 2011;124:155-63. 3. Pandya B, et al. *Arthritis Rheum.* 2010;62(suppl 10):879. 4. Colvine K, et al. *N Z Med J.* 2008;121:73-81. 5. Alvarez-Nemegyei J, et al. *J Rheumatol* 2005;32:2189-91.

# Medical treatment of gout

Treating the gout attack	Preventing the gout attack	Dissolving the uric acid crystals
NSAIDs (e.g. Voltaren)	NSAIDs low dose	<b>Allopurinol</b>
Colchicine	Colchicine low dose	Febuxostat
Prednisone	Prednisone low dose	Probenecid
Joint injection of steroids		

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# Allopurinol

- Most widely used medicine to lower uric acid levels
- Need to take every day
- Recommended for all people with
  - Frequent gout attacks (2 or more in a year)
  - Tophi
  - Joint damage
- Start at a low dose and increase the dose based on blood uric acid levels





Treating gout: uric acid target

A large, orange, multi-pointed starburst shape with a black outline, centered on the slide. It has approximately 12 points of varying lengths, creating a jagged, star-like appearance.

**<0.36 mmol/L**

# Effects of long-term uric acid lowering: crystals

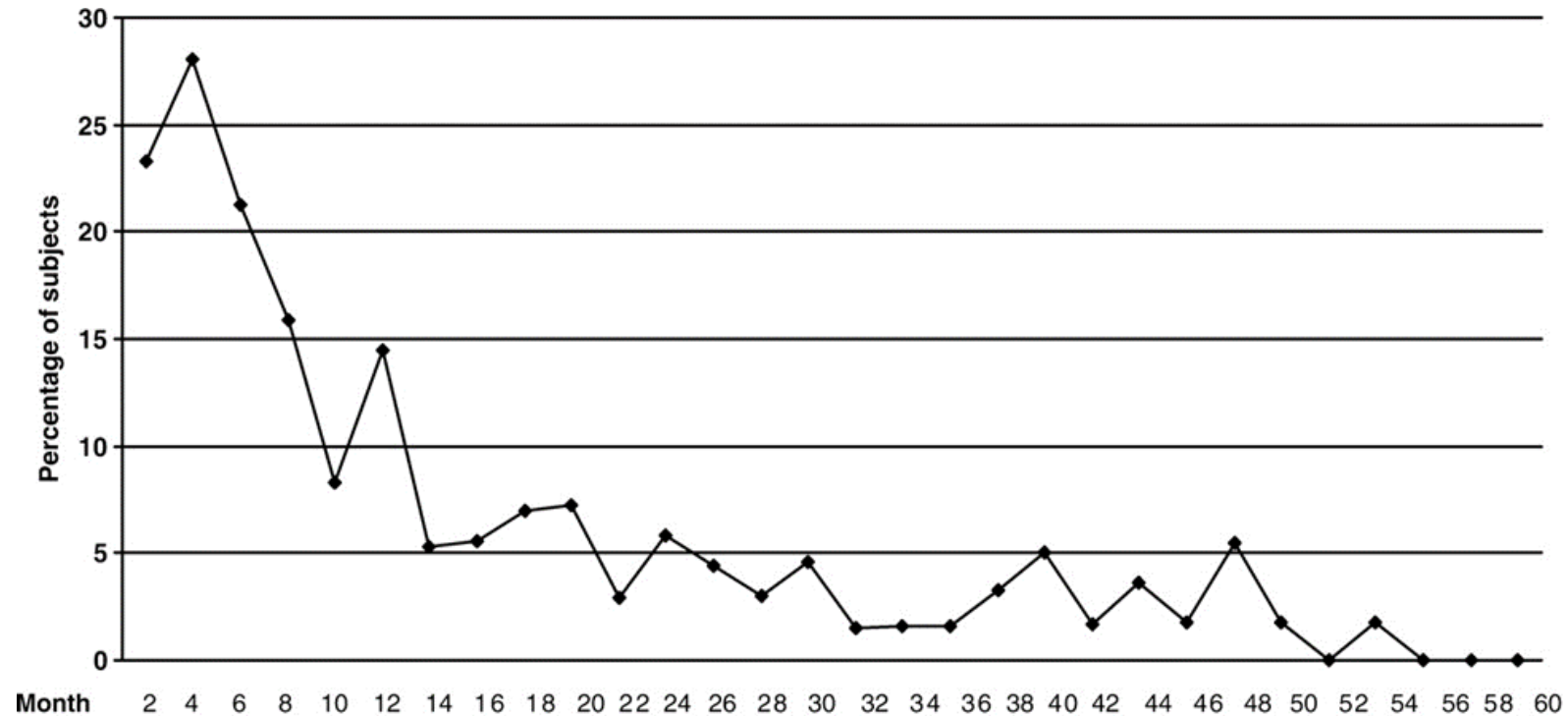
**Baseline**



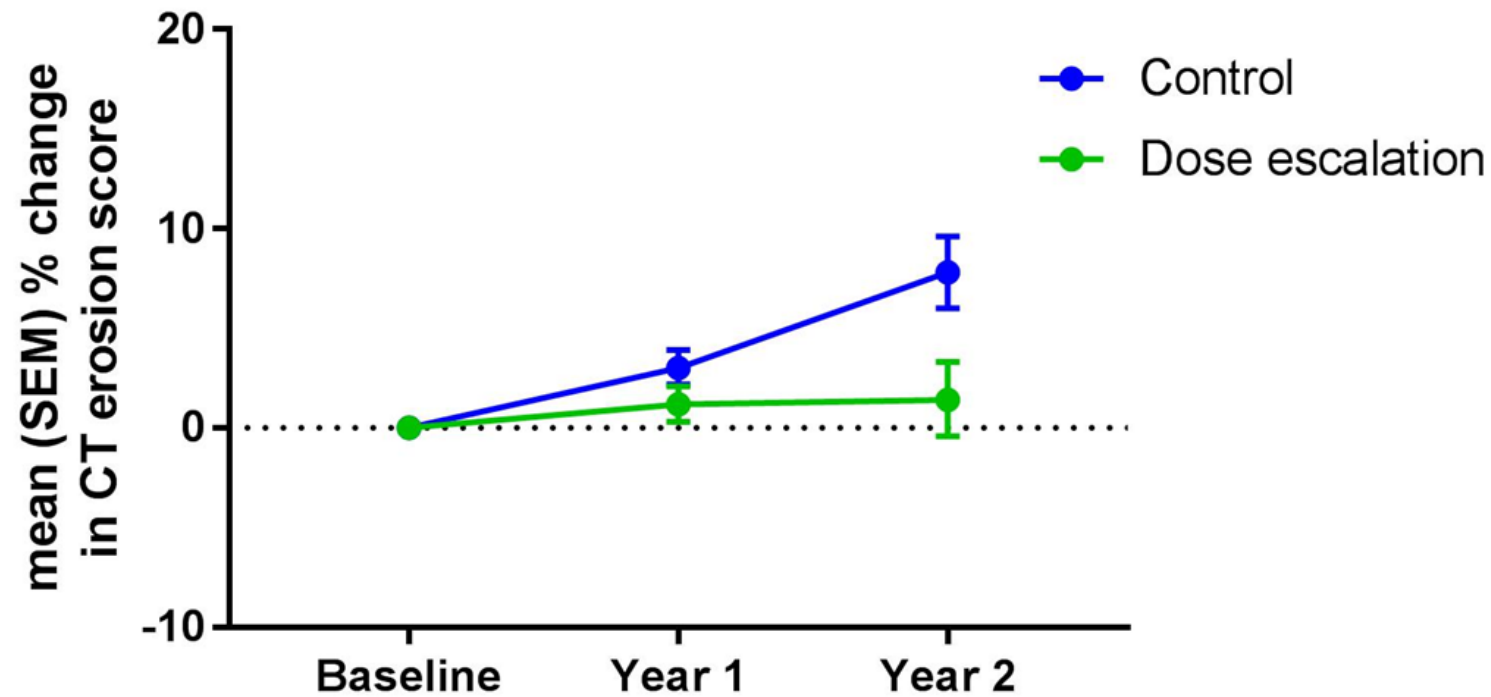
**Year 2**



# Effects of long-term uric acid lowering: gout attacks



# Effects of long-term uric acid lowering : joint damage



# Narratives around diet and excess as the cause and solution

## I got gout in my 30s, so I put myself — and my restaurant — on a diet

By Hailey Eber

January 20, 2016 | 5:30am



Everybody Hates Chris - The Gout - YouTube  
youtube.com

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STYLE | S

WELLNESS | JAN. 2, 2019

## Why Gout Is Making a Comeback

By Katy Schneider



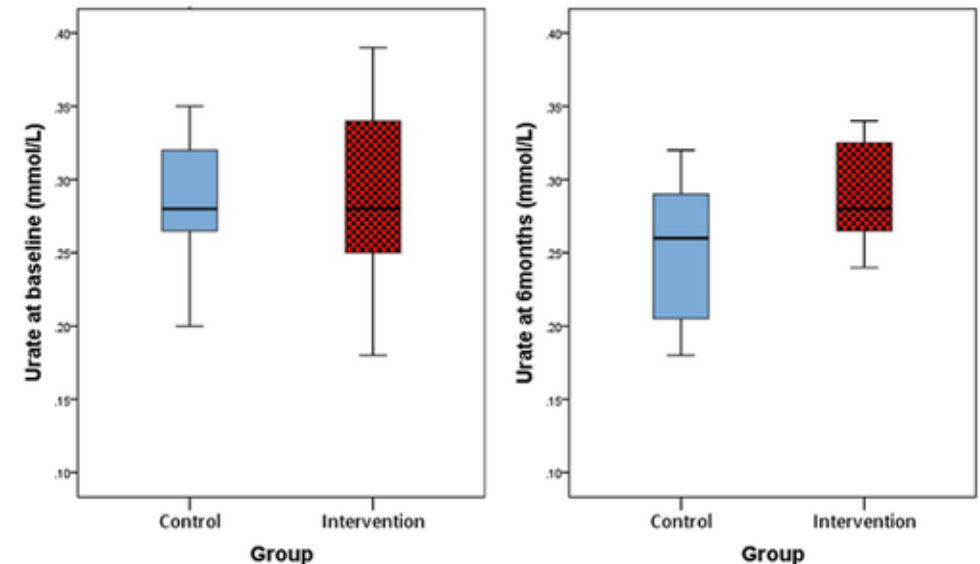
Photo: Fox Searchlight Pictures

Duyk *Arthritis Care Res* 2016  
Murdoch *BMC Rheumatol* 2021



# Comprehensive dietary advice and serum uric acid control in people with treated gout

- Intervention led to significant differences in diet patterns, but
- No difference between groups in
  - Serum uric acid control
  - Gout attacks
  - Weight loss
- Role of diet in gout management



# Efficacy and cost-effectiveness of nurse-led care involving education and engagement of patients and a treat-to-target urate-lowering strategy versus usual care for gout: a randomised controlled trial

*Michael Doherty, Wendy Jenkins, Helen Richardson, Aliya Sarmanova, Abhishek Abhishek, Deborah Ashton, Christine Barclay, Sally Doherty, Lelia Duley, Rachael Hatton, Frances Rees, Matthew Stevenson, Weiya Zhang*

# Nurse-led care

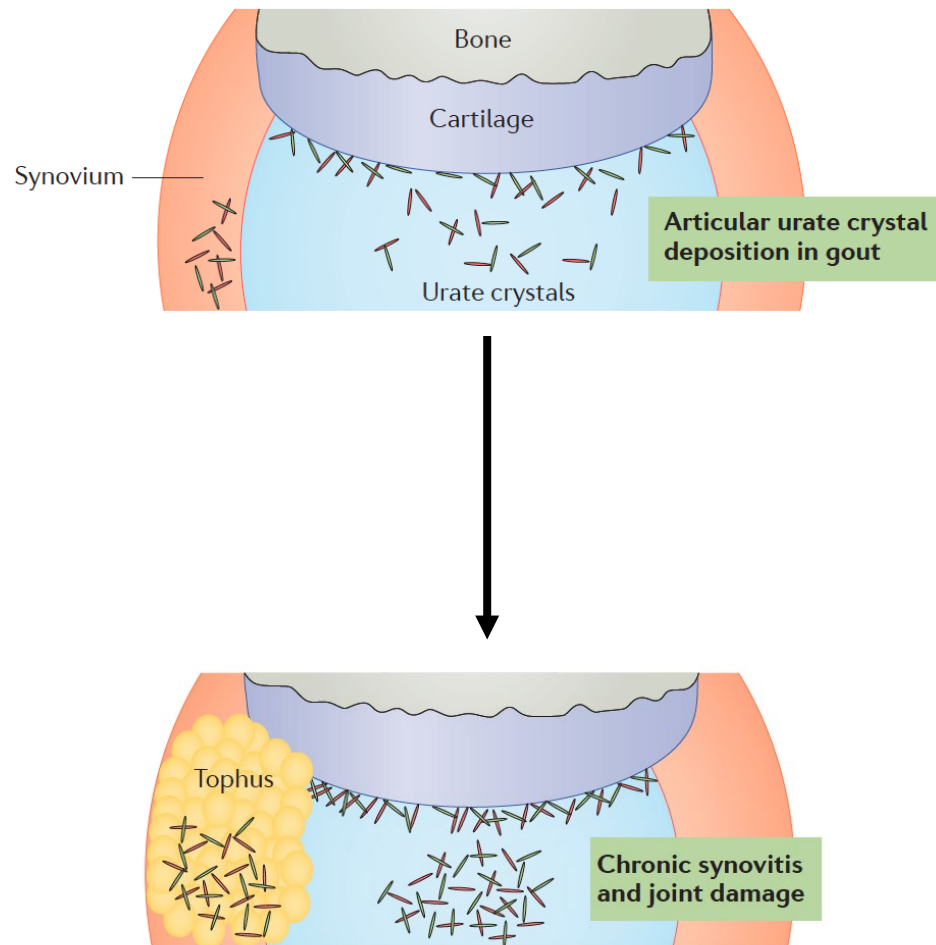
- Nurses discussed the patient's beliefs about gout, gave full information on gout (nature, causes, associations, consequences, and treatment options), and encouraged them to share in decision making.
- Follow-up assessments and uric acid testing were done as often as required by the nurse, allopurinol increased until uric acid was at target
- Telephone contact, face-to-face visits, home visits
- If the nurses had questions about gout management, they could seek advice from a study doctor

# Outcomes of nurse-led care

At Year 2	Nurse led care according to BSR guidelines, n=255	Usual GP care, n=262	P
Uric acid at target level	95%	30%	<0.001
On allopurinol	96%	56%	<0.001
Mean allopurinol dose	460 mg/day	230 mg/day	<0.001
Two or more attacks	8%	24%	<0.001
Tophi present	2.6%	9.6%	<0.002
Health related quality of life	41.31	37.87	<0.05
Patient concern	37	54	<0.001
Patient unmet need	21	34	<0.001

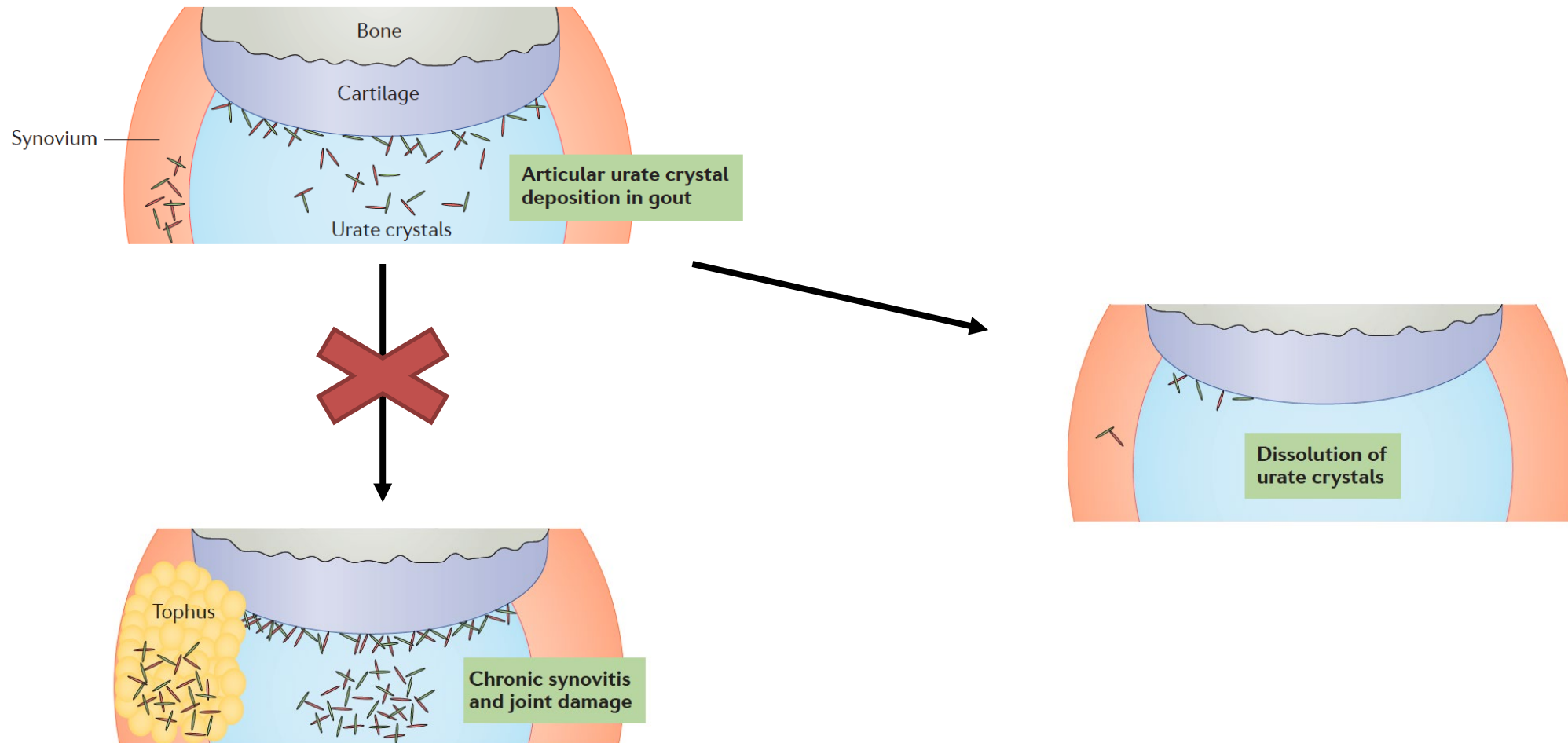
The nurse-led intervention was cost-effective in the short-term and potentially cost-saving in the long-term.

# Under-treated gout





# Treated gout with long-term allopurinol



# Agreed management plan: key points

- Understanding: agree on serum uric acid target
- Start allopurinol slowly, increase until uric acid target achieved
- Ensure consistent supply of allopurinol
- Monitor uric acid
- Action plan for gout attacks
- CVD risk assessment and management
- All of the health care team should play a role!

