

Institution: Keele University		
Unit of Assessment: UoA3 Allied Health Professions, Dentistry, Nursing and Pharmacy		
Title of case study: The Care and Management of Gout in Primary Care		
Period when the underpinning research was undertaken: 2000 - 2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Professor Christian Mallen	Head, Keele School of Medicine NIHR Research Professor in General Practice	2003 - present
Dr Edward Roddy	Clinical Senior Lecturer and Honorary Consultant in Rheumatology	2007 - present
Dr Jennifer Liddle Dr Samantha Hider	Research Associate Reader in Clinical Rheumatology and Honorary Consultant Rheumatologist/PGR Director	2013 - 2017 2007 - present
Dr Jane Richardson	Senior Lecturer in Health Services Research	2002 - 2017
Dr Lorna Clarson	Senior Lecturer in General Practice	2011 - present
Dr John Belcher	Senior Lecturer/Research Associate	January 2012 – December
Matthew Roughley	MPhil student, supervised by Dr Ed Roddy	Academic year 2011-2012
Prof Kelvin P Jordan Priyanaka Chandratre	Professor of Biostatistics Clinical Research Training Fellow	1993 - present 2011 - 2015
Jane Hall	Research User Group	n/a
Period when the claimed impact occurred: 2014 - 2020		
Is this case study continued from a case study submitted in 2014? N		
1. Summary of the impact (indicative maximum 100 words)		
<p>Our world-leading multidisciplinary research has raised the profile of the impact of gout on patients and the public, influenced national and international clinical guidelines and resources to allow practitioners to improve clinical management. It has increased understanding of people's experiences of living with gout, shaped policy and practice, nationally and internationally, and influenced training in primary care and rheumatology. Our research has transformed clinical care through the creation of public-facing resources, such as our module for healthtalk.org, which provides patients with online information about gout and how it affects people's lives.</p>		
2. Underpinning research (indicative maximum 500 words)		
<p>Gout is the most common inflammatory arthritis. Its prevalence and incidence are increasing, owing to population ageing and rising rates of comorbidity and obesity. Gout causes excruciating</p>		

flares of joint pain and swelling, long-term joint damage and impaired health-related quality of life (HRQOL). It is well-understood, yet management is frequently suboptimal.

Based in Keele's Primary Care Centre Versus Arthritis, our gout research group was established in 2008 and published its first research paper in 2010. Led by Roddy (rheumatologist) our multidisciplinary team combines expertise in general practice (Mallen, Clarson), nursing (Finney), dietetics (Watson), quantitative (Muller, Bucknall, Bajpai, Whittle) and qualitative (Richardson, Liddle) methods, and the patient and public's perspective, to undertake high-quality randomised trials, epidemiological and qualitative studies with the aim of improving the management of gout in primary care. Patients and members of the public have helped us to prioritise research questions, design studies (informing, for example, recruitment methods, eligibility criteria, choice of outcomes), and oversee research through Trial Steering Committee membership.

We described rising prevalence and incidence of gout in the UK between 1997 and 2012 (**3.1**). Prevalence peaked at 2.5% in 2012 but suboptimal management persisted, with only 40% of patients receiving definitive treatment with allopurinol throughout this period.

We undertook a qualitative interview study to explore people's experience of having gout and identify the issues relating to the causes, diagnosis, and treatment that are important to them. We found that patients' lack of confidence in and resistance to the diagnosis of gout occurred in response to their misconceptions about its causes and perceived characteristics of gout sufferers (**3.2**). Patients and the public may be unaware that gout is a chronic condition requiring long-term treatment, perpetuating suboptimal management.

Using data from the Clinical Practice Research Datalink (CPRD), we have identified novel, important associations between gout and comorbidities such as vascular disease, sleep disorders, venous thromboembolism and sexual dysfunction. We undertook a large cohort study in CPRD, finding that both men and women with gout are at increased risk of vascular events but risk is greater in women than men (**3.3**). We have shown the burden of chronic kidney disease (CKD) in patients with gout, 24% of people with gout have CKD and the risk of CKD in people with gout is over twice that of the general population (**3.4**). This has led to work demonstrating distinct comorbidity clusters in people with gout.

We performed a systematic review to describe the impact of gout on HRQOL (**3.5**). We found that although both gout and coexisting health conditions contribute to poor HRQOL; gout is associated with impaired HRQOL even after adjusting for these other conditions.

We led the CONTACT trial which is the largest-ever gout flare trial undertaken in primary care (399 participants from 100 general practices) and the first direct head-to-head comparison of a non-steroidal anti-inflammatory drug (naproxen) and colchicine, the most common drug treatments for gout flares (**3.6**). We showed no difference between naproxen and colchicine for pain, but found naproxen was associated with less use of analgesics, fewer side-effects and was more cost-effective.

3. References to the research (indicative maximum of six references)

3.1 Kuo CF, Grainge MJ, Mallen C, Zhang W, Doherty M. Rising burden of gout in the UK but continuing suboptimal management: a nationwide population study. *Ann Rheum Dis* 2015;74 (4): 661-7. doi: [10.1136/annrheumdis-2013-204463](https://doi.org/10.1136/annrheumdis-2013-204463). Epub 2014 Nov 14.

3.2 Liddle J, Roddy E, Mallen CD, Hider SL, Prinjha S, Ziebland S, Richardson J. Mapping patients' experiences from initial symptoms to gout diagnosis: a qualitative exploration. *BMJ Open* 2015;5 (9): e008323. doi: [10.1136/bmjopen-2015-008323](https://doi.org/10.1136/bmjopen-2015-008323).

3.3 Clarson LE, Hider SL, Belcher J, Heneghan C, Roddy E, Mallen CD. Increased risk of vascular disease associated with gout: a retrospective, matched cohort study in the UK clinical practice

research datalink. *Ann Rheum Dis* 2015;74 (4):642–7. doi: 10.1136/annrheumdis-2014-205252. Epub 2014 Aug 27.

3.4 Roughley MJ, Belcher J, Mallen CD, Roddy E. Gout and risk of chronic kidney disease and nephrolithiasis: meta-analysis of observational studies. *Arthritis Res Ther* 2015;17(1):90. doi: 10.1186/s13075-015-0610-9.

3.5 Chandratre P, Roddy E, Clarson L, Richardson J, Hider S, Mallen C. Health-related quality of life in gout: a systematic review. *Rheumatology* 2013;52 (11):2031-40. doi: 10.1093/rheumatology/ket265. Epub 2013 Aug 11.

3.6 Roddy E, Clarkson K, Blagojevic-Bucknall M, Mehta R, Opong, Avery A, Hay E, Heneghan C, Hartshorne L, Hooper J, Hughes G, Jowett S, Lewis M, Little P, McCartney K, Mahtani K, Nunan D, Santer M, Williams S, Mallen C. Open-label randomised pragmatic trial (CONTACT) comparing naproxen and low-dose colchicine for the treatment of gout flares in primary care. *Ann Rheum Dis* 2020;79(2):276-284. doi: 10.1136/annrheumdis-2019-216154. Epub 2019 Oct 30

4. Details of the impact (indicative maximum 750 words)

Impact on updated national and international gout management guidelines

Our research features in national and international guidelines (**5.1, 5.2, 5.3**). The rising prevalence and incidence of gout (**3.1**) was cited as key justification for the updated 2016 European League Against Rheumatism (EULAR) recommendations (co-author Mallen) and 2017 British Society for Rheumatology (BSR) guidelines (lead Roddy, co-author Mallen) (**5.1, 5.2**). Our work demonstrating increased cardiovascular risk in people with gout (**3.3**) underpinned the EULAR recommendations' overarching principle that every person with gout should be screened for associated comorbidities and cardiovascular risk (**5.1**). Our systematic review highlighting the prevalence of chronic kidney disease (CKD) in people with gout (**3.4**) was cited in the BSR guideline to support including a specific section dedicated to treating gout in patients with CKD, given the challenges of managing these patients (**5.2**). A key change in these guidelines from earlier versions was a shift to recommend earlier commencement of definitive pharmacological urate-lowering therapy (**5.1, 5.2**). Both guidelines cited our systematic review of the impact of gout on quality of life (**3.5**) as key evidence underpinning this shift. The CONTACT trial (**3.6**) was included in the systematic review and network meta-analysis which informed the recommendation in the American College of Rheumatology 2020 guideline that NSAIDs and colchicine are appropriate first-line therapy for gout flares (**5.3**).

The updated EULAR recommendations and BSR guidelines were both cited in the National Institute for Health and Care Excellence (NICE) Gout Clinical Knowledge Summary 2018 (**5.4**). The BSR guideline was accredited by NICE and endorsed by the Royal College of General Practitioners (**5.2**). It was included in the journal *Rheumatology's* "Best of 2017" as one its five most downloaded papers in 2017 (viewed online >5200 times in the first 12 months following publication) (**5.5**) and voted the 4th most useful, interesting, or practice-changing paper from 2017 by Red Whale, a leading provider of UK primary care medical education (**5.6**).

Impact on international expert consensus on gout terminology and disease labels

Lack of clarity regarding the communication of disease-related concepts in clinical settings identified by our qualitative study (**3.2**) was cited as key justification for a recent international consensus exercise involving 79 experts in gout from 22 countries, led by the international, multidisciplinary, collaborative Gout, Hyperuricemia and Crystal-Associated Disease Network (G-CAN) network to agree terminology for gout disease states, published in 2019 (**5.7**).

Understanding patients' experiences of gout

Prior to merging with Arthritis Research UK to form Versus Arthritis, Arthritis Care was the UK's largest organisation working with and for people with arthritis. In 2014, it undertook a large survey of people's experiences of having gout (co-authors Roddy, Mallen). Our research (**3.1**) was cited

prominently in the resulting Gout Nation report (5.8), inspiring Arthritis Care's Gout Awareness month in 2015.

Developing freely accessible patient-facing material

We worked with patients and members of the public to develop patient-facing educational materials about gout to support patients, carers and healthcare professionals. Healthtalk.org is managed by Oxford-based Dipex Charity, whose mission is to help and inform patients, carers and healthcare professionals by sharing freely accessible, personal, real-life health experiences. Published in 2014, the content of our online healthtalk gout resource arose directly from our qualitative research (3.2) and has been viewed 428,016 times since going live in 2014 with positive public comments and feedback through the webpages (personal correspondence from Dipex, June 2020). The gout videos are viewed around 4,000 times per month (5.9).

Developing the Multidisciplinary Workforce Internationally

As lead author of the Crystal Arthropathy module of the EULAR on-line course, Roddy has implemented our research describing gout's rising prevalence and incidence: its impact on quality of life was cited to emphasise the burden posed by gout (3.1, 3.5). The module targets knowledge and skills to suit the final years of rheumatology training (5.10) and has been accessed by 1540 students since 2016.

Inspired by our paper describing suboptimal management of gout (3.1), our local Clinical Commissioning Group's Practice Nurse evidence-based practice group investigated the benefits of nurse-led gout consultations as a Critically Appraised Topic and audited management of gout across six local practices. After identifying sub-optimal practice, current guidelines were circulated to over 200 practice nurses at 134 practices across North Staffordshire and South Cheshire. The BSR guidelines were also shared on a dedicated website for the group. Subsequently, 30 primary care nurses have opted for additional gout training to improve their practice and expressed interest in participating in a randomised trial of nurse-led gout care.

5. Sources to corroborate the impact (indicative maximum of 10 references)

5.1 Richette P, Doherty M, Pascual E, Barskova V, Becce F, Castaneda-Sanabria J, et al. 2016 updated EULAR evidence-based recommendations for the management of gout. *Ann Rheum Dis* 2016;76(1):29-42. doi: [10.1136/annrheumdis-2016-209707](https://doi.org/10.1136/annrheumdis-2016-209707). Epub 2016 Jul 25. **[International Guideline]**

5.2 Hui M, Carr A, Cameron S, Davenport G, Doherty M, Forrester H, et al (2017). The British Society for Rheumatology Guideline for the Management of Gout. *Rheumatology* 2017;56(7):1246. doi: [10.1093/rheumatology/kex250](https://doi.org/10.1093/rheumatology/kex250). **[National Guideline]**

5.3 FitzGerald JD, Dalbeth N, Mikuls T, Brignardello-Petersen R, Guyatt G, Abeles AM, Gelber AC, Harrold LR, Khanna D, King C, Levy G, Libbey C, Mount D, Pillinger MH, Rosenthal A, Singh JA, Sims JE, Smith BJ, Wenger NS, Bae SS, Danve A, Khanna PP, Kim SC, Lenert A, Poon S, Qasim A, Sehra ST, Sharma TSK, Toprover M, Turgunbaev M, Zeng L, Zhang MA, Turner AS, Neogi T. [2020 American College of Rheumatology Guideline for the Management of Gout](https://doi.org/10.1002/acr.24180). *Arthritis Care Res (Hoboken)* 2020;72(6):744-760. doi: 10.1002/acr.24180. Epub 2020 May 11. **[International Guideline]** Appendix 7, Roddy (CONTACT) listed pg 1 and 43.

5.4 National Institute for Health and Care Excellence (NICE) Clinical Knowledge Summaries. Gout. <https://cks.nice.org.uk/gout>

5.5 *Rheumatology* journal, Oxford University Press. Best of 2017: https://academic.oup.com/rheumatology/pages/best_of_2017 (Weblink no longer available but screen shot provided through Keele repository)

5.6 Red Whale. Red Whale's Top 10 from 2017. <https://www.gp-update.co.uk/enewsletter/2018/February/WLOGPs%20Top%20Ten%20from%202017?platform>

[m=hootsuite](#) [national education. Red Whale is a leading primary care medical education provider (conferences attended by 15,000 primary care practitioners per year)]

5.7 Bursill D, Taylor WJ, Terkeltaub R, Abhishek A, So AK, Vargas-Santos AB, Gaffo A, Rosenthal A, Tausche AK, Reginato AM, Manger B, Scirè CA, Pineda C, van Durme C, Lin CT, Yin C, Albert DA, Biernat-Kaluza E, Roddy E, Pascual E, Becce F, Perez-Ruiz F, Sivera F, Lioté F, Schett G, Nuki G, Filippou G, McCarthy GM, Da Rocha Castelar-Pinheiro G, Ea HK, De Almeida Tupinambá H, Yamanaka H, Choi HK, Mackay JM, O'Dell JR, Vázquez-Mellado J, Singh JA, Fitzgerald JD, Jacobsson LTH, Joosten LAB, Harrold LR, Stamp LK, Andrés M, Gutierrez M, Kuwabara M, Dehlin M, Janssen M, Doherty M, Hershfield MS, Pillinger MH, Edwards NL, Schlesinger N, Kumar N, Slot O, Ottaviani S, Richette P, MacMullan P, Chapman P, Lipsky PE, Robinson PC, Khanna PP, Gancheva RN, Grainger R, Johnson RJ, Te Kampe R, Keenan RT, Tedeschi SK, Kim SC, Choi S, Fields TR, Bardin T, Uhlig T, Jansen TL, Merriman TR, Pascart T, Neogi T, Klück V, Louthrenoo W, Dalbeth N. Gout, Hyperuricemia and Crystal-Associated Disease Network (G-CAN) consensus statement regarding labels and definitions of disease states of gout. *Ann Rheum Dis* 2019 Nov;78(11):1592-1600. doi: [10.1136/annrheumdis-2019-215933](https://doi.org/10.1136/annrheumdis-2019-215933). Epub 2019 Sep 9.

5.8 Arthritis Care. **Gout Nation Report. 2014.** <https://www.prnewswire.co.uk/news-releases/suffering-in-silence-new-statistics-prove-that-gout-is-no-laughing-matter-278341521.html>. (Report no longer publicly available download held within Keele's repository).

5.9 Healthtalk.org Gout is a **National Online Patient Resource**. Available at: <http://healthtalk.org/peoples-experiences/bones-joints/gout/topics>. Advisory Panel led by Liddle J, Richardson J.

5.10 European League Against Rheumatism (EULAR) **Online Course on Rheumatic Diseases** (2 year course, current course 16th) and Faculty list. <https://esor.eular.org/enrol/index.php?id=224>