Medical practice, too, has changed in 40 years with far greater specialisation and a decline in the number of health professionals going into the general specialties. This trend seems set to continue: in the USA between 2001 and 2010, there was a 6·3% decrease in the number of graduate residents entering primary care, but a 45% increase in the medical and surgical subsubspecialties.[13] In Egypt, India, Jordan, Tunisia, and Turkey, less than 10% of physicians choose family medicine.[14]

Taken together these developments suggest a model of primary health care with nurses at its centre, able to call on other medical and specialist support where necessary and refer on to more specialised facilities. In this model, nurses and midwives will provide much of the hands-on care, including the management of non-communicable diseases. They will coordinate, supervise, and support the work of community health workers. Finally, nurses will work with local people and local community groups, such as health coaches and knowledge suppliers, and support self-care, promote health, and prevent diseases.

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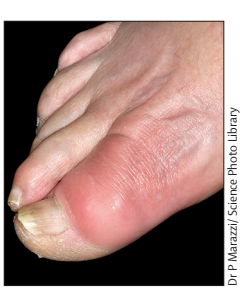
1 WHO. Declaration of Alma-Ata International Conference on Primary Health Care, Alma-Ata, USSR, 6-12 September 1978. http://www.who.int/publications/almaata_declaration_en.pdf?ua=1&ua=1 (accessed Sept 25, 2018).
2 WHO. Global strategy on human resources for health: workforce 2030. Geneva: World Health Organization, 2016. http://www.who.int/hrh/resources/pub_globstrathrh-2030/en/ (accessed Sept 25, 2018).
3 WHO. "Working for health": a five-year action plan for health employment and inclusive economic growth (2017–21). Geneva: World Health Organization, 2017. http://www.who.int/hrh/com-heeg/action-plan-annexes/en/ (accessed Sept 25, 2018).
4 Crisp N, Iro E. Nursing Now campaign: raising the status of nurses. *Lancet* 2018; **391:** 920–21.
5 Vinayak S, Brownie S. Collaborative task-sharing to enhance the Point-Of-Care Ultrasound (POCUS) access among expectant women in Kenya: the role of midwife sonographers. *J Interprof Care* 2018; published online May 10. DOI:10.1080/13561820.2018.1470499.
6 Commission on Social Determinants of Health. Closing the gap in a generation: health equity through action on the social determinants of health: Commission on Social Determinants of Health final report. Geneva: World Health Organization, 2008. http://www.who.int/social_determinants/thecommission/finalreport/en/ (accessed Sept 25, 2018).
7 WHO. Health in all policies: framework for country action. 2014. http://www.who.int/healthpromotion/frameworkforcountryaction/en/ (accessed Sept 25, 2018).
8 Rippon S, Hopkins T. Head, hands and heart: asset-based approaches in health care. A review of the conceptual evidence and case studies of asset-based approaches in health, care and wellbeing. London: Health Foundation, 2015. https://www.health.org.uk/publication/head-hands-and-heart-asset-based-approaches-health-care (accessed Sept 25, 2018).
9 Were M: Community health, community workers and community governance. In: Omaswa F, Crisp N. African health leaders: making change and claiming the future. Oxford: Oxford University Press, 2015: 109–24.
10 All-Party Parliamentary Group on Global Health. Triple impact of nursing. London: All-Party Parliamentary Group on Global Health, 2016.
11 Laurant M, van der Biezen M, Wijers N, Watananirun K, Kontopantelis E, van Vught AJAH. Nurses as substitutes for doctors in primary care. *Cochrane Database Syst Rev* 2018; **7:** CD001271.
12 WHO. Time to deliver: report of the WHO Independent High-Level Commission on Noncommunicable Diseases. Geneva: World Health Organization, 2018. http://www.who.int/ncds/management/time-to-deliver/en/ (accessed Sept 25, 2018).
13 Jolly P, Erikson C, Garrison G. US graduate medical education and physician specialty choice. *Acad Med* 2013; **88:** 468–74.
14 Nair M, Webster P. Education for health professionals in the emerging market economies: a literature review. *Med Educ* 2010; **44:** 856–63.

Patient education and engagement in treat-to-target gout care

Gout is the most common inflammatory arthritis worldwide, affecting 4·0% of adults in the USA and 2·5% of adults in the UK.[1] The pathophysiology of this crystal arthritis is well understood, and inexpensive urate-lowering drugs that address the underlying cause of the disease are widely available. Yet gout remains poorly managed, with 70% of patients experiencing recurrent gout flares[2] and substantial burden from tophi and joint damage, which lead to functional limitations and diminished quality of life.

Patients with gout often have concomitant cardiovascular disease, renal insufficiency, and diabetes, making treatment of gout challenging. Compounding this complexity is the time-limited nature of visits with general practitioners (GPs) who provide most gout care in many countries. Moreover, management controversies have arisen due to discordance between recommendations for the management of gout.[3,4] Guidelines from rheumatology organisations universally support a treat-to-target strategy that aims to lower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urate concentrations to prevent crystallisation and the associated clinical manifestations.[5,6] By contrast, the American College of Physicians' guidelines state that there are insufficient data to support such a strategy, and suggest that a strategy of treating to avoid symptoms may be reasonable.[7] Furthermore, questions have been raised about the cardiovascular safety of the urate-lowering drug febuxostat[8] and, therefore, optimising the use of allopurinol is gaining attention.[9]

In *The Lancet*, Michael Doherty and colleagues[10] report the findings of a UK community-based randomised controlled trial of nurse-led care that involved education and engagement of patients and use of a treat-to-target urate-lowering strategy in 255 patients compared with usual care, led by GPs, in 262 patients. The primary outcome was achievement of serum urate concentrations of less than 360 μmol/L at 2 years, the accepted outcome for gout trials by regulatory agencies, reflecting the level below which serum urate should not crystallise under physiological conditions. In the nurse-led group, 95% of patients compared with 30% in the usual-care group achieved the primary endpoint after 2 years (risk ratio [RR] 3·18, 95% CI 2·42–4·18; p<0·0001). A similar effect was noted in the 1-year assessment (95% *vs* 26%, RR 3·59, 95% CI 2·72–4·75). The clinically relevant patient-centred endpoints of gout flares and tophi were also significantly lower among patients in the nurse-led group than those in the usual-care group. The risk of having two or more flares per year in year 2 was 67% lower in the nurse-led group than in the usual-care group (RR 0·33, 95% CI 0·19–0·57). Resolution of tophi occurred only in the nurse-led group, and the risk of having any tophi at the end of follow-up was 79% lower than in the usual-care group (RR 0·21, 95% CI 0·08–0·52). The cost per quality-adjusted life-year gained for nurse-led care at 2 years was £5066 and was projected to be cost saving by 5 years.

A limitation of this study was the lack of blinding, which potentially led to improvements in usual care by GPs. The true effects, therefore, might be even more pronounced than reported. Adverse effects were not uniformly assessed in the usual-care group, which makes comparison of this aspect of care not possible. Nonetheless, among 24 (9·6%) participants in the nurse-led group who discontinued first-line treatment, all were successfully taking another urate-lowering therapy by the end of year 1.

Doherty and colleagues' findings add to the evidence of the efficacy of urate-lowering therapy on clinical endpoints in gout. Two randomised trials, one with febuxostat[11] and the other with pegloticase,[12] showed improvements in gout flares, and in the pegloticase trial tophi resolution was greater than with placebo. Taken together, there are now ample data from randomised trials supporting a treat-to-target approach for urate-lowering therapy to improve patient-centred outcomes.

In contrast to previous studies that have reported low adherence to gout management strategies, adherence to urate-lowering therapy in the nurse-led programme in the study by Doherty and colleagues[10] was high at 2 years (96%) compared with 56% adherence in the usual-care group. Doses of allopurinol were higher in the nurse-led than in the usual-care group, with 79% and 10% of patients, respectively, taking doses greater than 300 mg/day at 2 years (mean dose 430 mg/day in the nurse-led group *vs* 230 mg/day in the usual-care group). Both these factors contributed to the marked beneficial effects in the nurse-led group.

The findings suggest that patients adhere to treatment when they receive information about the pathophysiological causes of gout, have regular follow-up and feedback, and a treat-to-target approach is used. GPs might not have the time for provision of gout care in this manner, but models of care involving non-physician health-care professionals in other settings, such as anticoagulation clinics and direct observation therapy for tuberculosis, have been successful. Development and training of the health-care workforce to implement this approach in gout care is now a priority.

Doherty and colleagues[10] show a path forward for improved gout outcomes, demonstrating a package of care that leads to sustained adherence and clinical benefits through individualised education focusing on the central concept of gout as a chronic disease of urate crystal deposition and through using a well tolerated proactive treat-to-target approach. Highly efficacious and cost-effective gout management can be readily achieved by educating and spending time with patients.

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1 Kuo CF, Grainge MJ, Zhang W, Doherty M. Global epidemiology of gout: prevalence, incidence and risk factors. *Nat Rev Rheumatol* 2015; **11:** 649–62.
2 Neogi T, Hunter DJ, Chaisson CE, Allensworth-Davies D, Zhang Y. Frequency and predictors of inappropriate management of recurrent gout attacks in a longitudinal study. *J Rheumatol* 2006; **33:** 104–09.
3 Dalbeth N, Bardin T, Doherty M, et al. Discordant American College of Physicians and international rheumatology guidelines for gout management: consensus statement of the Gout, Hyperuricemia and Crystal-Associated Disease Network (G-CAN). *Nat Rev Rheumatol* 2017; **13:** 561–68.
4 Neogi T, Mikuls TR. To treat or not to treat (to target) in gout. *Ann Intern Med* 2017; **166:** 71–72.
5 Khanna D, Fitzgerald JD, Khanna PP, et al. 2012 American College of Rheumatology guidelines for management of gout. Part 1: systematic nonpharmacologic and pharmacologic therapeutic approaches to hyperuricemia. *Arthritis Care Res (Hoboken)* 2012; **64:** 1431–46.
6 Richette P, Doherty M, Pascual E, et al. 2016 updated EULAR evidence-based recommendations for the management of gout. *Ann Rheum Dis* 2017; **76:** 29–42.
7 Qaseem A, Harris RP, Forciea MA, Clinical Guidelines Committee of the American College of Physicians. Management of acute and recurrent gout: a clinical practice guideline from the American College of Physicians. *Ann Intern Med* 2017; **166:** 58–68.
8 White WB, Saag KG, Becker MA, et al. Cardiovascular safety of febuxostat or allopurinol in patients with gout. *N Engl J Med* 2018; **378:** 1200–10.
9 Choi H, Neogi T, Stamp L, Dalbeth N, Terkeltaub R. Implications of the cardiovascular safety of febuxostat and allopurinol in patients with gout and cardiovascular morbidities (CARES) trial and associated FDA public safety alert. *Arthritis Rheumatol* 2018; published online June 5. DOI:10.1002/art.40583.
10 Doherty M, Jenkins W, Richardson H, et al. 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. *Lancet* 2018; **392:** 1403–12.
11 Dalbeth N, Saag KG, Palmer WE, et al. Effects of febuxostat in early gout: a randomized, double-blind, placebo-controlled study. *Arthritis Rheumatol* 2017; **69:** 2386–95.
12 Sundy JS, Baraf HS, Yood RA, et al. Efficacy and tolerability of pegloticase for the treatment of chronic gout in patients refractory to conventional treatment: two randomized controlled trials. *JAMA* 2011; **306:** 711–20.

No benefit of chlamydia screening in primary care?

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Chlamydia trachomatis is the most common sexually transmitted bacterial infection worldwide. Persistent, untreated infection with *C trachomatis* leads to pelvic inflammatory disease (PID) and other complications, including ectopic pregnancy and tubal factor infertility. Researchers have shown that interventions that shorten the duration of infection through timely detection and treatment decrease PID incidence by 32%.[1] On the basis of that and other evidence, many high-income countries support annual screening and treatment programmes for chlamydia in young women, repeated screening of those who are infected, and expedited partner treatment.[2,3] Given that most *C trachomatis* infections are asymptomatic, diagnosis and treatment relies on effective screening programmes largely delivered in primary care clinics.

In *The Lancet*, Jane S Hocking and colleagues[4] investigate the effect of clinic-based, opportunistic chlamydia screening on *C trachomatis* prevalence and the incidence of both PID and epididymitis at the population level. They report the findings of a large, cluster-randomised controlled trial among patients aged 16–29 years having consultations for any reason at primary care clinics in rural towns in Australia. The clinics in the intervention group received a package of interventions aimed at increasing the proportion of patients screened for chlamydia, including provider education, payments to general practitioners and nurses for any eligible patients tested, quarterly feedback reports, and computerised reminders, whereas the clinics in the control group were instructed to provide usual care.

The primary outcome was chlamydia prevalence, which decreased in both groups: from 5·0% (95% CI 3·8 to 6·2) to 3·4% (2·7 to 4·1) in the intervention group and from 4·6% (3·5 to 5·7) to 3·4% (2·4 to 4·5) in the control group, an absolute difference in prevalence reduction between intervention and control clusters of −0·5% (95% CI −2·6 to 1·5). The incidence of PID diagnosed in hospital was 40% lower in the intervention group than in the control group (unadjusted risk ratio 0·6, 95% CI 0·4 to 1·0; p=0·044), whereas there was no difference between groups in the incidence of PID diagnosed in clinics (1·1, 0·7 to 1·8; p=0·56) or in the incidence of epididymitis (0·9, 0·6 to 1·4; p=0·77). Screening uptake increased moderately in both groups during the study, from 8·2% (95% CI 7·0 to 9·4) to 20·1% (18·4 to 21·8) in the intervention group and from 8·2% (7·2 to 9·2) to 12·9% (11·2 to 14·5) in the control group.