

and all have high house prices and rents, as well as good public transport and accessibility to primary care.

Nonetheless, a relatively large sample was achieved of 860 people aged 65 years or over living alone, and the careful comparisons with those who lived with others (controlling for many sociodemographic attributes) produced many fascinating findings about health status, health behaviour, and healthcare utilisation patterns. The findings have to be interpreted carefully, however, for once important controls were introduced (those living alone had a higher average age and a larger proportion were women), just two chronic conditions had clearly significant positive odds ratios, arthritis/rheumatism and glaucoma, while, for mental health, no difference was found in depression or self-reported memory loss.

Barber<sup>4</sup> and Taylor<sup>6</sup> showed that it is exceedingly difficult to identify patient attributes that are serviceable targeting criteria. Given that social change is now so rapid, a risk factor in one generation can be a sign of advantage in the next (living alone is not yet that in Britain). Over the last decade, researchers have increasingly explored the merits of targeting those with shared event experiences (rather than attributes), as of falls and emergency hospital admissions. If the science of 'case finding' is to progress, event sequences may be the next port of call. It has been shown, for example, that among 'low achiever' older people, combinations

of ceasing work, the bereavement of spouse or last co-resident parent, taking over a house tenancy, the onset of a disabling condition, and living alone, for some signal the person becoming homeless for the first time in their lives.<sup>12</sup> In some parts of the country, primary care and housing-welfare staff have begun to work collaboratively to identify 'hard to reach', vulnerable older people with relatively high unmet needs and inadequate health care.<sup>13,14</sup>

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### REFERENCES

1. Kharicha K, Iliffe S, Harari D, *et al.* Health risk appraisal in older people 1: are older people living alone an at-risk group? *Br J Gen Pract* 2007; **57**: 271–276.
2. Iliffe S, Kharicha K, Harari D, *et al.* Health risk appraisal in older people 2: the implications for clinicians and commissioners of social isolation risk in older people. *Br J Gen Pract* 2007; **57**: 277–282.
3. Fletcher AE, Price GM, Ng ESW, *et al.* Population-based multidimensional assessment of older people in UK general practice: a cluster-randomised factorial trial. *Lancet* 2004; **364**: 1667–1677.
4. Barber JH, Wallis JB. Assessment of the elderly in general practice. *J R Coll Gen. Pract* 1976; **26**: 106–114.
5. Barber JH, Wallis JB, McKecting E. A postal screening questionnaire in preventive geriatric care. *J Coll Gen Pract* 1980; **30**: 49–51.
6. Ford G, Taylor R. Risk groups and selective case finding in an elderly population. *Soc Sci Med* 1983; **17** (10): 647–655.
7. Gravelle H, Dusheiko M, Sheaff R, *et al.* Impact of case management (EverCare) on frail elderly patients: controlled before and after analysis of quantitative outcome data. *BMJ* 2007; **334** (7583): 31.
8. Cattan M, White M, Bond J, Learmouth A.

Preventing social isolation and loneliness among older people: a systematic review of health promotion interventions. *Ageing Soc* 2005; **25**: 41–67.

9. Victor CR, Scambler SJ, Bowling A, Bond A. The prevalence of, and risk factors for, loneliness in later life: a survey of older people in Great Britain. *Ageing Soc* 2005; **25**(3): 357–375.
10. Ministerio de Trabajo y Asuntos Sociales. *Observatorio de Personas Mayores, Las Personas Mayores en España: Informe 2000* [Observatory of older people: elderly people in Spain in 2000]. Madrid: Ministerio de Trabajo y Asuntos Sociales, 2000.
11. Gierveld JJ, Peeters A. The interweaving of repartnered older adults' lives with their children and siblings. *Ageing Soc* 2003; **23**(2): 187–205.
12. Crane M, Byrne K, Fu R, *et al.* The causes of homelessness in later life: findings from a three-nation study. *J Geront Soc Sci* 2005; **60B**(3): S152–S159.
13. Crane M, Fu R, Warnes AM. *Building homelessness prevention practice: combining research evidence and professional knowledge*. Sheffield: Sheffield Institute for Studies on Ageing, University of Sheffield, 2004.
14. Crane M, Warnes AM, Fu R. Developing homelessness prevention practice: combining research evidence and professional knowledge. *Health Soc Care Community* 2006; **14**(2): 156–166.

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## Chronic diseases: what happens when they come in multiples?

Multimorbidity is the coexistence of two or more chronic diseases in an individual.<sup>1</sup> Prevalence studies indicate that it is the normal state of affairs, especially in patients over the age of 65 years.<sup>1</sup> A smaller subgroup of patients are more severely affected by multimorbidity as the combination and severity of their conditions results in significant loss of function, poor quality of life, and frequent hospital

admissions. There is a need to examine the health care of patients with multimorbidity, as they often receive fragmented specialist care which does not meet their needs, or indeed support their professional carers, especially in primary care.

Chronic disease care is now based on protocol driven management for a single disease across primary and secondary care.<sup>2</sup> The commonly used term

'comorbidity' implies that there is an index disease to which coexistent diseases relate and may share an aetiology and perhaps a solution. In clinical practice individual patients often suffer from a collection of chronic illnesses which may or may not have a common aetiology, but which require greatly differing and often incompatible management. This is why we use the term multimorbidity here.

Individuals with multimorbidity are more likely to die prematurely, be admitted to hospital, have longer hospital stays, poorer quality of life, and a loss of physical functioning.<sup>3,4</sup> They are more likely to suffer from depression, to be receiving multiple medications, and to have consequent difficulties with adherence to treatment and polypharmacy.<sup>5,6</sup> Qualitative research indicates that patients with multimorbidity identify loss of function and polypharmacy as key problem areas.<sup>7</sup> There are multiple barriers to self-care including physical limitations and aggravation of one condition by treatment of another.<sup>8</sup> Research also highlights difficulties accessing care<sup>9</sup> and problems with healthcare providers, particularly specialists.<sup>7</sup> Analysis of data from the Quebec Health Survey indicated that patients with more than one chronic condition were significantly more likely to have higher levels of psychological distress and poorer mental health.<sup>9</sup>

The full physical and psychological impact of multimorbidity depends on the disease combinations, severity of coexisting conditions, and the age of the patient. Multimorbidity has knock-on effects for family members who face dependency issues and social isolation. While support may be available from voluntary organisations for single diseases, it is less likely to be available for multimorbidity. The result can be a housebound patient disabled by a number of illnesses receiving low level primary care and some social support in a therapeutically inconclusive manner.

Difficulties in management result in frequent emergency hospital admissions and repeated investigations with costs for both individuals and the healthcare system. A UK report has highlighted the costs associated with this group of patients who are described as 'high-impact users' on the basis of their frequent emergency admissions.<sup>10</sup> The 15% of people with three or more chronic conditions account for almost 30% of inpatient days in the UK.<sup>11</sup>

Disease specific protocols are probably best suited to younger patients with single conditions who have not yet developed other diseases. However, for the majority of patients such guidelines may be

clinically naïve, in that they fail to take account of the reality of multimorbidity in an increasing number of patients. A study of US adults with at least one of five common chronic conditions (diabetes, ischaemic heart disease, hypertension, asthma, and mood disorder) indicated that 60% of patients with ischaemic heart disease and 55% of patients with diabetes had at least one of the other conditions. This may affect how clinical guidelines for each condition can be implemented and has led to<sup>12</sup> more generic approaches to chronic disease management, such as the Chronic Care Model in the US.<sup>13</sup> It is designed to enhance coordination of care for people with chronic disease and focuses on four concurrent strategies: self-management support; practice teams to achieve clinical and behavioural management; disease support; and clinical information systems.<sup>14</sup> Even this model may struggle with multimorbidity as its decision-support component relies on research evidence that is largely derived from studies of single diseases or conditions. Little research is available for multiple coexisting conditions, as individuals with multimorbidity are often excluded from such studies to minimise bias.<sup>15</sup> Unless specifically designed to do so, clinical information systems may fail to support multimorbidity management if they do not pay sufficient attention to outcomes of function, which may be the main concern for the patient. In addition, financial incentives in disease management programmes may encourage a focus on individuals with single chronic conditions, who may be easier to manage to achieve predefined targets.

Further interventions have been developed to address multimorbidity. These include the programme for community matrons in the UK, delivered through primary care trusts and based on nurse-provided case management.<sup>16</sup> It is similar to previous programmes delivered through social services in the 1990s. However, concerns have been expressed about achieving programme targets without real integration of primary and specialist services, and it has also been claimed that community matrons may lack the necessary power and resources to improve outcomes.<sup>17</sup> Disappointingly, a recent

evaluation of community matrons working within the EverCare model, designed to reduce admission in frail older people, found that while the quality of care improved there was no reduction in emergency admissions or mortality.<sup>18</sup>

Research on multimorbidity has been limited and has focused on describing prevalence, estimating severity,<sup>19</sup> and quality of life measures.<sup>4,20,21</sup> Any future research must include the effectiveness of single disease guidelines in patients with multimorbidity. We have yet to explore the natural history of patients with multimorbidity, which at present seems to represent the limits of the healthcare system rather than a realistic response to a common, but complex, series of health problems. So far, there has been limited research into the effectiveness of interventions to improve outcomes in patients with multimorbidity<sup>19</sup> leading to a weak scientific basis for patient management.

Clinical care of patients with multimorbidity is compounded by poor communication between primary and secondary care. Evidence from the US suggests that patients with a high morbidity burden have a higher use of specialists, even for conditions that are normally managed in primary care,<sup>22</sup> and that care in both sectors is poorly integrated.<sup>14</sup> A function-oriented approach, as opposed to a disease-oriented approach, is probably better suited to such patients. By this we mean a focus on whether a patient can function in a way that they find acceptable, as opposed to whether they have achieved a disease-related target such as blood pressure reduction. Their management requires complex clinical decision making, particularly in relation to polypharmacy,<sup>5</sup> and understanding and minimisation of potential harm associated with multiple high-tech interventions. To address these issues properly requires clinical training with a philosophy that balances good medicine, pragmatism, and a consideration of quality of life and function. Given the complexity in making diagnoses and choosing treatments it seems that a broadly-trained generalist with a good breadth of knowledge and extra time is essential. A generalist needs

the backup of a multidisciplinary team to improve function and care within the home or community. A review of coordination of care for chronic diseases in the US has highlighted the key roles of the generalist physician in coordinating care and also the role of the multidisciplinary team in integrating community and social services into the care plan.<sup>23</sup> It is evident that such patients will need to attract additional resources for the time needed to deal with complex problems.

Traditionally, specialists have managed patients with complex chronic disease referred to them by generalists. In the US, Gask has highlighted the potential of changing specialist roles in chronic disease care by moving to stepped-care programmes, such as those developed for depression.<sup>24</sup> These innovative approaches, which increase patient access to specialist expertise, are also based on single conditions but could be extended to patients with multimorbidity. Specialist physicians embedded in the multidisciplinary team, such as those looking after older people, may be in a position to support the management of multimorbidity patients in primary care. Other models may be more appropriate in different healthcare systems depending on the ability of primary care to deliver and the extent of sub-specialisation at the secondary and tertiary care levels. It would be inappropriate to adopt models of care reported in other healthcare systems without sufficient consideration of relevant contextual factors.<sup>25</sup> Whatever way care for patients with multimorbidity is organised, there needs to be a shift towards a focus on function and quality-of-life-based care as prioritised by the individuals with multimorbidity themselves. A focus on functional status rather than disease-specific outcome measures will enable assessment of response to treatment in clinical practice, but will also be more appropriate in terms of research outcomes.

Multimorbidity is generally a consequence of increased longevity and better health care. However, as it is currently approached it represents the limits of the very health care that has contributed to its existence. There has been a discussion on the rising global challenge

of the chronic disease epidemic.<sup>26</sup> Innovations to address this challenge will need to incorporate a consideration of multimorbidity and move beyond a focus on a collection of single chronic conditions. New approaches will need to recognise the existence and complexity of multimorbidity if we are to provide balanced pragmatic and cost-effective care and address the expectations of both patients and healthcare providers.

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#### REFERENCES

- Fortin M, Bravo G, Hudon C, *et al*. Prevalence of multimorbidity among adults seen in family practice. *Ann Fam Med* 2005; **3**(3): 223–228.
- Van Weel C, Schellevis FG. Comorbidity and guidelines: conflicting interests. *Lancet* 2006; **367**(9510): 550–551.
- Bayliss E, Bayliss M, Ware J, Steiner J. Predicting declines in physical function in persons with multiple chronic medical conditions: what we can learn from the medical problem list. *Health Qual Life Outcomes* 2004; **2**: 47.
- Fortin M, Lapointe L, Hudon C, *et al*. Multimorbidity and quality of life in primary care: a systematic review. *Health Qual Life Outcomes* 2004; **2**: 51.
- Townsend A, Hunt K, Wyke S. Managing multiple morbidity in mid-life: a qualitative study of attitudes to drug use. *BMJ* 2003; **327**(7419): 837.
- Bjerrum L, Søgaard J, Hallas J, Kragstrup J. Polypharmacy: correlations with sex, age and drug regimen. *Eur J Clin Pharmacol* 1998; **54**(3): 197–202.
- Noel PH, Frueh BC, Larme AC, Pugh JA. Collaborative care needs and preferences of primary care patients with multimorbidity. *Health Expect* 2005; **8**(1): 54–63.
- Bayliss EA, Steiner JF, Fernald DH, *et al*. Descriptions of barriers to self-care by persons with comorbid chronic disease. *Ann Fam Med* 2003; **1**(1): 15–21.
- Soubhi H, Fortin M, Hudon C. Perceived conflict in the couple and chronic illness management: preliminary analyses from the Quebec Health Survey. *BMC Fam Pract* 2006; **7**: 59.
- Dr Foster Intelligence. *Keeping people out of hospital: the challenge of reducing emergency hospital admissions*. London: Dr Foster Intelligence, 2006.
- Department of Health. *Improving chronic disease management*. London: The Stationery Office, 2004.
- Druss BG, Marcus SC, Olfson M, *et al*. Comparing the national economic burden of five chronic conditions. *Health Aff (Millwood)* 2001; **20**(6): 233–241.
- Lewis R, Dixon J. Rethinking management of chronic diseases. *BMJ* 2004; **328**(7433): 220–222.

- Starfield B, Lemke KW, Bernhardt T, *et al*. Comorbidity: implications for the importance of primary care in 'case' management. *Ann Fam Med* 2003; **1**(1): 8–14.
- Starfield B. New paradigms for quality in primary care. *Br J Gen Pract* 2001; **51**(465): 303–309.
- Department of Health. *Supporting people with long term conditions*. London: The Stationery Office, 2005.
- Murphy E. Case management and community matrons for long term conditions. *BMJ* 2004; **329**(7477): 1251–1252.
- Black DA. Case management for elderly people in the community. *BMJ* 2007; **334**(7583): 3–4.
- Fortin M, Hudon C, Lapointe L, Vanasse A. Multimorbidity is common to family practice: is it commonly researched? *Can Fam Physician* 2005; **51**: 244–245.
- Bayliss E, Ellis J, Steiner J. Subjective assessments of comorbidity correlate with quality of life health outcomes: initial validation of a comorbidity assessment instrument. *Health Qual Life Outcomes* 2005; **3**: 51.
- Fortin M, Bravo G, Hudon C, *et al*. Relationship between multimorbidity and health-related quality of life of patients in primary care. *Qual Life Res* 2006; **15**(1): 83–91.
- Starfield B, Lemke KW, Herbert R, *et al*. Comorbidity and the use of primary care and specialist care in the elderly. *Ann Fam Med* 2005; **3**(3): 215–222.
- Stille CJ, Jerant A, Bell D, *et al*. Coordinating care across diseases, settings, and clinicians: a key role for the generalist in practice. *Ann Intern Med* 2005; **142**(8): 700–708.
- Gask L. Role of specialists in common chronic diseases. *BMJ* 2005; **330**(7492): 651–653.
- Sheldon T. Learning from abroad or policy tourism? *Br J Gen Pract* 2004; **54**(503): 410–411.
- Quam L, Smith R, Yach D. Rising to the global challenge of the chronic disease epidemic. *Lancet* 2006; **368**(9543): 1221–1223.

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