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COMMENTARY

Managing chronic diseases in rural aged care facilities using point-of-care testing systems

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Chronic disease management

Chronic health conditions represent a significant challenge to global health[1]. By 2020, they will account for 73% of all deaths and 60% of the global burden of disease[2]. The main contributing conditions include: cancer; cardiovascular disease which mainly includes heart disease and stroke; and diabetes. Chronic disease management (CDM) has been a significant focus for many countries worldwide[1,2]. CDM is characterised by a systematic and coordinated approach from various stakeholders to provide patient-centred care[3]. Successful CDM is dependent on many aspects of health care. These include coordinated care between various organisations; using the best available evidence; support for self-management; and regular review and follow up[4].

Regular reviews of patients with chronic diseases are essential for effective disease management. Reviewing data concerning patients' perspectives of their diabetes management, together with contributions from other members of the healthcare team such as diabetes educators and nurses, will provide critical information to clinicians. Such reviews assist clinicians to set clear goals to improve patients' chronic disease management and prevent complications[5,6].

Furthermore, monitoring risk factors is the key to success for appropriate management of chronic diseases[6,7]. Most current clinical guidelines addressing chronic disease management incorporate the measurement of pathology markers such as haemoglobin A1c (HbA1c), lipids and blood pressure for diabetes and cardiovascular disease; estimated glomerular filtration rate (eGFR), blood creatinine and urine albumin: creatinine (ACR) ratio for chronic kidney diseases, and International Normalised Ratio (INR) for patients requiring warfarin therapy[8-10].

Several studies addressing chronic disease management in the aged have highlighted the fact that inadequate control of chronic diseases, such as diabetes, is due to lack of adherence

to the best practice guidelines[11-13]. Other contributing factors to the insufficient management of patients with chronic diseases include the lack of documentation of pathology results reported in patients' medical histories. A 2012 study by Khalil et al auditing diabetes management in aged care facilities highlighted the lack of complete and consistent documentation of pathology results in aged care facilities[14]. This then resulted in poor diabetes management of the residents involved and a lack of adherence to the management guidelines by prescribers[14].

Other studies addressing the management of chronic diseases by various health professionals such as pharmacists highlighted the importance of close pathology monitoring. Most of these studies involved auditing of medication management reviews and pathology results of patients with chronic diseases[15-17].

Challenges in chronic disease management in rural aged care facilities

Despite issues with research definitions and gaps in our current understanding of rural life, the evidence confirms that the rural context does present particular challenges to the aged population including the centralisation and rationalisation of already scarce services[18]. Rural and remote aged care facilities also have several challenges which have been highlighted in the literature. These include access and transport[19]. A 2012 study by Bello et al investigated the associations between remote residence location and the quality of care and adverse events experienced by people with chronic diseases such as diabetes and chronic kidney disease. They found that remote residents were less likely to access quality healthcare services, such as regular monitoring of their HbA1c and proteinuria status, at the recommended frequency. As a result, remote residents are more likely to experience adverse events such as hypoglycaemia or hyperglycaemia and renal impairment. The geographical isolation of remote areas together with the lack of accessibility of appropriate healthcare services were considered possible explanations for their findings[20].

Elderly persons who reside in aged care facilities tend to require a range of support services and most of them are unable to live independently in the community because of their complex chronic conditions[12,13]. The majority of residents are taking multiple medications which require them to be heavy consumers of medical services. Services such as the availability of GP clinics and pathology laboratories are inequitable in rural areas[20,21].

A recent report by the Australian Institute of Health and Welfare into the management of chronic disease in aged care facilities stressed the need to improve performance measurements and good quality information on health systems in aged care facilities. The report also highlighted the lack of complete pathology results for elderly residents living in aged care facilities. Having access to 'up-to-date' pathology results would have a significant positive impact on the quality of care offered in aged care facilities[21].

In addition to the above challenges, a recent report by Urbis Consultancy addressing the key areas of focus for the pathology workforce highlighted the inadequate pathology services in rural areas to deal with the increase in workload due to the increase in ageing population[22].

Benefits of point-of-care testing

Point-of-care testing (PoCT) refers to pathology testing performed in a clinical setting outside the laboratory (such as an aged care facility), at the time of patient consultation[22]. When integrated into defined clinical management pathways, there are many potential advantages of using PoCT for chronic disease management within the aged care sector. PoCT can be conveniently performed on a small portable medical device with test results available generally within a 10 minute timeframe or less. The rapid turnaround of PoCT results enables immediate and informed clinical decisions to be made and facilitates improved patient outcomes. Aged care nurses could be readily trained to conduct PoCT, which generally requires a small sample volume of less than 100 µL, enabling capillary (fingerprick) rather than venous whole

blood sampling for most tests. PoCT would provide a convenient and accessible service for aged care patients. Importantly, PoCT ensures that the patient is the central focus of the pathology service being delivered and would empower the aged care facility to have greater control of the way their pathology service and resultant health information for chronic disease is delivered and managed.

In the last 20 years, significant technological advances have occurred in the development of PoCT devices with improved test characteristics including advanced sensors, better quality manufacturing processes for test cartridges and consumables, and simplification of device operation to ensure there are minimal manual steps to enable non-laboratory health professional staff (such as aged care nurses) to be readily trained to perform PoCT to a high analytical standard[23].

Within Australia, there is now a strong evidence base that PoCT has enhanced service delivery, been clinically and culturally effective (in both chronic and acute disease contexts), and facilitated community engagement in many health sectors including Indigenous medical services, general practices, country hospitals and remote health centres[24-34]. For example, PoCT for HbA1c and urine ACR is being used widely for diabetes management in over 170 Indigenous medical service through the QAAMS (Quality Assurance for Aboriginal and Torres Strait Islander medical services) Program[24-27]. This program is the largest national PoCT network in Australia and has been funded by the Australian Government for the past 14 years. QAAMS has consistently been shown to be clinically effective, with statistically significant improvements in glycaemic control being observed both within and between rural and remote Indigenous communities[25]. The Government's recent Point-of-Care Testing in General Practice Trial focussed on the use of PoCT for management of chronic conditions in almost 5000 patients across 53 general practices spread relatively equally across urban, rural and remote locations[28-33]. PoC tests performed in this trial included HbA1c, urine ACR, lipids and INR. Based on the primary clinical outcome of percentage of patients with test results in the target range, PoC tests for HbA1c, urine ACR, total cholesterol and triglycerides were shown to be non-inferior to laboratory testing, but not for INR and HDL cholesterol[28]. The immediacy of the PoCT result was also associated with the same or better adherence to medication compared with having the result provided by the pathology laboratory, while patient satisfaction levels with the PoCT testing process were high[28,29].

In both these programs, PoCT has been shown to work just as effectively in rural/remote locations as in urban settings. Theoretically, it would seem timely and appropriate to translate the successful elements of these models into the aged care sector, particularly in regional Australia. A thorough cost–benefit analysis and an investigation into modes of service delivery in this sector would, however, be needed before making a decision to implement PoCT because there are currently no Medicare rebates available for PoCT in aged care facilities.

The keys to successful implementation of PoCT for chronic disease management would include: (i) a training and competency program for aged care nurses to enable them to be proficient at conducting on-site PoCT (including both face-to-face and web-based options for training); (ii) the establishment of a quality surveillance framework to monitor the analytical quality of testing conducted on-site, with the aim of ensuring PoCT is maintained at standard equivalent to that expected of a pathology laboratory; and (iii) the electronic capture and transfer of all PoCT results direct from the testing device to a central data station or clinical information system. This connectivity capacity is now a obligatory feature of most modern PoCT systems and is currently in use in the QAAMS and Northern Territory Point-of-care Testing Program (the latter operating in 35 remote health centres in the Northern Territory for acute and chronic care)[34]. Reliable connectivity ensures that there is no loss of patient information through manual processes, and tracking of serial changes in patient results can be monitored conveniently and analysed to assess clinical effectiveness. Incorporation of connectivity into a PoCT model for aged care would ensure complete documentation of all pathology

results which, as stated earlier, is a limitation of current aged care practice.

Another major issue concerning the care of the elderly population in Australia is the shortage of GPs available to service the increasing numbers of older Australians, with the problem being particularly acute in rural and remote regions. Faced with increasing numbers of older patients, the GP has reduced time to effectively manage their chronic diseases[28]. For those patients who reside in residential aged care facilities, this issue extends to reduced time for GPs to spend with each patient during visits. If PoCT were available at the residential aged care facility, the GP could request the appropriate PoC test during the visit, the test could be performed on the spot with the doctor then taking appropriate action immediately. This would increase clinical and operational efficiencies for the GP by saving time and minimising delay in treatment. The patient would benefit from better, more prompt disease management. PoCT would also result in improved delivery of pathology services compared with standard laboratory practices by removing the need for collection of a venous sample, generating a laboratory request, arranging transport, receiving the results and taking the appropriate delayed action on those results.

Implications for practice and research

There are many potential benefits for the use of PoCT in rural aged care facilities, especially given the shortage and high turnover of health professionals and, in some cases, the long turnaround times for receipt of pathology results from the regional laboratory provider[35]. The performance of a PoCT is a tool that aged-care health professionals can use to immediately review patients' progress and provide education on their chronic disease management, including healthy lifestyles and medication management. Rural aged care facilities would benefit from using PoCT to ensure appropriate and timely management of chronic disease for their residents, but research is needed to investigate and evaluate the clinical benefit and cost effectiveness of PoCT in aged care facilities.

Conclusion

When conducted under a quality framework, PoCT is a mode of health service delivery that can support and improve both access to quality of care and the consistency of care standards for residents with chronic diseases in rural aged care homes. In light of the identified gaps in achieving best practice management of chronic disease in older persons, we believe that it is timely to consider whether the judicious and quality-assured use of POCT can assist in the effective management of chronic disease both from the perspective of decreasing morbidity and by improving cost-efficiency.

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