Appendix 1 (as supplied by the authors): Development and use of a multidisciplinary integrated care approach, inspired by the disease management model, for elderly people in residential care facilities included in a cluster randomized trial

The Disease Management Model

The Disease Management Model is based on 3 elements: coordination of care, guiding of the care process and empowerment of the patient. A limitation of disease management for patients with multi-morbidity is the single-disease oriented perspective. Therefore, in this project among elderly with mostly multiple morbidity, we choose an expanded multidimensional or bio-psychosocial perspective which corresponds to the International Classification of Functioning, Disability and Health. For our target population we aimed to improve or maintain the functional health status by providing continuity of care, being patient oriented, generating multidimensional health data on residents, executed by appropriately trained professionals who design a shared disease management plan and is supported by Information Communication Technology.

The Disease Management Model in residential care facilities

In residential care facilities, implementation of the three elements of the Disease Management Model demanded specific adaptation and agreement across the responsible players. For example, who is best suited to do the guidance and coordination? Family physicians are responsible but do not regard themselves suited for systematic management and long-term monitoring for chronic diseases and disabilities associated with frail health. In residential facilities, nurse assistants have daily contact with the frail elderly and are well positioned to coordinate the care. Appropriate care coordination demands up to date and state of the art medical and social input. Guidance and medical input is needed by regular contact with the primary care physician. However, primary care physician often skip team meetings as they can be at impractical times, or have unclear agenda's which greatly limits its potential value.

To increase the quality of the team meetings, primary care physician should be present, and nurse assistants could be trained to bring forward relevant medical observations. Also, a consultant such as a geriatrician or other old age specialist may be invited to provide state of the art advice. This approach demands empowerment of residential staff by systematic observation and effective communication with medical professionals.

In addition, the issue of patient empowerment can be problematic. For example, about half of the residents suffer from dementia which greatly limits the potential for patient empowerment.

The Multidisciplinary Integrated Care model

Therefore, we developed Multidisciplinary Integrated Care inspired by the disease management model. Multidisciplinary Integrated Care focused on identification and monitoring of the functional disabilities caused by chronic diseases. The three basic elements of Multidisciplinary Integrated Care correspond to the Disease Management Model: monitoring of disabilities, coordination of care, and empowerment. The latter is normally applied to patients only. As nurse-assistants provide all basic nursing care we wanted to empower them in monitoring and coordination of care.

The intervention

In the intervention homes we made Multidisciplinary Integrated Care operational in the process of care in three sequential steps:

1. Firstly a three-monthly in-home systematic and computerized multidimensional assessment of all residents by staff (nurse) who systematically identifies the functional health status and care needs. For this purpose, the Long Term Care Facility version of the Resident Assessment Instrument was used. The Resident Assessment Instrument was originally designed as a minimum data set to assess the health needs of nursing home residents. The Resident Assessment Instrument provides a comprehensive overview of the person's physical, psychological, behavioural and social status. Moreover it indicates a global level of care need which distinguishes persons who do not need care, from those who need personal care, home care, extramural home care or nursing home care. The computerized Resident Assessment Instrument produces an easy and direct overview of problems in 18 areas that may need specific care planning. The identified problem areas guide the design of an optimal individualized care plan. In a multidisciplinary team, all disciplines involved in care for the resident, will participate in regular meetings in order to evaluate the Resident Assessment Instrument findings and design and monitor the (tailor made) care-plan. The care plan aims to improve or maintain the functional health status and is focused at modifiable risk factors of the resident.

Appendix to: Boorsma M, Frijters DHM, Knol DL, et al. Effects of multidisciplinary integrated care on quality of care in residential care facilities for elderly people: a cluster randomized trial. *CMAJ* 2011; DOI:10.1503/cmaj.101498.

2. Secondly, the assessment outcomes were discussed in a multidisciplinary meeting in the homes with the family physician, nursing home physician, nurse, Psychotherapist and other involved disciplines. In the multidisciplinary meetings individualized care plans were made to treat modifiable disabilities and identify and eliminate (when possible) risk factors. Residents with complex care needs were scheduled ate least twice a year for a multidisciplinary meeting with the nurse-assistant, primary care physician, geriatrician, psychologist and home manager. Members of the multidisciplinary meetings received the outcomes of the latest assessment one week before the meeting. Meetings were scheduled at a convenient time for the primary care physician. New actions and care plan changes resulting from the discussion during the meeting were noted on the care plan and evaluated and coordinated by the responsible nurse-helper. The home manager planned the agenda.
3. Thirdly, a consultation by geriatrician or psychologist was optional for the frailest residents with complex health care problems.
4. Finally, home managers received a benchmark report every three months comparing their home with other homes that assess with the same instrument their residents on 32 risk adjusted risk indicators of quality of care. Management can use this overview to improve specific areas of care. For example, if the number of falls is substantially higher compared to the average (benchmark), management can decide on measures to improve safety in a particular home. The association of users of in the Netherlands, owns the software, and provides these overviews for a limited tariff per resident (www.nedrai.nl).

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