



Health@Home

**A new paradigm for prevention
and chronic disease management**

**Health@Home service concept:
A physician's perspective**

Speaker

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HEALTH CENTRE OF VYRONAS

A pilot Primary Health Care Centre



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Help at Home for Aged People

- **Continuously augmenting elderly population**
- **Medical expenditures for home health care are exponentially raising every year**

Mauser E. Medicare Home Health initiative: current activities and future directions.
Health Care Financ Rev. 1997;18:275-291.

Help at Home for Aged People

- Health care organizations worldwide are being encouraged to find more efficient methods of providing high-quality care with cost savings.
- The number of people >85 years of age is expected to increase at least 6-fold by 2050.

Treas J. Family support systems for the aged: some social and demographic considerations. *Gerontologist* 1977;17:486-91.

Crimmins EM, Ingegneri DG. Interaction and living arrangements of older parents and their children: past trends, present determinants, future implications. *Res Aging* 1990;12:3-35.

Treas J. The great American fertility debate: generational balance and support of the aged. *Gerontologist* 1981;21:98-103.

Cantor MH, Little V. Aging and social care. In: Binstock RH, Shanas E, eds. *Handbook of aging and the social sciences*. 2nd ed. New York: Van Nostrand Reinhold, 1985.

Steinbach U. Social networks, institutionalization, and mortality among elderly people in the United States. *J Gerontol* 1992;47:S183-S190.



Help at Home for Aged People

- **Longer life spans,**
 - **Declining birth rates,**
 - **Expanding role of women in the work force,**
 - **Breakdown of the extended family**
 - **have all been cited as reasons for the increasing number of elderly people at risk for institutionalization**
 - **...yet elderly people clearly prefer independent living to institutionalization.”””**
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Help at Home for Aged People

- **Elderly people who live alone may fear being unable to obtain help if they are injured or ill**
 - **For many families, the specter of such an event can dominate decisions about living arrangements**
 - **This fear has generated an industry, marketing IT-based @home service systems**
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- **Health care providers & emergency-medical-services personnel are sometimes called on to assist when elderly people are found in their homes in need of emergency and unable to summon help**
- **In a typical case:**
 - **a neighbour notices an elderly person's absence or the fact that mail has piled up and calls emergency services.**
 - **The precipitating incident can be a fall, a stroke, failure to thrive, or some other event.**
- **The clinical course for persons found alive but incapacitated is often complicated and the prognosis for such elderly patients is poor.**



CDC
National Center for Injury Prevention & Control,
Division of Unintentional Injuries Prevention

- Fall-related injuries are the leading cause of injury deaths and disabilities among older adults (i.e., persons aged ≥ 65 years)
 - One half of all older adults hospitalized for hip fracture never regain their former level of function
 - In 1996, a total of 340,000 hospitalizations for hip fracture occurred among persons aged ≥ 65 years
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The economic cost of hip fractures among elderly women Belgian Hip Fracture Study Group

- A prospective, observational cohort study with matched-pair analysis
- The costs of treating a hip-fracture patient are about 3x greater than those of caring for a patient without a fracture
- This also highlights the savings to society if a hip fracture can be avoided.



Help at Home for Aged People

- **Maintenance of the home becomes more difficult with increasing disability and extreme age**
- **Failure to achieve regular maintenance leads to more extensive and costly repairs in the future**
- **Studies have demonstrated that the mortality of older people living at home is strongly affected by housing conditions.**

Reschovsky JD, Newman SJ. Home upkeep and housing quality of older homeowners. *J Gerontology* 1991;46:S288-97.

Zhao L, Tataru K, Kuroda K, Takayama Y. Mortality of frail elderly people living at home in relation to housing conditions. *J Epidemiol Community Health*. 1993;47:298-302.

Help at Home for Aged People

- **The objective of enabling older people to remain in their own homes has been a cornerstone of government policy for several decades**
 - **Independence in their own homes is desirable for most people**
 - **But illness and disability in later life may make this impossible unless aids are provided and adaptations made to the home**
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Help at Home for Aged People

- **Due to the great importance of the issue:**
 - **One of the proposals for revision of the United Kingdom Building Regulations includes a special provision:**
 - **Making all new homes adaptable so that occupants who may become ill or disabled in the future may continue living in them.**
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Help at Home for Aged People

- **A safe,**
- **Convenient,**
- **Sound and**
- **Healthy living environment**

- **is the prerequisite for a good house for the elderly people with special needs**
- **The intention of making a house in such a way is that it solves basic problems of fixture and fittings**



- **Study investigating on the adaptability of houses in the UK**
- **Controlled the largest British house-building companies**
- **Assessed the extent to which their homes are capable of easy modification in the future**
- **Results showed that only 3% of companies had designed and built adaptable housing**
- **Currently, adaptable housing for those seeking 'homes for life' is not a high priority of building companies, a fact which delineates the open-to-innovation market area.**

J. P. Frain, P. H. Carr. Is the Typical Modern House Designed for Future Adaptation for Disabled Older People? *Age and Ageing* 1996:25:398-401.



Help at Home for Aged People

One of the most important mediators in achieving the goal of assisting elderly people in their home environment is through the use of

Assistive Devices (AD)



- **Studies have demonstrated that ADs significantly improve performance of daily activities in both women and men**
- **The use of ADs has been reported to reduce difficulty in performing everyday tasks and significantly assist living**
- **Such results indicate a current but mainly future need for specific assessment and intervention with regard to Ads due to the augmenting elderly population**
- **In some countries the community subsidizes the costs for ADs and organizes their distribution to the users**

Thyberg I, Hass U, Nordenskiöld U, Skogh T. Survey of the Use and Effect of Assistive Devices in Patients With Early Rheumatoid Arthritis: A Two-Year Followup of Women and Men. *Arthritis & Rheumatism (Arthritis Care & Research)* Vol. 51, No. 3, June 15, 2004, pp 413-421.
Mann WC, Hurren D, Tomita M. Assistive devices used by home-based elderly persons with arthritis. *Am J Occup Ther* 1995;49:810-20.



➤ **Telemedicine/Telemonitoring/Telesurveillance:**

- **A technologically based modality that allows the surveillance of patients in the natural setting, mainly home**
- **It is based on communication technologies to relay information between a patient and a central call centre where services are coordinated**
- **Different types of telehealth systems have been implemented**
 - some being staffed with non-health professionals
 - and others with health professional, mainly nurses
- **Up to now, mainly telehealth services staffed with non-health professionals have been shown to be effective and efficient**

Vincent C et al. Public telesurveillance service for frail elderly living at home, outcomes and cost evolution: a quasi experimental design with two follow-ups. *Health and Quality of Life Outcomes* 2006, 4:41.

Help at Home for Aged People

- **Several studies for the outcomes & cost evolution of nurse-staffed telesurveillance system for elderly living at home showed:**
 - **That patient satisfaction was very high**
 - **Caregivers' psychological burden decreased substantially**
 - **Length of hospital stays and home care services decreased**
 - **Total cost of health & social public services used per patient also decreased**
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Help at Home for Aged People

Registering older adults at a telesurveillance center staffed by HCW, upon a health professional recommendation, actually costs the health care system less and does not have any negative effects on the well-being of the individuals and their families

In other words, Telesurveillance for the elderly is effective & efficient

Puskin DS, Sanders JH. Telemedicine infrastructure development. *J Med Syst.* 1995;19:125-129.

Perednia DA, Allen A. Telemedicine technology and clinical applications. *JAMA.* 1995;273:483-488.

Johnston B et al. Outcomes of the Kaiser Permanente Tele-Home Health Research Project. *Arch Fam Med.* 2000;9:40-45.



- **Technology has the potential to affect cost savings when used to substitute some inperson visits and can also improve access to home health care staff for patients and caregivers.**

 - **Significant improvement in:**
 - **medication compliance,**
 - **knowledge of disease,**
 - **ability for self-care,**
 - **extent of use of services,**
 - **degree of patient satisfaction,**
 - **direct and indirect costs**
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- **Similar studies performed for assessing the effectiveness:**
 - **Of AT & EI in maintaining independence and reducing home care costs for the frail elderly**
- **Mainly considered indicators such as:**
 - **Functional status** *as measured by the Functional Independence Measure,*
 - **Pain** *as measured by the Functional Status Instrument*
 - **Health care costs**
- **Have all demonstrated positive and promising results.**



Help at Home for Aged People

**In conclusion, home ambient/environmental adaptations
as well as assistive technologies
can substitute and supplement care.**

Sonn U et al. Assistive devices in an elderly population studied at 70 and 76 years of age. *Disabil Rehabil* 1994;16:85-92.
Hass U et al. Assistive technology assessment: a study of user participation in the selection process at rheumatoid arthritis. *IEEE Trans Rehabil Eng* 1995;3:263-75.



Help at Home for Aged People

For many older people such adaptations and assistive technology can be cost effective

Pay-back periods from investment in adaptations and assistive technology can be quite short.



Barriers of providing Health@home services

- Acute care model of the current health care system
 - Lack of integrated information systems
 - Lack of provider(s) support
 - Limited resources
 - Danger of fragmentation of care
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A snapshot of the Aging European population in numbers

- <30% of patients with hypertension achieve targets
 - <50% of patients with diabetes achieve target HgA1c (<0.7)
 - 60 % of patients with asthma are poorly controlled
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Persons found helpless at home

23% dead/ 5% died in the hospital/ 62% found alive admitted to the hospital

62% of survivors unable to return to independent living

Mortality 28% (67% for helpless >72h, 12% for helpless for <1h)

Gurley RJ et al. Persons found in their homes helpless or dead. N Engl J Med 1996;334:1710-6.

RCT: unrecognized locomotor disability detected on screening of elderly people (>85) living independently. Providing aids offers feasible & cost effective means of improving function.

Hart D, Bowling A, Ellis M, Silman A. Locomotor disability in very elderly people: value of a programme for screening and provision of aids for daily living. *Br Med J* 1990;301:216-20.

RCT for the evaluation of a system of AT-EI services: Functional status assessment: Reduce rate of decline - reduce costs for institutional and in-home personnel.

Mann WC et al. Effectiveness of Assisting Technology and Environmental Interventions in Maintaining Independence and Reducing Home Care Costs in the Frail Elderly. *Arch Fam Med* 1999;8:210-217.

Cross-sectional study of 2368 community dwellers >65 years: use of equipment and of assistive technology was associated with fewer hours of personal assistance.

Hoening H et al. Does Assistive Technology Substitute for Personal Assistance Among the Disabled Elderly? *Am J Public Health*. 2003;93:330-337 .



RCT: To evaluate the use of remote video technology in the home health care setting in elderly patients with chronic diseases

No differences in quality measures

(Medication compliance, Knowledge of disease, Ability of self-care, Degree of patient satisfaction)

Remote video technology in home care setting: Effective, Well received by patients, Capable of maintaining quality of care, Potential for cost savings.

Johnston B et al. Outcomes of the Kaiser Permanente Tele-home Health Research Project. *Arch Fam Med* 2000;9:40-45

957 calls for 38 clients over a 6-month period, 48 (5.0%) of calls were health-related

No change in the elders' quality of life & daily activity abilities

Satisfaction was very high: Caregivers' psychological burden decreased

length of hospital stays dropped from 13 to 4 days,

home care services decreased from 18 to 10 visits/client

total cost of health & social public services used per client dropped by 39%

Vincent C et al. Public telesurveillance service for frail elderly living at home, outcomes and cost evolution: a quasi experimental design with two follow-ups. *Health and Quality of Life Outcomes* 2006, 4:41.

Out-of-pocket expenses

- RCT: Home care visits in non-institutionalized elderly patients in need of care,
- 20% received formal paid in-home visits for services from paid helpers
- 76% non-skilled caregivers, 19% skilled caregivers, 5% both types, 4 visits per week
- Poorer quality of provided services - Higher out-of-pocket expenses

Coughlin TA et al. Home Care for the disabled elderly: Predictors and expected costs.
Health Services Research 1992;27(4):453-479.



Advanced Wireless Sensor Network for Health Monitoring

No false detections, necessity of enhancing power management/autonomy

Virone G et al. An Advanced Wireless Sensor Network for Health Monitoring. Harvard University. CodeBlue project: *Wireless Sensor Networks for Medical Care*, Impact Lab. Department of Computer Science and Engineering, ASU

Feasibility and cost of AT adaptations: scope to substitute & supplement formal care

(Measures: home adaptability, costs of care, adaptations and AT, and costs relationships)

Targeted adaptations and AT can facilitate independence in the living environment

They substitute traditional formal care services & supplement them in a cost-effective way

Lansley P et al. Can adapting the homes of older people and providing assistive technology pay its way? *Age and Ageing* 2004; 33: 571–576.

Houses should be adaptable to allow elderly to remain at home & minimize the cost of care

Most companies do not design their houses to be adaptable

Demand for adaptable housing is currently low

Ahasan R, Campbell D, Salmoni A, Lewko J. Ergonomics of Living Environment For the People with Special Needs. *Journal of Physiological Anthropology and Applied Human Science* 2001;20(3):175-185.

Frain JP, Carr PH. Is the Typical Modern House Designed for Future Adaptation for Disabled Older People? *Age and Ageing* 1996;25:398-401.

What do patients want?

- *An improved level of communication*
 - *To be linked to a variety of health and support services.*
 - *Appropriate, and quality health-care timely*
 - *Accessible services.*
 - *The better use of information technology*
-

Remaining questions...

- Is H@H truly cost-effective in a heterogeneous patient population with a forthcoming and straightforward analysis of the economic data?
 - Does H@H improve clinical outcomes?
 - Does H@H improve subjective outcomes such as quality of life and patient satisfaction?
 - Does H@H improve provider(s) satisfaction with the care they are able to provide?
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Chronic Disease Prevention

Chronic Disease

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Contact Info

Centers for Disease Control and Prevention
National Center for Chronic Disease Prevention and



Featured Items:

- [2005 National Youth Risk Behavior Survey \(YRBS\), Released June 8, 2006](#)
Fewer High School Students Engage in Health Risk Behaviors; Racial and Ethnic Differences Persist
- [World No Tobacco Day](#)
The theme of this year's World No Tobacco Day event in the United States is the role of health professionals in tobacco control.

Chronic diseases—such as heart disease, cancer, and diabetes—are the leading causes of death and disability in the United States. These diseases account for 7 of every 10 deaths and affect the quality of life of 90 million Americans. Although chronic diseases are among the most common and costly health problems, they are also among the most preventable. Adopting healthy behaviors such as eating nutritious foods, being physically active, and avoiding tobacco use can prevent or control the devastating effects of these diseases.

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Chronic Disease Awareness

As of June 10, approximately 747,443 people have died from chronic disease this year.

Programs & Campaigns

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- > [Cancer Control](#)
- > [Diabetes](#)
- > [Genomics](#)
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- > [Tobacco](#)
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Conclusions

Independent living is probably something most people have taken for granted during most of their life.

As people become older though, independent living can be a challenge.

Many older adults say they'd like to live independently as long as they can but the definition of independent living changes as people become older.

What steps can someone take to ensure independent living for the longest possible?

And, in case someone needs assistance, what kinds of services are available in order to help someone meet personal goals?



Conclusions

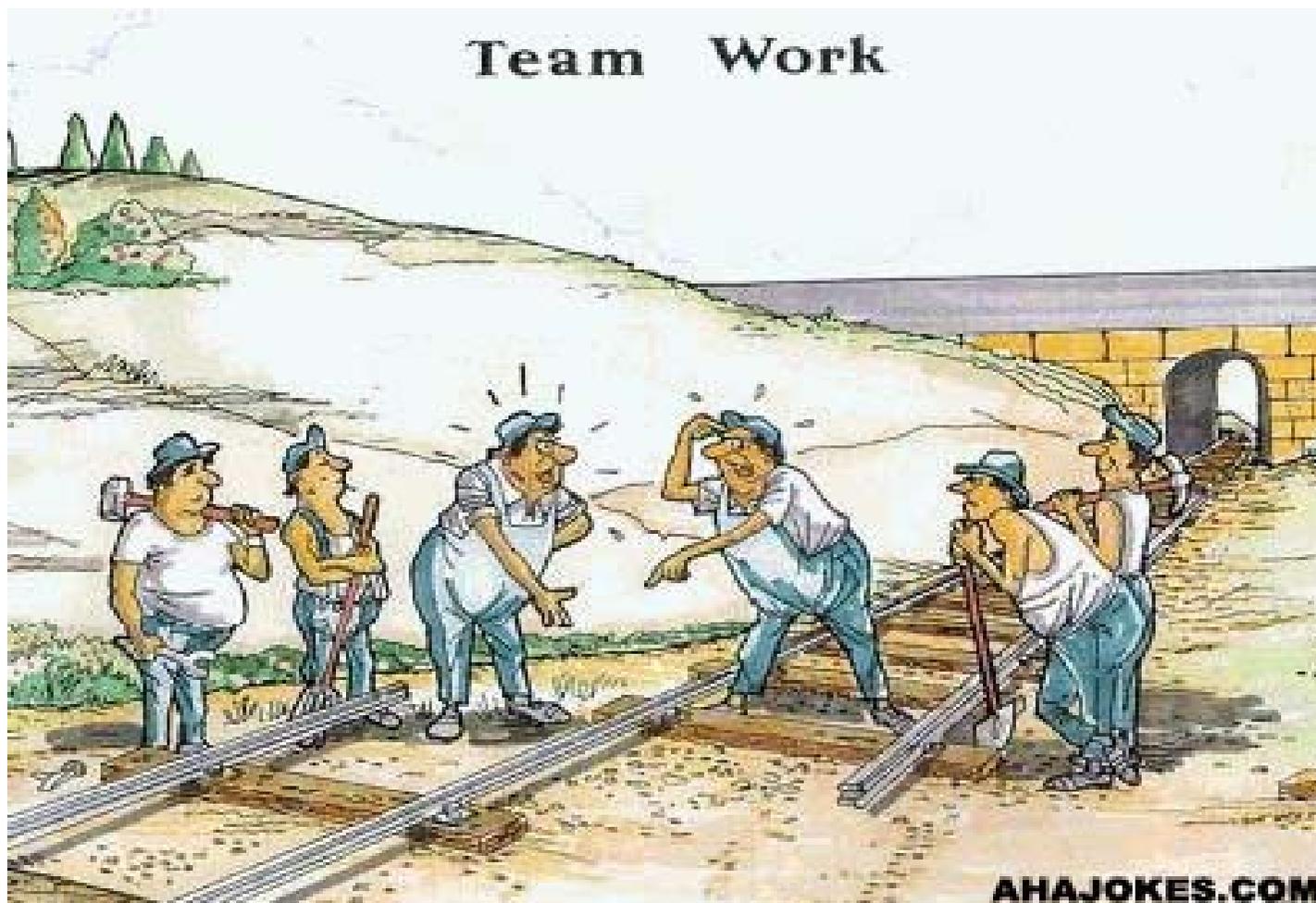
Innovative communication technologies in healthcare paired with assistive technologies and environmental interventions

can be an asset for patients and providers

and also be a part of a continuous planning for quality improvement and better and more holistic care.



Risks of not working together...





Thank you for your attention...
