SIPA
Results of a 22 month Randomized Controlled Trial on an Integrated System of Care for Frail Older Persons
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Characteristics of Older Persons with disabilities

- Generally over 75
- Disabilities in ADL/IADL
- Acute and chronic medical problems
- Importance of social network
- Frequent transitions: community, hospital, rehab, NH
- Need for a complex combination of medical and social services
Why Integration

◆ Increase in number of older persons
◆ Frail older persons need a complex combination of health and social services
◆ Present difficulty in management
  – Fragmentation; unmet needs; underutilization of effective geriatric and care management interventions; parallel play-medical, community services; problem in quality of care; negative incentives; inappropriate use of resources; absence of “comprehensive” and responsibility and accountability
Why Integration$^2$

- Increasing evidence of the effectiveness of treatment and care management in frail older persons
- Single entry point (coordination) represents an improvement
- Points to a need for a shift in paradigm
  - Align governance and allocation of resources with clinical goals
Challenge

- Present level of fragmentation
- Potential impact on health outcomes, quality of life, utilization and cost of services

How to ensure:
- **Cost-effective intervention in a coherent system of care**
Integration/Coordination
Demonstration projects

International
◆ Pace/On Lok (USA)
◆ S/HMO
◆ Bernabei (Italy)

Canada
◆ CHOICE
◆ Bois-Francs-PRISMA
◆ SIPA

Bodenheimer, NEJM 1999;341:1324-1328
Bernabei et al, BMJ 1998;316:1348-51
Newcomer et al, JAGS 2000;48:829-834
Bergman et al, CMAJ 1997;157-1116-1121
SIPA
The Process

◆ Partnership
  – Ministry and Regional Board decision-makers and administrators
  – Hospital, home-care and Nursing Home managers
  – Clinicians
  – University-based researchers
◆ Advisory board
◆ Interdisciplinary committee on clinical practice
Characteristics of the SIPA Integrated System of Care for the Frail Elderly¹

- Community primary care based system responsible for the full range of services
  - Health and social services, acute and long-term care: community, hospital and institutional

- Responsibility (health outcomes, utilisation) for a defined population on a defined territory

- Consolidated case management, in partnership with Family MD, with clinical responsibility and accountability, for the full range of services; integration of medical and social care based on evidence based interdisciplinary protocols
Characteristics of the SIPA Integrated System of Care for the Frail Elderly²

◆ A responsive organization able to mobilize resources flexibly and rapidly to meet needs, avoid inappropriate utilization
  – Increased intensity of community care
  – Early detection and intervention (medical, rehabilitation, social)
  – Rapid communication/response; on call; provider linkage

◆ Pre-payment with per capita budget with financial responsibility for the full range of services (not implemented in demonstration project)

Universal, single payer, publicly managed
SIPA
Demonstration Project and Evaluation

◆ Study the feasibility, effectiveness and cost-efficiency of SIPA as a system of care for the frail elderly

◆ Determine the modifications necessary for its generalization
The SIPA Demonstration Project

A randomized controlled trial of 1230 frail elderly randomized to SIPA system of care or usual care on 2 sites in Montreal, Canada

- research, planning 1995-98
- Organization of demonstration project 1/6/98 – 31/5/99
- RCT 22 months - 1/6/99 – 31/3/01
SIPA: Hypotheses¹

◆ The transformation (integration) of the management of frail elderly persons supported by the intensification of the community intervention will change the configuration of utilization by decreasing acute hospital (hospital days and ED use) and LTC institutional utilization.

◆ Public per capita costs in the SIPA group, including the grant, will be equivalent or decreased compared to the control group.
SIPA: Hypotheses\(^2\)

- No change in health or functional outcomes
- Equivalent or improved quality of care
- Increased satisfaction, no increased burden or private costs in the SIPA group
### Hypothesis

Hypothesis: cost per patient in SIPA group (including grant) will be equal to the cost per patient in the control group.

The higher cost of SIPA at the community service level will be “offset” by reduced hospital and LTC costs.
SIPA Intervention¹
Staff

◆ 2 multidisciplinary teams per site
◆ 160 patients per team
  – 4 case managers (nurse or social worker)
  – 2 community nurses
  – 0.5 SW
  – 0.5 OT
  – 0.5 PT
  – 15 home makers
  – 0.5 consultant pharmacist in one site
  – Part-time staff physician
SIPA Intervention²
Physicians

◆ Patients encouraged to continue with own community family physician (mainly office-based)
  – Usual fee-for-service plus $400/SIPA/patient/year

◆ Part-time SIPA staff physician
  – Salary
  – Small SIPA primary care case load
  – Backup and resource to team and community family physician (e.g. for urgent or more intensive intervention)
  – On site geriatric consultation in one site
SIPA Intervention³
Assessment and management

- Multidisciplinary team responsible for assessing needs, organizing and delivering most of health and social services in community in collaboration with primary care physician
- Comprehensive geriatric assessment on entry
- Evidence based interdisciplinary protocols development
  - Nutrition, falls, CHF, dementia, depression, medication, vaccination
- Rapid communication, mobilisation of resources
  - Intensive home care, group homes
- 24 hour nurse on call with MD backup
SIPA Intervention⁴
Case Management

◆ Consolidated case management with multidisciplinary team
◆ Intervention with patients and caregivers
◆ Liaison with family MD and specialists
◆ Maintain clinical responsibility
◆ Actively followed patients throughout trajectory of care including in hospital
  – Assure continuity
  – Ease transitions
SIPA Intervention\textsuperscript{5}

Accountability

- 2 sites based in CLSCs but distinct budget, personnel, governance
- Clinical responsibility and accountability for utilization in community, hospital, etc.
- Monitoring of application of protocols and service utilization
- Agreements, mainly informal, with other providers
- Controlled budget allowing for intensive and flexible utilization of home services, group homes, additional services based on clinical assessment
- Per capita budget with full financial responsibility not implemented
Control Intervention

- Usually CLSC home care
- Multidisciplinary team evaluation based primarily on service provision
- Services: nursing, social services, support care; limited PT, OT, MD generally limited to several hours per week
- Essentially no case management
- No on call; limited weekend availability
- Little continued/flexibility over budget; no budget for group homes
- No responsibility/accountability for clinical and utilization outcomes outside of home care services.
SIPA Demonstration Project
Feasibility

- Clinical responsibility of SIPA, regardless of location
- Full range of services
- Clinical responsibility to enhance continuity
- Flexible use of alternative resources
- Rapid response to emergency situations
- Intensive community medical intervention, closely linked to social intervention
SIPA Evaluation – Research Topics

SIPA Program

Structure & Process
- implementation & organization

Output
- service utilization & costs

Outcomes
- health impact

Quality of care
SIPA Inclusion Criteria

- Age > 64
- Community dwelling
- Participant or caregiver competent in French or English
- Caregiver participation (if applicable)
- Score of 10 or more on SMAF* (at least moderate disability in IADL or ADL)
- No pending SNH admission or move out of CLSC area

* Hébert et al. Age and Ageing 1988; 17(5) 293-302
Recruitment and Randomization

Assessed for eligibility (n=2031)
- Excluded (n=722)
  - Not meeting inclusion criteria (n=194)
  - Refused to participate (n=503)
  - Other reasons (n=25)

Randomized (n=1309)

Allocated to SIPA (n=656):
- Received allocated intervention (n=606)
- Did not receive allocated intervention (n=50)
  - Deceased (14), withdrew (17), moved away (5), institutionalized (14) prior to baseline

Allocated to Control group (n=653):
- Received allocated intervention (n=624)
- Did not receive allocated intervention (n=29)
  - Deceased (17), withdrew (4), moved away (1), institutionalized (7) prior to baseline

Lost to follow-up (n=165)
- Deceased (116), withdrew (13), moved away (36)
Discontinued intervention (n=9)
  - Non renewal 1 (9)

Lost to follow-up (n=179)
- Deceased (127), withdrew (15), moved away (37)
Discontinued intervention (n=51)
  - Non renewal (n=51)
SIPA Primary Outcome Measures

Utilisation (admissions, total days/hours) and public costs

◆ Institutional services
  - ED
  - inpatient acute care
  - Day surgery
  - alternate level care (ALC)*
  - skilled nursing home (SNH)
  - Rehab

◆ Community services
  - home health care and home social care
  - MD, medications, technical aids
  - Group homes

* Patients who after their acute hospital episode cannot return to the community and who await SNH placement in an acute hospital bed (“bed-blockers”)
SIPA Secondary Outcome measures

- Health status
- Satisfaction with care
- Out-of-pocket expenses
- Caregiver burden
SIPA Sample Size Calculation

- Powered ($\beta = 0.9$) to detect outcome (admissions, length of stay, costs) differences of:
  - 25% hospital
  - 50% SNH
  - At 95% significance level ($\alpha = 0.05$)
  - Taking into account expected mortality, refusals to participate and moves out of CLSC areas
  - Based on previous study of resource use in the frail elderly*

*Béland et al. Vieillir dans la communauté: Santé et autonomie, Rapport de recherche PNRDS #6605-4570-602, Montréal 1998*
SIPA Evaluation - Sources of Data

- Client (2) & caregiver (1) interviews
- Administrative and clinical records of service providers: SIPA, CLSC, hospital, LTC institutions, etc
- Provincial administrative databases: RAMQ, Ministry, Regional Board
- Qualitative evaluation of implementation, organization, quality of care
SIPA - Data Analysis

- Outcome differences tested using multivariate response models:
  - Allow for correlated dependent variables
  - Bivariate and continuous variables used in same model
- Differences in costs tested on users
- All cost and length of use data skewed → log-transformed
- Controlled for socioeconomic factors, health, study site
- Supplemental analyses to test for interactions:
  - Trial status with socioeconomic factors
  - Trial status with health (costs only)
- Intention to treat
### SIPA and control group participant characteristics at baseline

<table>
<thead>
<tr>
<th></th>
<th>Value range</th>
<th>Control Average or %</th>
<th>SIPA Average or %</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Socioeconomic Characteristics at baseline</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Age (years)</td>
<td>Range: 64-104</td>
<td>82</td>
<td>82</td>
<td>0.52</td>
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<tr>
<td>Gender</td>
<td>% males</td>
<td>28%</td>
<td>29%</td>
<td>0.61</td>
</tr>
<tr>
<td>Education</td>
<td>% high school and over</td>
<td>70%</td>
<td>68%</td>
<td>0.61</td>
</tr>
<tr>
<td>Income sufficiency</td>
<td>% with sufficient income</td>
<td>34%</td>
<td>35%</td>
<td>0.70</td>
</tr>
<tr>
<td>Live alone</td>
<td>% alone</td>
<td>40%</td>
<td>44%</td>
<td>0.20</td>
</tr>
<tr>
<td><strong>Health Status at baseline</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of chronic diseases</td>
<td>Range: 0-16</td>
<td>5.0</td>
<td>4.9</td>
<td>0.49</td>
</tr>
<tr>
<td>Functional limitations</td>
<td># performed with difficulties</td>
<td>3.3</td>
<td>4.0</td>
<td>0.07</td>
</tr>
<tr>
<td>ADL disabilities</td>
<td># not performed or with help</td>
<td>3.1</td>
<td>3.1</td>
<td>0.70</td>
</tr>
<tr>
<td>IADL disabilities</td>
<td># not performed or with help</td>
<td>4.4</td>
<td>4.4</td>
<td>0.95</td>
</tr>
<tr>
<td>Incontinence</td>
<td>% with incontinence</td>
<td>46%</td>
<td>41%</td>
<td>0.12</td>
</tr>
<tr>
<td>Cognitive problems</td>
<td>% with 3+ on SPMSQ</td>
<td>32%</td>
<td>31%</td>
<td>0.59</td>
</tr>
<tr>
<td>Depression</td>
<td>% with 10+ on GDS</td>
<td>14%</td>
<td>12%</td>
<td>0.41</td>
</tr>
<tr>
<td>Perceived Health</td>
<td>% with good to excellent</td>
<td>51%</td>
<td>53%</td>
<td>0.51</td>
</tr>
</tbody>
</table>
Results

Quality

◆ ↑ satisfaction/perception of quality for SIPA caregivers*; no difference for patients

◆ Qualitative study of 20 cases
   – convergence on perception of quality and innovation
   – room for improvement in management of certain problems (diabetes, falls, depression, CHF, medication…)
   – clinical responsibility
   – integration of medical services with the interdisciplinary team is possible but remains a significant problem
   – the analysis of “critical incidents” does not reveal poor management

* statistically significant
Results

Health and Burden

- Health outcomes – no difference
- Mortality – no difference
- No increase in burden or private costs to patients and caregivers
Results (22 months 99/06/01-01/03/31)

Community Services Utilization

- ▲ home health and social care accessed *
- ▲ 62% hours of care and ▲ 64% cost for SIPA users of home health care *
- No difference in social care hours

*statistically significant
Results  
(22 months 99/06/01-01/03/31)

Institutional Services Utilization

- ↓ 50% acute care patients to ALC *
- No difference in ED visits/ hours, acute hospital and SNH admissions/days

*statistically significant
Patients awaiting placement in acute care hospital

(22 months 99/06/01-01/03/31)

Control: 10%
SIPA: 5%
P(diff.)=0.001
Results
Combined Community and Combined Institutional Costs (Users)

◆↑ 44% Community*

◆↓ 22% Institutional*

*statistically significant
# Average Costs per Study Participant

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<thead>
<tr>
<th></th>
<th>SIPA</th>
<th>Control</th>
<th>Differences</th>
</tr>
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<td>Community</td>
<td>12,695</td>
<td>9,301</td>
<td>+ 3,314</td>
</tr>
<tr>
<td>Institutional</td>
<td>23,544</td>
<td>27,314</td>
<td>– 3,770</td>
</tr>
<tr>
<td>Total</td>
<td>36,240</td>
<td>36,615</td>
<td>– 375</td>
</tr>
</tbody>
</table>

Services communautaires: Médicaments, visites médicales, soutien à domicile, résidences protégées, appareils techniques, hôpitaux de jours.

Services institutionnelles: Hospitalisation de courte durée, hospitalisation d’un jour, hébergement, urgences hospitalières, réadaptations institutionnelles, soins palliatifs.
Average Costs per Study Participant of Total Community and Institutional Services
(22 months 99/06/01-01/03/31)

<table>
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Supplemental Analysis

- ↑ home health care costs participants with > 4 chronic diseases*
- ↓ acute hospital costs for participants with moderate to severe ADL disability*
- ↓ SNH costs participants < 4 chronic diseases*
- ↓ SNH costs participants living alone*

*statistically significant
Principal SIPA Impact

- **↓** utilization of hospital and SNH utilization in SIPA group
  - As expressed by the **↓** combined costs of hospital and SNH
  - Driven by decreased ALC “admission”; **↓** N.S. differences in utilization in other areas such as ED

- **↓** hospital utilization for those with increased ADL disability

- **↓** use of hospital as conduit for SNH placement

- Delaying SNH placement for those with few chronic diseases (lesser risk) and those living alone (higher risk)

- Cost neutral
Study Strengths

- Demonstrated feasibility of assessing major change in a system of care of delivery and organization for older persons with disabilities

- Strengths include:
  - Only RCT of its kind in North America
  - Largest of its kind (N=1230)
  - Longest trial period (22 months)
  - Follows CONSORT Guidelines
  - Clinical and organisational model
Study Limitations

- Powered to test for large differences of 25 to 50% → failure to demonstrate significance of some trends
- No lead in time to allow for adjustments to new care model, or familiarization with it
- Limited physician availability
- Financial accountability not implemented, limiting incentives to reduce utilization
- Possible contamination between SIPA and control teams
- Increase in home care budget concurrent with trial
Conclusion

The number of elderly and frail elderly, their need for a complex combination of health and social services and the present difficulty in managing their care suggests the need for a paradigm shift to:

- Understand the needs and their evolution
- Meet their needs
- Be cost effective
Conclusion²

The results of this and other trials demonstrate the potential to change the configuration of utilization of services in a cost-effective manner while maintaining or improving quality and satisfaction for this group of the population which needs a complex combination of health and social services
The Results point to the necessary conditions for implementation¹

Clinical

◆ A primary system of care with links with specialty care, in particular geriatric medicine and psychiatry;
◆ Change and reform primary medical care in tandem with development of integrated service networks for frail older persons
◆ Clinical responsibility throughout system of care
◆ Protocols for detection and management: essential tools in integrating medical and social care
◆ Target population in terms of need and intensity of intervention
◆ Role and function of case management
The Results point to the necessary conditions for implementation²

**Governance and management**

- Governance which respects the diverse components but which fosters decision making and accountability
- Performance measures which reflect system clinical and management responsibilities at a system level: health, quality, satisfaction, administration, utilization of resources, budget, etc
- Information and communication systems
The Results point to the necessary conditions for implementation³

Financing and allocation of resources

- Budget and resource allocation which supports intensification of the community intervention, flexibility in the utilisation of resources and allocation of resources based on performance:
  - Per capita
  - Targeted protected budget
Important influence in Clair Commission recommendations (Family Medicine Groups and Integrated Service networks for frail older persons) and Quebec gov’t policy orientation

*www.cessss.gouv.qc.ca*