Evaluation of morbidity profile among community-dwelling elderly in India; awareness and attitude towards assistive technology

Dr Alakananda Banerjee, New Delhi, India
MAX HEALTH CARE’S (MHC) NETWORK OF HOSPITALS, New Delhi

Healthcare facilities 8
Physicians 1,250
Nurses 1,400
Other support staff 1,500
Patient base Over 600,000
Patient transactions Over 150,000 pm
Beds 800
ICU beds 225
OTs 20
Cathlabs 3

2 SUPERSPECIALITY, 4 MULTISPECIALITY HOSPITALS & 2 SPECIALITY CLINICS IN NEW DELHI AND NCR OF DELHI
Population of Delhi...17 million
Introduction

• A study in Bangalore (Jai Prakash 1998) found that the fear of physical dependency, (including being sick, or disabled) rather than economic dependency was a major cause of worry for the elderly.

• The Indian aged population is currently the second largest in the world. The absolute number of the over 60 population in India will increase from 76 million in 2001 to 137 million by 2021.

• Although one cannot reverse the aging process, but can find effective ways to cope with it

• Few older citizens are discovering that assistive technology devices and services and home modifications provide new ways to improve quality of life.
Objective of study

• To review the literature of morbidity profile among community dwelling elderly in India

• To find out awareness and attitude towards usage of assistive devices in community dwelling elderly in urban and rural India

• To find out awareness and attitude towards assistive devices among doctors, nurses, students of industrial design and students of architecture.
Need of study

- To get practical insights into the problems faced by community dwelling elderly in rural and urban India.

- Information collected can act as a guideline for taking necessary steps to reform awareness and attitude of assistive technology amongst professional care providers of the elderly and the elderly in India.
Disabled elderly-
People above 60 years of age are considered as elderly. The disabled elderly are those individuals who require assistance with basic Activities of Daily Living

Assistive Technology (AT)
Is a technology (mobility devices such as walkers and wheelchairs, as well as hardware, software) used by individuals with disabilities in order to perform functions that might otherwise be difficult or impossible
Literature review
Ageing in India

- India is a unique country. It has at least 5000 years of history.

- In ancient India, life span of one hundred years was divided into four stages:
  1. life of a student,
  2. householder,
  3. forest dweller and
  4. ascetic.

- There was a gradual move from personal, social to spiritual preoccupations with age.

(AGEING IN INDIA prepared for WHO by Dr Indira Jai Prakash Professor of Psychology Bangalore University, Bangalore, India, 1999)
FILIAL PIETY. It was considered the duty of a son to respect and care for his parents.

Living with the ELDEST SON and his family is the most common living arrangement.

In modern India, RETIREMENT age is fixed at 60 in most Government jobs. For all practical purposes people above 60 are considered to be ‘senior citizens’.

In ACADEMIC RESEARCH, chronological age of 58 or 60 is considered as the beginning of old age.

AGEING IN INDIA prepared for WHO by Dr Indira Jai Prakash Professor of Psychology Bangalore University, Bangalore, India, 1999
India is geographically vast and culturally heterogeneous. Urban and rural environments present contrasts. Hence, generalizations should be made with caution.
In India out of 77 million elderlies, two-thirds live in rural areas and half of them in conditions of poverty.

The lack of a separate department to focus on the issues of the aged and their problems seems to be a mockery of human rights.

Social Security for Elderly in India  By Sonal Kulshreshtha, merinews.com August 10, 2009
India
Article 41 of the Directive Principles of State Policy in the Indian Constitution specifies that the State shall within the LIMITS OF ECONOMIC CAPACITY, provide for assistance to the elderly.

There is NO PLAN OF ACTION for human right to life for the elderly in our democratic set up.
There are many priorities that may push the interest of the older people into the background.
Population projection of elderly in India

- 2006: 20 million
- 2011: 57 million
- 2016: 70.6 million
- 2021: 143.7 million
- 2026: 173.1 million

Population 60+
Demographic transition/dependency ratio

- Migration of younger generation
- Prolonged life expectancy
- The OLD AGE DEPENDENCY ratio (number of old persons 60+ years) to the working age group (15-59 years) has increased from 9.8 per cent in 1981 to about 12.6 per cent in 2001
Emerging issues of elderly in India

- **TRADITIONAL BONDS**

- **SOCIAL SUPPORT**

- It is a commonly held belief that older people need to be "LOOKED AFTER", and their views are rarely taken into account in the formulation of health policy.
  (She too counts: Critical need for gender responsive healthcare for the elderly; Indu Kapoor, Director, CHETNA)
Emerging issues of elderly in India

- Geriatric wards exist merely in TWO hospitals in the whole of India.
  (She too counts: Critical need for gender responsive healthcare for the elderly
  (Indu Kapoor, Director, CHETNA))

- SKYROCKETING COSTS of private sector healthcare institutions resorts to avoidance of diagnostic and curative health opportunities.
  (The socio-demographic contact of the elderly in India.-Sugan Bhatia-President-Indian Association for continuing education)
The UN defines a country as ‘ageing’ where the proportion of people over 60 reaches 7 percent.

*By 2000 India will have exceeded that proportion (7.7%) and is expected to reach 12.6% in 2025*
Statistics India

- Total population: 1,151,751,000
- Gross national income per capita (PPP international $): 2,460
- Life expectancy at birth m/f (years): 62/64
- Healthy life expectancy at birth m/f (years, 2003): 53/54
- Probability of dying under five (per 1,000 live births): 76
- Probability of dying between 15 and 60 years m/f (per 1,000 population): 276/203
- Total expenditure on health per capita (Intl $, 2006): 109
- Total expenditure on health as % of GDP (2006): 4.9

Figures are for 2006 unless indicated. Source: World Health Statistics 2008
Changes in population structure will have several implications for health, economic security, family life and well-being of people.
Healthcare in India

Policies

Healthcare in India is the responsibility of constituent states and territories of India.

The National Health Policy was endorsed by the Parliament of India in 1983 and updated in 2002. (India national health policy – 2002)

The woman was disappointed to learn the more experienced she became, the older she got.
In 1991, India had about 22,400 PRIMARY HEALTH CENTERS, AND 27,400 CLINICS. These facilities are part of a tiered health care system that FUNNELS MORE DIFFICULT CASES INTO URBAN HOSPITALS while attempting to provide routine medical care to the vast majority in the countryside.

Private studies of India's total number of hospitals in the early 1990s were more conservative than official Indian data, estimating that IN 1992 THERE WERE 7,300 HOSPITALS.

Of this total, NEARLY 4,000 WERE owned and managed by central, state, or local governments.

ANOTHER 2,000, owned and managed by charitable trusts, received partial support from the government,

Remaining 1,300 HOSPITALS, many of which are relatively small facilities, owned and managed by the private sector.

The use of state-of-the-art medical equipment, often imported from Western countries, was primarily limited to URBAN CENTERS IN THE EARLY 1990S.

The Indian healthcare industry is seen to be growing at a rapid pace and is expected to become a US$280 BILLION INDUSTRY BY 2022.

APPROXIMATELY ONE MILLION PEOPLE, mostly women and children, die in India each year due to inadequate healthcare.

700 MILLION PEOPLE have no access to specialist care and 80% of specialists live in urban areas.

India faces A SHORTAGE OF TRAINED MEDICAL PERSONAL especially in rural areas.

Age & Sex wise distribution of Study subjects (n= 606) (elderly population of Rohtak town.)


<table>
<thead>
<tr>
<th>Socio-economic status</th>
<th>Joint pains</th>
<th>Cataract</th>
<th>Anaemia</th>
<th>Hypertension</th>
<th>Diabetes mellitus</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lower</td>
<td>154</td>
<td>108</td>
<td>158</td>
<td>67</td>
<td>27</td>
</tr>
<tr>
<td>Lower-middle</td>
<td>58</td>
<td>84</td>
<td>69</td>
<td>20</td>
<td>13</td>
</tr>
<tr>
<td>Middle</td>
<td>42</td>
<td>63</td>
<td>33</td>
<td>22</td>
<td>14</td>
</tr>
<tr>
<td>Upper-middle</td>
<td>18</td>
<td>14</td>
<td>9</td>
<td>17</td>
<td>11</td>
</tr>
<tr>
<td>Higher</td>
<td>7</td>
<td>4</td>
<td>2</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Total</td>
<td>279</td>
<td>273</td>
<td>261</td>
<td>133</td>
<td>67</td>
</tr>
</tbody>
</table>
Morbidity Pattern Among the Elderly Population in the Rural Area of Tamil Nadu, South India

Table 3. Morbidity observed in the study population (n=320)

<table>
<thead>
<tr>
<th>Morbidity condition</th>
<th>No. (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Joint pain/joint stiffness</td>
<td>139 (43.4)</td>
</tr>
<tr>
<td>2. Chewing problems/Edentulous mouth</td>
<td>135 (42.1)</td>
</tr>
<tr>
<td>3. Reduced visual acuity (cataract)</td>
<td>103 (32.1)</td>
</tr>
<tr>
<td>4. Generalized body pain</td>
<td>96 (30.0)</td>
</tr>
<tr>
<td>5. Hypertension</td>
<td>83 (25.9)</td>
</tr>
<tr>
<td>6. Reduced visual acuity (refractive error)</td>
<td>79 (24.6)</td>
</tr>
<tr>
<td>7. Impaired hearing</td>
<td>46 (14.3)</td>
</tr>
<tr>
<td>8. Gastrointestinal pain/Diarrhoea</td>
<td>36 (11.3)</td>
</tr>
<tr>
<td>9. Dermatological complaints/pruritus</td>
<td>37 (11.9)</td>
</tr>
<tr>
<td>10. Chronic cough</td>
<td>36 (11.3)</td>
</tr>
<tr>
<td>11. Known cardiac illness</td>
<td>27 (8.4)</td>
</tr>
<tr>
<td>12. Known Diabetes</td>
<td>26 (8.1)</td>
</tr>
<tr>
<td>13. Asthma</td>
<td>19 (5.9)</td>
</tr>
<tr>
<td>14. Urinary symptoms</td>
<td>18 (5.6)</td>
</tr>
<tr>
<td>15. Tuberculosis under treatment</td>
<td>4 (1.3)</td>
</tr>
<tr>
<td><strong>Total Morbidity</strong></td>
<td><strong>886</strong></td>
</tr>
<tr>
<td><strong>Average Morbidity prevalent</strong></td>
<td><strong>2.77</strong></td>
</tr>
</tbody>
</table>

(Anil Jacob PURTY, Joy BAZROY, Malini KAR, Kavita VASUDEVAN, Anita VELIATH, Purushottam PANDA
Department of Community Medicine, Pondicherry Institute of Medical Sciences, Kalapet, Pondicherry-605014, India, May 2005)
Common elderly care settings in India

Home and “community-based care" is a catch-all phrase that refers to a wide variety of non-institutional long-term care settings, ranging from various types of congregate living arrangements to recipients' own homes.

One category of home and community-based care, old age homes, includes assisted living facilities, day care, senior citizen clubs.
Concern

- Old age homes will remain a necessary option for elders with severe disabilities with insufficient informal support and inadequate living arrangements.

- Policymakers and providers will have to continue to struggle to integrate primary, acute, and long-term care services needed by elderly individuals with disabilities.

- This effort must include more experimentation with models that coordinate services without requiring full financial and clinical integration, between healthcare in private and public sector.
Concern

- India stands just a little over 0.7 hospital beds per 1000 population. (Indian Healthcare: The Growth Story)

- With urbanization, families are becoming nuclear, smaller and are not always capable of caring for older relatives.

- Yet, in India, older people are still cared for by their families. Living in old age homes is neither popular nor feasible.

- Allowing parents to live in old age homes draws criticism from the family network and society at large.
Assistive Technology will play an important role in the life of an elderly in India.
Assistive technology and home modifications in India

- Assistive devices and home modifications exist that promote greater independence and safety for older individuals in the areas of mobility, self-care, and home management are not available in Indian markets.

- There are only a few assistive-device manufacturers in the organized sector in India. Their total production capacity may meet only 5 to 7 per cent of the requirements of the disabled.

- No data on manufacturers in informal sector production centres is available, but some centres are probably fulfilling only 2-3 per cent of the requirements of people with disabilities.
Many older adults have difficulty with functional activities and DO NOT RECOGNIZE THAT HELP is available to them.

• Most of the assistive devices in the country are manufactured by indigenous manufacturers in the formal and informal sectors. A FEW WELL-OFF PEOPLE WITH DISABILITIES IMPORT DEVICES DIRECTLY FROM DEVELOPED COUNTRIES.
Assistive technologist engaged in research and manufacturing of rehabilitation goods in India

THE JAIPUR LIMB

With this efficient limb fitted, a person

- can walk like a normal person without a stick or support,
- Run
- ride a bicycle
- climb a tree

Many of the patients can, after the fitment, go back to work in the field, factories, shops and offices.
Five hospitals,

Three managed eye hospitals

A manufacturing center for ophthalmic products

An international research foundation and a resource and training center that is revolutionizing hundreds of eye care programs across the developing world.

OVER 2.3 MILLION OUT PATIENTS WERE TREATED AND OVER 270,444 SURGERIES WERE PERFORMED BETWEEN APRIL 2006 AND MARCH 2007
AUROLAB THE MANUFACTURING DIVISION OF ARAVIND EYE HOSPITAL,

Many international organizations actively participate in developing the various activities in Aurolab.

The products are primarily supplied to non-profit eye care programs at affordable prices. The products include:

- Intraocular Lens,
- Suture Needle,
- Pharmaceutical,
- Cataract kit,
- Instruments
ARTIFICIAL LIMBS MFG. CORPN. OF INDIA

(A Govt. Of India Undertaking)

Ministry of Social Justice & Empowerment

Manufacturers 355 types of aids and appliances for Orthopaedically, Hearing and Visually Handicapped.
Wheelchairs that are completely designed, manufactured and tested in India as per International Standards (ISO 7176 for powered wheelchairs).

95% of parts and components are either manufactured here or from reputed companies who follow international standards.

All the equipments are designed to last long in Indian conditions.
The UK government believes it is in all our interests to help poor people build a better life for themselves.

So in 1997 it created a separate government department - the Department for International Development (DFID) to meet the many challenges of tackling world poverty.

It is DFID’s job to make sure every pound of British aid works its hardest to help the world’s poor.

The Disability Knowledge and Research Program was funded by the UK Department for International Development and was managed by Health link Worldwide and the Overseas Dev.Grp.
Research collaborations in India by developed countries

**STANFORD INDIA BIODESIGN**

The goal of Stanford-India Bio-design is to train the next generation of medical technology innovators in India.

This highly competitive program is directed towards Indian citizens who have an interest in the invention and early-stage development of new medical technologies.

Funded by:

• Department of Biotechnology, Ministry of Science and Technology, Government of India,

• Stanford University

SIB Fellowship Program is centered in New Delhi, Administered as a collaboration between Stanford University, the Indian Institute of Technology Delhi, and the All India Institute of Medical Sciences (AIIMS) in partnership with the Indo-US Science & Technology Forum
Transfer of Ideas/Technology

In India, the number of people using inappropriate wheelchairs or none at all is enormous by comparison.

These facts prompted the Indian government to seek collaboration with US wheelchair designers to improve the quality of their wheelchairs.

The result has been a collaborative design project between HERL and Artificial Limb Manufacturing Company (ALIMCO, the largest wheelchair manufacturer in India) since 2000 with subjects of ISIC(spinal injury center).
The Indian railways would offer special facilities like MORE ACCESS RAMPS AND LOW HEIGHT WATER TAPS FOR DISABLED PASSENGERS.

All important and B category stations phase wise, all zones of the railways will complete this ambitious project by the end of 2010 in the larger interest of disabled people.

The railways would provide NON–SLIPPERY WALKWAY AND SPECIAL SIGNAGE for physically disabled, elderly and visually impaired passengers at Patna Junction (state of Bihar) too.

Railways will soon operate BATTERY–OPERATED CARS at major stations.
Low-floor buses are in tune with the international practices and designs and are considered to be less accident-prone, as the driver sits in a sufficiently advantageous position at a lower level giving him greater visibility.

It is also disabled-friendly with place for two wheelchairs.

Low-floor buses in New Delhi
Aiming at "creating equal opportunities in the electronic age", the plan has been chalked out to make simple things like withdrawing money from an ATM machine or watching the TV by a blind person or accessing a kiosk at the railway station by the physically handicapped possible.

The information technology ministry has approved a draft on National Policy on Electronic Accessibility prepared by an NGO and will submit it to the central government for approval. ATM machines to become DISABLE-FRIENDLY soon in New Delhi.
Problem at the TAJ MAHAL

The nearest you can get to the Taj Mahal if you are a wheelchair user – an alternative to explore possibility of being carried down physically...
### Aids for Physical Impairments

<table>
<thead>
<tr>
<th>Corporation</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artificial Limbs</td>
<td>Mobility aids &amp; Writing aids, Orthotics &amp; Prosthetics, Spinal braces</td>
</tr>
<tr>
<td>Manufacturing</td>
<td></td>
</tr>
<tr>
<td>Corporation of India,</td>
<td></td>
</tr>
<tr>
<td>Kanpur</td>
<td></td>
</tr>
<tr>
<td>Bhai Mahaveer</td>
<td>Jaipur foot/limbs, Calipers</td>
</tr>
<tr>
<td>Viklang Sahayata</td>
<td></td>
</tr>
<tr>
<td>Samiti</td>
<td></td>
</tr>
<tr>
<td>SAGE (Everest engineers)</td>
<td>Wheelchairs &amp; Walking aids, Commode chairs</td>
</tr>
<tr>
<td>Vir Engineers</td>
<td>Kinetic Honda 100 cc adapted motorcycles, Chetak 150 cc adapted motorcycles</td>
</tr>
</tbody>
</table>

### Aids for Hearing Impairments

<table>
<thead>
<tr>
<th>Corporation</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arphi Electronic Pvt. Ltd</td>
<td>High-power BTE hearing instruments</td>
</tr>
<tr>
<td>Elkon Private Limited:</td>
<td>Auditory training instrument</td>
</tr>
<tr>
<td>Sight &amp; Sound</td>
<td>Hearing aid cords, TV listening Cord, Ear tips, Ear moulds, Ear phones</td>
</tr>
</tbody>
</table>

### Aids for Visually Impairments

<table>
<thead>
<tr>
<th>Corporation</th>
<th>Products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sight &amp; Sound</td>
<td>Ptosis spectacle, Occluding contact lenses for therapy, Pin hole contact</td>
</tr>
<tr>
<td>Louis Braille</td>
<td>lenses</td>
</tr>
<tr>
<td>Memorial Research Center</td>
<td>Safety stylus with eraser, Notex (money handling machine), Inland/envelope</td>
</tr>
<tr>
<td></td>
<td>addressers</td>
</tr>
<tr>
<td>Ahuja Bhoomithi Sadhan</td>
<td>Geometry box, Sathee cane, Beeper (Homing device), Composite braille slate</td>
</tr>
</tbody>
</table>
STUDY DESIGN
Cross sectional survey

SETTINGS
Part A:
• Residential rural areas in Shimla, Himachal Pradesh.
• Residential areas of Delhi

Part B:
• Max hospital, Saket, New Delhi
• Indian Institute of Technology, New Delhi
• School of Planning and Architecture, New Delhi
SAMPLING METHOD
Convenience sampling

DURATION OF THE STUDY
February 2009 - July 2009

SAMPLE SIZE
• 40 subjects were recruited for Part A (20 elderly subjects from rural and 20 from urban areas)
• 80 subjects were recruited for Part B (20 Doctors, 20 Nurses, 20 Students of Industrial Design, 20 Students of Architecture)
INCLUSION CRITERIA
(Part A)
• Subjects Aged above 60 years. The study subjects were residents of rural areas of Shimla (Basantpur village), and urban areas of Delhi.
(Part B)
• Doctors, Nurses, Students of Industrial Design, Students of Architecture

TESTER
• Testers were two qualified occupational therapist, and two physiotherapists.

OUTCOME MEASURES
• Assistive technology awareness questionnaire
METHODOLOGY OF DATA COLLECTION

Part A
• House to house visits were made to recruit the eligible study subjects. The study objectives were explained to the eligible subjects and their informed verbal consent was sought. Subjects who agreed to participate in the study were administered an interview schedule and the information regarding activities of daily living, environmental barriers, health facilities, assistive technology awareness and attitude was sought.

Part B:
• Assistive technology awareness questionnaire was distributed to Doctors, Nurses, Students of Industrial Design & Students of Architecture and the information were collected.
DATA ANALYSIS

Was done using Microsoft excel 2007 version
There was lack of awareness about AT among the elderly as well as the care takers.

In spite of the need for modification, most of the elderly were not willing to change because of:
- Financial constraints
- Personal and cultural issues

All of them had mobile phones to communicate but was not customized as per their deficits and requirements.

Caregivers were supportive & caring in rural areas. They had good traditional bonding with the elderly.

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<table>
<thead>
<tr>
<th>RURAL</th>
<th>URBAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>There was lack of awareness about AT among the elderly as well as the care takers.</td>
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</tr>
<tr>
<td>In spite of the need for modification, most of the elderly were not willing to change because of: Financial constraints, Personal and cultural issues.</td>
<td>In spite of the need for modification, most of the elderly were not willing to change because of: Caregivers Issues.</td>
</tr>
<tr>
<td>All of them had mobile phones to communicate but was not customized as per their deficits and requirements.</td>
<td>All of them had mobile phones to communicate but was not customized as per their deficits and requirements.</td>
</tr>
<tr>
<td>Caregivers were supportive &amp; caring in rural areas. They had good traditional bonding with the elderly.</td>
<td>Caregivers were not so supportive &amp; caring. They were dependent on hired attendants.</td>
</tr>
</tbody>
</table>
The information collected from the rural & urban areas revealed the following information:
<table>
<thead>
<tr>
<th>RURAL</th>
<th>URBAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost all the elderly were having TV &amp; radio at their home. There was inadequate electricity supply.</td>
<td>The elderly in urban areas were having TV &amp; radio at their home. There was adequate electricity supply</td>
</tr>
<tr>
<td>Lack of adequate health facilities</td>
<td>Adequate health facilities &amp; access to secondary and tertiary care units are available in public and private sectors. Sky rocketing costs in Private sectors Poor insurance coverage</td>
</tr>
<tr>
<td>Absence of emergency services</td>
<td>Adequate Emergency Services Present</td>
</tr>
<tr>
<td>Poor transportation</td>
<td>Transportation and communication is good</td>
</tr>
<tr>
<td>House made of stones and mud. High thresholds</td>
<td>The elderly in urban areas were mostly residing in flats which used to cause difficulty in transition from ground to their residing floor. Houses not modified according to the needs of elderly</td>
</tr>
<tr>
<td>Roads are slippery</td>
<td></td>
</tr>
<tr>
<td>Inadequate drainage system</td>
<td></td>
</tr>
<tr>
<td>Indian toilets</td>
<td></td>
</tr>
</tbody>
</table>
Part B

• The average score of information about AT at present among all the four professionals was 2.51 which shows that they had little or some information about AT.

• Graph shows that the architects were more aware about AT followed by nurses and engineers. Doctors were least aware about AT.
• The average score of the AT changes in the last decade among all the four professionals was 2.94 which shows that all of them agreed that there has been changes in a positive direction.

• Graphs shows the nurses were more aware about the AT changes in the last decade followed by engineers architects. Doctors had the least information.

Information about AT compared to year 1999 among Doctors (DR), Nurses (N), Engineers (IIT), Architects (Arch)
Discussion
Most elderly people in India with long-term care needs believe their needs are being met.

It is important to remember, however, that most of the care is being provided "free" by family and friends;

Unlike the acute care system, in which physicians direct most care, nurses and local helps are the dominant professional providers of the long-term care.

The most important formal long-term care providers are allied health professional the certified nursing assistants, home health aides and, home care or personal care workers.
A set of steps is described for how to develop a management system through which the health promotion activities functions can be carried out effectively in primary, secondary and tertiary healthcare systems.
Awareness on AT seems to be triggered by, the professionals (e.g. Physicians, Occupational Therapists, Physiotherapists, Geriatric specialists),

•They take note of the sensory and cognitive deficits, frailty, ailments, etc, when elderly visit them for consultation

•Advocacy initiatives in regard to awareness concerning AT amongst specialists/doctors is important

•Matching an individual's needs and abilities with appropriate device requires a basic knowledge of physical needs assessment techniques and an adequate knowledge on the available technology..
There is a need to use existing channels of communication with rural communities.

**These channels include**

- Telemedicine and telecare
- Radio and television program directed at rural communities,
- The information, education and communication channels of primary health care, community development, rural development program government and NGOs could help disseminate basic information on rehabilitation and assistive devices.

Distribution, repair and maintenance of AT
Camps are usually organized by government agencies and NGOs.

Repair and maintenance

Devices like computerized braille embossers, text reading machines, and stair lifts are often difficult to repair even in cities and towns.

The reasons can be non-availability of spare parts, lack of local technical skills, or both.

More emphasis must be placed on the development of repair and maintenance services in rural areas.
• NHS Connecting for Health (NHS CFH) played an instrumental role in opening a dialogue between Continua and IHE.

• The recent signing of an agreement between the Continua Health Alliance (Continua) and Integrating the Healthcare Enterprise International (IHE) is an important step forward to improve the delivery of healthcare and enable and promote interoperability of healthcare devices.

• Both organizations recognize the need for and the benefit of connecting medical and patient care devices with the healthcare system, a synergy that supports the joint educational and marketing efforts between the organizations.
• In a country like India, where there is an overwhelming demand for quality wheeled mobility aids are limited or no supply, this problem is even greater.

• Unlike automobile and electronics technologies, transfer of AT from developed to undeveloped countries has not been accomplished effectively.
Future Targets
EVERY TECHNOLOGY/IDEA IS A CAUSE, THE EFFECT IS PROGRESS OF SCIENCE

Contexts and Content in Science and Technology, Michael A. De Miranda A. Mark Doggett Jane T. Evans
**Max Institute of Medical Excellence, New Delhi** provider of state of quality healthcare in India will sign a memorandum of understanding with the prime technology institute of India the **Indian Institute of Technology New Delhi**

The program would highlight medical needs of patients to Students of Industrial Design thru

- lecture series
- bring students to the hospital for practical insights into problems that a patient face in the hospital and community.

A web page designed and incorporated in website for the staff of the hospital namely physicians, nurses and allied health professionals will encourage to bring forward problems faced by them involving patient treatment process.

**NEEDS WOULD IDENTIFIED AND DATA COLLECTED FOR FUTURE PROJECTS OF THE SCHOOL OF INDUSTRIAL TRAINING.**
HYPOTHESIS: BY INTEGRATING ACUTE AND LONG TERM CARE THRU A GERONTOLOGICAL CARE MODEL WILL IMPROVE HEALTH AND AWARENESS OF AT OF A COMMUNITY BASED ELDERLY

• Community pilot studies are planned in three areas of Delhi and NCR. Each area would belong to different socio-economic background.

• Creating a dynamic process to ensure emergence of integrated bands of workers functioning within the "Health Team" approach.

• The main resource would be elderly as local supervisors (LS) in the age group of 55-70 years who would be trained to form a gerontological nuclei, within their area.
• The Local Supervisors will be educated with the skills they need.

• They then find disabled elderly in their local area and help them identify their felt needs.

• The LS act as local rehabilitation resource persons through this GERONTOLOGICAL CARE MODEL.

• The CBR team builds up local resources and establishes referral services to tertiary care as needed.
Conclusion
The first step towards achieving the above objective is to create awareness of ATs amongst physicians and surgeons of the tertiary to the primary healthcare level. The following would hasten the process.

- Creation of CBR for elderly

- Collaboration with developed countries by transfer of technology through research and development to developing countries

- Collaboration of healthcare providers in India with student of design and architecture.
In a study towards the development of an effective technology transfer model of wheelchairs to developing countries in 2006 done by the University of Pittsburg, said the following:

“And estimated 20 – 100 million wheelchairs are needed in developing countries.

Efforts to provide wheelchairs either through donations or by starting small-scale workshops have been made for decades, but estimates suggest that less than 1 million wheelchairs have been provided.

We undertook this study to better understand why these efforts have not met the need, and to investigate if other technology transfer models may be successful for wheelchair provision”
• There is need to document the extent of use of such technologies based on the extent of user awareness, market access, and institutional awareness in India.

• Education/awareness and collaboration through community-based rehabilitation is a key variable that determines who would be better able to express his/her demand.
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