

Australian Rehabilitation and Assistive Technology Association (ARATA)



ARATA's response to the Senate inquiry into the
delivery of outcomes under the National Disability Strategy
(2010-2020)

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1. EXECUTIVE SUMMARY

Assistive Technology (AT) is an umbrella term for any device or system that allows individuals to perform tasks they would otherwise be unable to do, or increases the ease and safety with which tasks can be performed (World Health Organisation, 2004). AT is a key enabler in the delivery of outcomes under Australia's National Disability Strategy (NDS), with particular focus on NDS outcome areas one (inclusive and accessible communities), four (personal and community support) and five (learning and skills).

This submission responds to the terms of reference of the *Senate Inquiry into Outcomes Delivered Under Australia's National Disability Strategy (2010-2020)* using content from existing policy documents, reports and practice guidelines developed by the Australian Rehabilitation and Assistive Technology Association (ARATA) with its members. The submission also refers to key elements of good assistive technology practice, and areas of current issue. Some of this submission content has been summarised or reproduced directly from these existing reports, with citation of the source documents provided.

Within an effective National Disability Strategy, key elements of good assistive technology practice include clear definitions for assistive technology; providing the essential steps of assistive technology provision; and getting the right people involved in assistive technology provision. Key issues relating to assistive technology that currently exist include a lack of wholistic assistive technology provision to end users; insufficient rigorous research evidence to support the effectiveness of most assistive technology provision services and systems to direct practice; and potential mismatch of attitude, skill and knowledge of stakeholders working in assistive technology provision to user needs.

This submission makes key recommendations for the Senate Committee, as follows:

1. Australia's new National Disability Insurance Scheme (NDIS) is beginning to address assistive technology requirements for Scheme participants; however, more work needs to be done to ensure assistive technology solutions are not limited by funding silos or under-provision of assistive technology to people with disability who require it.
2. A focus on policy and practice development that builds AT user empowerment and choice, including self-defined outcomes, AT peer support and an informed NDIS participant base is necessary.
3. In the early stages of Scheme launch, there have been some unintended risks to Australia's existing assistive technology expertise base. Specifically, the NDIS launch has seen loss of funding for some Independent Living Centres, as state-funded disability services are transitioned into or lost to individualised funding models within the NDIS. This is an area that needs attention to ensure availability of consumer-focused assistive technology information services.

4. Many people living with disability require home and building modifications beyond platinum level Liveable Design and the Building Code of Australia requires amendment to ensure that there are minimum regulated standards for accessible and adaptable design in new builds.
5. Provision of a comprehensive, well planned and joined up national system of public transport is necessary to build transport access for people with disability.
6. Further government focus on NBN roll out and effectiveness is needed in the second implementation phase of the NDS.
7. Awareness and national recognition of the rights of people with disability to access assistive technology, and of the economic and social benefits of assistive technology to individuals and society, is required.
8. Beyond NDIS participants, sufficient resourcing of, and equitable access to, assistive technology services for Australians with an assistive technology need are required.
9. Coordination between mainstream and specialised services is necessary to ensure assistive technology solutions are appropriate to each individual's situation, and involve the AT user in all activities and decisions.
10. Agreed outcome benchmarks, meeting human rights criteria and supporting the World Health Organisation definitions of human activity and participation, are required.
11. Further strategic investment in assistive technology research is needed to build the evidence base of effectiveness of assistive technology provision services and systems.
12. There is a need for skilling of the AT sector to enable the development of AT professionals and support staff, collect outcome data on current practice, utilise inclusive research methods and collaborate as a community of practice to add to the evidence base.
13. Assistive technology quality or credentialing policy and practice should be invested in to meet individual needs and deliver high-quality, sustainable outcomes for society.

ARATA would welcome the opportunity to present to the Senate Committee – please contact ARATA president, Dr Natasha Layton,

Natasha Layton
President, ARATA

Libby Callaway
Member, ARATA

2. WHAT IS ARATA & WHAT DOES ARATA DO?

The Australian Rehabilitation & Assistive Technology Association (ARATA) is a national not-for-profit membership association of assistive technology consumers and practitioners. ARATA is focused on enhancing the lives of people of all ages and abilities through the best use of assistive technology. The Association is a forum for knowledge sharing between the range of people who are involved with the use, prescription, customisation, supply and ongoing support or training in the use of assistive technology. ARATA represents skilled practitioners, consumers, and suppliers Australia wide and is linked to sister organisations worldwide through the International Alliance of Assistive Technology Professional Associations and the CREATE Asia Agreement (ARATA, 2012).

3. WHAT IS ASSISTIVE TECHNOLOGY (AT)?

Assistive Technology (AT) is an umbrella term for any device or system that allows individuals to perform tasks they would otherwise be unable to do, or increases the ease and safety with which tasks can be performed (World Health Organisation, 2004). Assistive technology can be anything from a simple device in the kitchen to a wheelchair or a computer application. Assistive technology is vital in enabling participation in society despite the presence of disability. Assistive technology not only minimizes the impact of impairments, but it enables people to:

- enhance their independence
- work and volunteer
- care for themselves and others
- engage in cultural, social, educational, recreational and spiritual lives alongside the rest of the community.

In addition to a specific device or system used (i.e. 'hard technology'), 'soft technologies' or assistive technology 'services' are frequently necessary, and may at times be overlooked, when planning assistive technology interventions. Soft technology refers to human factors essential to successful delivery and use of the 'hard technology' (the AT device). Soft technology includes assessment, collaborative planning, trial, training, assistive technology set up and customisation, repairs, maintenance and review. Assistive technology needs to be well matched to the user, the tasks they undertake, and the environments in which they engage in daily life. This is the role of AT practitioners. The specialist skills of AT practitioners are critical in maximizing investment of public and private AT funds.

For further details, see http://www.arata.org.au/download/arata_flyermay2012.pdf (ARATA, 2012).

4. HOW CAN ASSISTIVE TECHNOLOGY BENEFIT AUSTRALIANS?

Assistive technology can be an enabling factor in the delivery of outcomes under Australia's National Disability Strategy. In 2012, as part of the 'Making a Difference with AT' paper series, ARATA published a paper on the positive consumer outcomes and economic potential of AT solutions (Layton & Walker, 2012), the findings of which are summarized below.

Assistive technology supports are classified according to their function (The International Organisation for Standardization, 2016). Assistive technology is most effective at ensuring social inclusion and optimal function over time when provided in a tailored package (referred to as assistive technology solutions or AT solutions). Assistive technology solutions for Australians with disability have been limited by funding 'silos' in the past, and there is evidence that substantial numbers of people with disability have experienced AT under-provision. Australia's new National Disability Insurance Scheme (NDIS) is beginning to address this area for Scheme participants, but more work needs to be done for both that group as well as with other Australians who may not get access to the Scheme, but for whom assistive technology may be beneficial.

AT solutions are only fully effective when 'soft technologies' (prescription, assessment, adaptation/fitting, training, maintenance, repairs, reviews etc.) are provided along with the AT device. Poor or unsuitable AT solutions not only reduce effectiveness but can also generate negative health outcomes and injuries. Investment in optimal AT solutions is demonstrated to offset other costs from a health and community services sector perspective, and to achieve multiple outcomes for the AT user, their support network and the broader community. See Section 9 for details (Layton & Walker, 2012).

5. ASSISTIVE TECHNOLOGY & THE AUSTRALIAN DISABILITY POLICY CONTEXT

ARATA is concerned with assistive technology (AT) users across the lifespan and endorses the focus of the National Disability Strategy on all Australians with disability, given *'the number of people with disability is growing significantly at both ends of the lifecycle – young and old – including those with the highest needs'* (Department of Social Services, 2010, p. 19).

Specific to Australians aged under 65 years who experience significant and permanent disability, the introduction of Australia's \$22B National Disability Insurance Scheme (NDIS) offers opportunity for participants to plan for personalised assistive technology equipment, home and vehicle modifications, and AT 'soft technologies' and supports linked to participation goals (National Disability Insurance Scheme, 2016). In the context of Australia's National Disability Strategy, there is real potential for NDIS participants to enhance their community inclusion via individualised NDIS planning and access to funded assistive technology and other supports, which may not have been possible prior to Scheme launch.

The National Disability Insurance Agency (NDIA), the agency that administers the NDIS, aims to ‘build an empowering, sustainable and consistent approach to ensuring National Disability Insurance Scheme participants have choice in, and access to, individualized assistive technology solutions that enable and enhance their economic and community participation’ (National Disability Insurance Agency, 2015, p. 12). The Agency has developed an AT Strategy, which is flagged for ongoing revision but outlines an initial three strategic priorities for achieving this vision, proposing initiatives to meet each of these strategies.

The NDS second implementation plan includes a focus on proposed increased national effort to achieve NDIS transition to full Scheme (Department of Social Services, 2016). ARATA strongly endorses this ongoing effort to ensure the Scheme works effectively and efficiently for NDIS participants, particularly in relation to building assistive technology empowerment and choice, including self-defined outcomes, AT peer support and an informed participant base. However, in the early stages of Scheme launch, there have been some unintended risks to Australia’s existing assistive technology expertise base. Specifically, the NDIS launch has seen loss of government funding of Independent Living Centres, as state-funded disability services are transitioned into individualised funding models within the NDIS. This is an area that needs urgent attention to ensure ongoing availability of well established, consumer-focused assistive technology information services.

6. SENATE INQUIRY TERMS OF REFERENCE & FOCUS OF THIS SUBMISSION

With a specific focus on assistive technology, this submission will respond to the key terms of reference for the Senate Inquiry into Delivery of Outcomes under the National Disability Strategy (2010-2020) to Build Inclusive and Accessible Communities (Parliament of Australia, 2016).

These terms of reference include:

- the planning, design, management, and regulation of the built and natural environment, including commercial premises, housing, public spaces and amenities, transport services and infrastructure, and communication and information systems, including Australian electronic media and the emerging Internet of things;
- potential barriers to progress or innovation and how these might be addressed; and
- the impact of restricted access for people with disability on inclusion and participation in economic, cultural, social, civil and political life.

7. SENATE INQUIRY SUBMISSION RESPONSE FROM ARATA

In relation to the inquiry terms of reference, this response focuses on two key areas:

- Elements of assistive technology good practice
- Potential barriers to progress or innovation in assistive technology, and actions required to

address these.

Assistive technology good practice

The National Disability Strategy points to the benefits of universal design and access (Department of Social Services, 2010, p. 30). NDS policy directions 2-5 in outcome area 1 (inclusive and accessible communities) point specifically to the need to improve provision of accessible and well-designed built and natural environment, housing, transport and communication systems (pp. 31-32).

Improved accessibility of the built and natural environment

People with disability continue to experience barriers to access both private homes and public spaces. Long term leasing arrangements may allow modifications to rental properties that were not previously possible. However, many people living with disability require home and building modifications beyond platinum level Liveable Design and the Building Codes of Australia require amendment to ensure that there are minimum regulated standards for accessible and adaptable design in new builds.

An accessible transport system

Australia continues to lack investment in a comprehensive and accessible public transport system in both large metropolitan locations and regional areas. Reduction in the wheelchair accessible taxi industry, disrupted by Uber (where vehicles are not modified for wheelchair access), risks loss of accessible transport in the case that a person does not have access to public transport or does not have the necessary support to travel via an existing public transport system. Provision of a comprehensive, well planned and joined up national system of public transport is necessary to build access.

Accessible communication and information systems

Currently there is a burgeoning supply of Internet-enabled technologies that may be used to build participation, autonomy and environmental control. However, Internet, computer and smart device affordability, access and user literacy can be significant barriers for people with disability who may be living on low incomes or without access to 'soft technologies' to build skills. Following, the NBN has not yet offered the anticipated capability in Internet connectivity in Australia. In fact, people report some disadvantage when NBN supply replaces traditional supply. Further government focus on NBN roll out and effectiveness is needed in the second implementation phase of the NDS.

Specific accommodations for regional and remote access

To enable equitable access, the delivery of appropriate assistive technology supports must take into account the unique challenges faced by Australians living in regional and remote settings, including Aboriginal and Torres Strait Island people. Adequate resources are required to prevent factors such as distance and isolation i.e. access to transport, tele-health, local training and education; language and

culture i.e. development of resources in language, culturally appropriate service delivery, interpreter services.

ARATA's position specific to assistive technology is that inclusive design will best impact outcomes within Australia's NDS. Inclusive design also aligns with the United Nations Convention on the Rights of Persons with Disabilities (United Nations, 2006) and the key outcome domains in the World Health Organisation's International Classification of Function (World Health Organisation, 2001). This means designing for 100% of the population, such that there may be a need to couple different approaches to inclusive design concurrently. The use of facilitators such as assistive technology to ensure public spaces facilitate inclusion of people with disability equitable to other Australians (e.g. footpaths and curbs, transport services and access areas, parks and playgrounds, shops and services) avoids the risk, and human and financial cost, of non-social environments. This approach also allocates the responsibility of inclusivity to the community, rather than an individual. Cost savings can then be realised in the long term by avoiding the need for retrofit or individual customisation of built environments. However, to facilitate these outcomes, good assistive technology practice will be required.

The key elements of good practice, developed by ARATA and reviewed and ratified by over 200 delegates of the 2016 AATC Conference (Australian Assistive Technology Conference, 2016b), are summarised below:

1) Clear definitions for assistive technology

Clearly defining assistive products and related service steps, in relation to AT user-driven goals, enables all AT stakeholders to identify and provide all necessary elements of a successful assistive solution.

2) Providing the essential steps of assistive technology provision

Internationally recognised good practice steps for assistive technology provision include information and assessment, identifying and trialing assistive solutions, purchasing and customising the solution and ensuring ongoing and effective use, maintenance and review.

3) Getting the right people involved in assistive technology provision

The individual user of the assistive solution is the centre of assistive technology provision activities. Other participants in assistive technology provision include family and friends, formal and informal caregivers, health and disability professionals, engineers and technicians, product designers, manufacturers and suppliers.

For further details, see the AATC 2016 Statement of Good Practice in Assistive Technology Provision in Australia (Australian Assistive Technology Conference, 2016b) in Section 10.

Potential barriers to progress or innovation in assistive technology, and how these might be addressed

At the 2016 AATC Conference, ARATA also developed, reviewed and ratified an Assistive Technology Issues

Statement (Australian Assistive Technology Conference, 2016a) to accompany the Statement on Assistive Technology Good Practice. This statement identifies three key issues, and recommended actions, for assistive technology in Australia summarised below:

Issue 1: Wholistic assistive technology provision

Definitions: The term ‘assistive technology’ is used internationally, but not widely adopted in Australia where the term ‘aids and equipment’ is still in common use. Reaching a shared vision for defining, funding and deploying assistive technology is critical for its successful use. The NDIA’s AT strategy has offered some benefit in this area specific to NDIS participants, but more work is necessary given the broader application of assistive technology with other Australians.

Funding and access: There are significant gaps in the availability of assistive products and services for different populations (by location, age, and need) and inconsistent eligibility criteria for funding from public and non-government sources.

Service provision: There is fragmentation of assistive technology provision, with many programs delivering particular assistive products or services, but few that fully support all good practice steps of identification, sourcing and ongoing use of individualised assistive solutions. State-based Independent Living Centres (ILCs) have traditionally provided a conduit to, at a minimum, beginning identification and sourcing of assistive technology – as noted above the disability funding reforms underway have put risk to the information resource offered by ILCs.

Actions recommended

- Awareness and recognition of the rights of people with disability to access assistive technology, and of its economic and social benefits to individuals and society.
- Sufficient resourcing of and equitable access to assistive technology services that provide information, advice and support in finding and using assistive solutions, and to quality assistive products.
- Coordination between mainstream and specialised services to ensure that assistive solutions are appropriate to each individual’s situation, and involve the AT user in all activities and decisions
- Agreed outcome benchmarks, meeting human rights criteria and supporting the World Health Organisation definitions of human activity and participation.
- Examination of sustainability of state-based information sources like ILCs, given the changing disability funding environment.

Issue 2: Identifying the full costs and benefits of assistive technology

The use of technologies to assist with activities and participation is pervasive and it can be difficult to isolate the impact of assistive technologies in order to fully realise their effectiveness. The presence of environmental barriers or facilitators also plays a critical role in the experience of disability and the need for assistive technology or related environmental adaptations. Assistive Technology has demonstrated

effectiveness from both a health outcome, and cost, perspective. A range of studies provide methods to evaluate the economic impact on an individual basis. There is however insufficient rigorous research evidence to support the effectiveness of most assistive technology provision services and systems.

Actions recommended

- *Research:* Further strategic investment in assistive technology research is needed to build the evidence base of effectiveness of assistive technology provision services and systems.
- *Practice-based evidence:* There is a need for skilling of the AT sector to collect outcome data on current practice, utilise inclusive research methods and collaborate as a community of practice to add to the evidence base.

Issue 3: Matching attitude, skill and knowledge to user need in assistive technology provision

The individual user of the assistive solution must be the centre of assistive technology provision activities.

AT users include people of all ages with any sort of impairment (e.g. sensory, physical, and cognitive), health or age-related condition. Other participants in assistive technology provision include family and friends, formal and informal caregivers, health and disability professionals, engineers and technicians, product designers, manufacturers and suppliers. Appropriate attitudes, that is, the ability to be person-focused, goal oriented and to work co-productively are essential attributes for all stakeholders working in assistive technology provision. Skills and knowledge regarding assistive technology provision is drawn from education (including professional training), experiential knowledge and evidence-based practice.

Competent AT practitioners will identify their personal scope of practice and will engage in communities of practice to support their ongoing learning. Overlapping knowledge domains may exist. Different skillsets are indicated in different situations. This will depend on variables such as the nature of the AT user, their participation goals and their environments, as well as the complexity of the assistive technology and related supports. Based upon these factors, building an individual assistive technology solution may require:

1. Capability-building supports for the AT user and their circle of support;
2. Skilled peer supporters; generalist AT practitioners with relevant fields of knowledge;
3. Specialised AT practitioners or a combination of AT practitioners in the form of a team.

Wholistic and consumer-centered assistive technology provision, provided by appropriately skilled practitioners, is a cost effective strategy to achieve life outcome.

Actions recommended

- Education to support the development of AT professionals and support staff
- Quality or credentialing policy and practice that is most likely to meet individual needs and deliver high-quality, sustainable outcomes for society

For details, see section 11 (Australian Assistive Technology Conference, 2016a).

8. CONCLUSION

This Senate Inquiry aims to examine the delivery of outcomes under Australia's 10-year National Disability Strategy. Specific to assistive technology, key primary outcome dimensions valued by people who are users of assistive technology, and resulting from tailored assistive technology provision, include increased participation (objective and subjective), satisfaction, quality of life, well-being and inclusion. Secondary outcomes include cost effectiveness (including minimising social costs and cost offsets), decreased support costs, and lowered hospital admission and readmission rates (ARATA, 2016, p. 1).

Without inclusive accessibility of the built and natural environment, transport, communication and information systems (including electronic media and the Internet), people with disability will continue to experience participation restrictions compared to other Australians. Following, the impact of the investment made using NDIS funding, and progress towards outcomes under Australia's 10-year National Disability Strategy, will not be fully realised due to these ongoing barriers to inclusion. With three years left to achieve full implementation of Australia's National Disability Strategy, more work is to be done.

ARATA agrees with the NDS position that 'the responsibility for changing attitudes and responses to disability belongs to everyone' (Department of Social Services, 2010, p. 18). The Association looks forward to continued work with its members, other people living with disability and their families, government, and industry stakeholders to progress this important work.

9. THE ECONOMIC POTENTIAL OF ASSISTIVE TECHNOLOGY SOLUTIONS – AN INTRODUCTION (LAYTON & WALKER, 2012)

01 June 2012

The economic potential of Assistive Technology solutions – *an introduction*

By Natasha Layton & Lloyd Walker

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A photograph showing two men outdoors. One man, wearing a white hoodie with 'FILA' on it, is leaning over and pointing at a blue, rectangular device mounted on a wheelchair. The other man, wearing a dark jacket, is seated in the wheelchair and looking at the device. The background shows a paved area and some greenery under a clear sky.

The logo for the Australian Research Alliance for Assistive Technology (ARATA). It features a stylized human figure in blue and orange, with arms raised in a circular motion, set against a white circular background.

A paper in the ARATA
Making a difference with AT series

Key messages

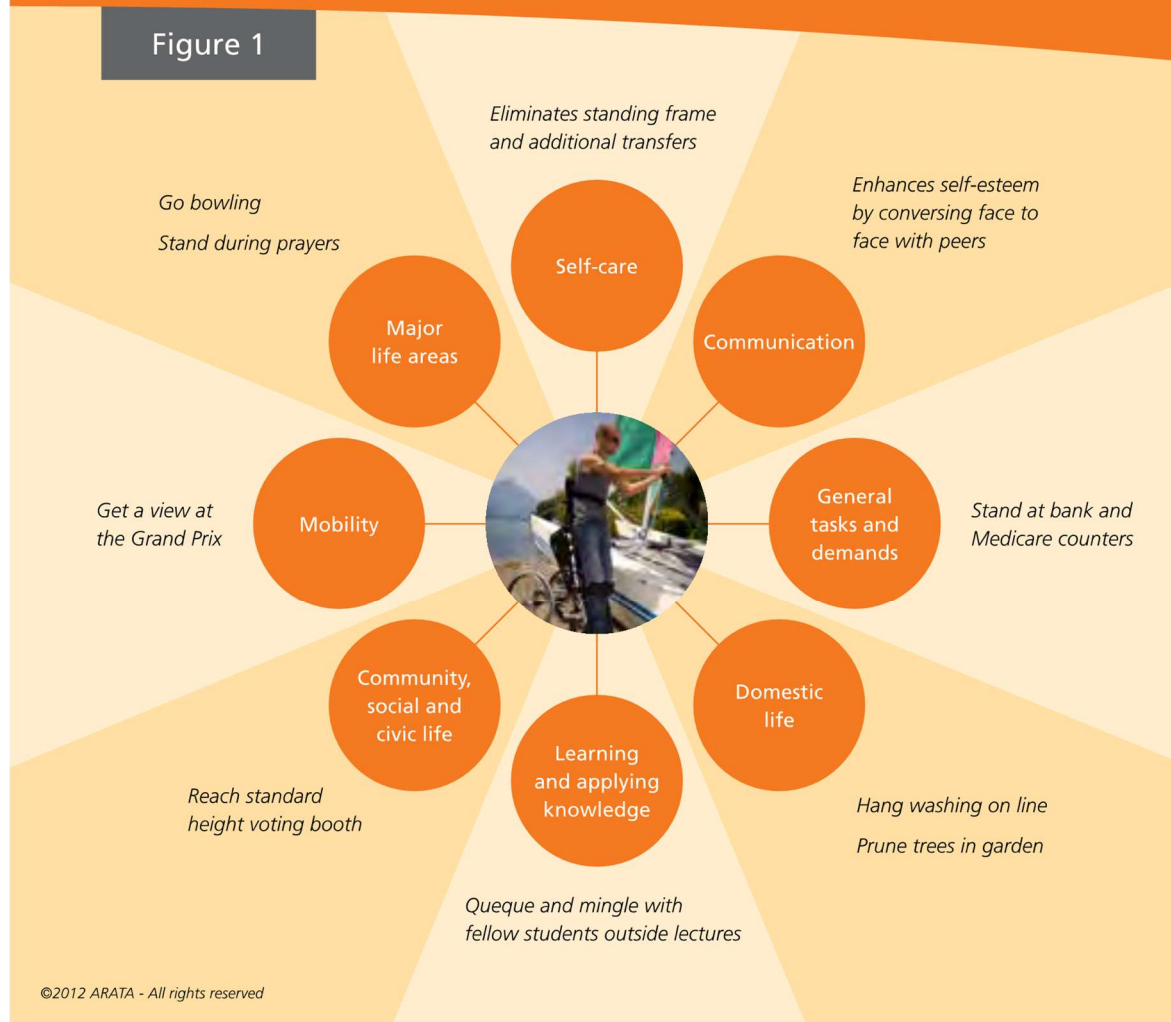
1. Disability Supports (ref Box 2 in Productivity Commission's Disability Care & Support Report, 2011) are most effective at ensuring social inclusion and optimal function over time when provided in a tailored package (here called an AT solution). They have been underprovided based on funding 'silos' in the past, and there is evidence that substantial numbers of PWD have experienced under-provision to date.
2. AT solutions are only fully effective when soft technologies (prescription, assessment, adaptation/fitting, training, maintenance, repairs, reviews etc) are provided along with the hard technology (AT device). Poor solutions not only reduce effectiveness but can also generate negative health outcomes and injuries.
3. Investment in optimal AT solutions is demonstrated to offset other costs from a health and community services sector perspective, and to achieve multiple outcomes.
4. Figure 1 below demonstrates potential discounting across WHO ICF defined activity and participation domains. The AT device used (stand-up wheelchair) was selected as it is not currently on any State Equipment Funder lists due to its cost, yet has great potential for outcomes.
5. It is possible to identify actual costs (purchase of AT devices; home and vehicle modifications; paid support; downstream costs of unpaid support) and relate these to person-centred outcomes. The data below will illustrate this point, and is drawn from a Victorian sample of consumers, reported in Layton, N., Wilson, E., Colgan, S., Moodie, M. & Carter, R. (2010) The Equipping Inclusion Studies: Assistive Technology Use and Outcomes in Victoria. Melbourne, Deakin University.

"An assistive technology solution is defined as an individually tailored combination of hard (actual devices) and soft (assessment, trial and other human factors) assistive technologies, environmental interventions and paid and/or unpaid care" A.T.Collaboration (2009) www.at.org.au



The impact of AT across all of life

Figure 1



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Figure 1 illustrates the impact to a user of a stand-up wheelchair across the WHO activity and participation domains.

- Cost approx \$17,000 (for a manual base) or \$28,000 (for a power base) which can be discounted across 8 life areas.
- **Specific cost-offsets:** eliminate need for kitchen modifications and purchase of standing frame; less personal support required (transfer).
- **Specific downstream costs avoided:** lower downstream risks for shoulder integrity due to decreased transfers.

Eight archetypal cases

These case studies were selected to illustrate the match of body function and structure variations to the WHO ICF domains. Eight research participants were selected on the basis of maximum variation, to explore the impacts and outcomes of a range of AT solutions. These cases included both genders, metro and rural dwellers, students, workers, volunteers, parents and retired individuals, ranging in age from 35 to 72 years.

Table 1 below describes the lives of these adult Australians with the AT solutions they have currently in place (note that similar work should also be undertaken for children and young adults). This analysis has costed their optimal AT solutions as defined by an expert panel of allied health AT practitioners. In the study an optimal solution was defined as achieving the 'best or most favourable' solution for the individual (ie no better option in terms of technology is available).

It should be noted that both study participants and the AT panel struggled to consider the full breadth of ICF domains, in particular the cultural, social and civic (CSC), and even the major life areas (MLA). Such areas have traditionally not been funded (CSC) or funded under very strict conditions (MLA).



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4

Table 1

Introducing 8 representative cases across the WHO ICF body function and structures

Demographics
and income

Severity of
disability

CASE 1

Ingrid is a busy volunteer with restricted hand function, severe involuntary movements, dysarthric speech and shoulder girdle degeneration. She uses a power wheelchair to travel to accessible areas within her regional community, but requires assistance to transfer and for personal care, provided by husband and paid supports. Ingrid lives with cerebral palsy. Ingrid requires 19 elements of AT solutions for optimal function and participation.

Body function and structures affected: voice & speech; neuromuscular; gastrointestinal

aged 45-64
married
rural
volunteer
(DSP)

severe

CASE 2

Ricky is a university educated young woman with multiple incapacitating chronic illnesses, which leaves her bedridden and supine, or at best elevated to no more than 30%. Ricky is rarely able to leave the home other than for medical appointments, in a power-recline wheelchair to manage her postural issues. Paid support is used for personal care and domestic tasks. She uses the computer for instrumental tasks such as banking, where possible. Her primary means of engagement with the world is via the internet, through the use of an extensive computer system, and with which she runs a small web business. Ricky needs 46 elements of AT solutions for optimal function and participation.

Body function and structures affected: mental functions; neuromuscular; metabolic; immunological

aged 25-44
single
inner city dweller
(DSP; ISP)

severe

CASE 3

Margaret has limited ability to change body position, secondary to restricted limb movement and strength wears a full orthotic jacket and boot to support her posture in her wheelchair, and uses a stick to reach and push household items as she cannot lift her arms. She travels widely on public transport, where environments are accessible. She is unable to transfer to the toilet without a disability support worker to assist with hoist transfers, therefore engages in careful management of her fluid intake in order to use the toilet at 7 am and 7pm during carer hours. Margaret lives with polio, post polio syndrome and the effects of ageing. Margaret needs 49 elements of AT solutions for optimal function and participation.

Body function and structures affected: voice & speech; neuromuscular; cardiovascular, respiratory, genitourinary; skin

aged 65-74
retired professional
PhD student
carer for elderly father
(DSP; ISP)

severe/profound

CASE 4

Lynne has multiple joint contractures, digit amputations and generalised weakness. She is a highly dedicated volunteer and parent. From her power wheelchair base, she uses accessible public transport, and lobbies to alter inaccessible venues and destinations. She has increasing difficulty unlocking and opening doors and reaching and using household appliances, and now cannot transfer into the family vehicle or caravan. Travel for leisure has been a key part of managing her husbands depression, and maintaining a lifetime hobby. Lynne has a diagnosis of arthrogryposis, and lives with incontinence. Lynne needs 22 elements of AT solutions for optimal function and participation.

Body function and structures affected: neuromuscular; sensory functions and pain; genitourinary; skin

aged 45-64
married
rural
volunteer
parent
(DSP)

moderate

NOTES: DSP – Disability Support Pension; ISP – Individualised Support Package, a form of direct payment used in Victoria

Table 1

Introducing 8 representative cases across the WHO ICF body function and structures

Demographics
and income

Severity of
disability

CASE 5

Peter lives with the late effects of polio. He has generalized fatigue and weakness of the muscles of the arms and legs, as well as a past history of back and shoulder injuries and depression. Peter can ambulate with a stick and callipers, but environmental barriers such as uneven paving or stairs test his balance and endurance. He has respiratory difficulties, suffering from severely sleep disordered breathing at night. Peter is a highly dedicated volunteer, and parent, who accompanies his daughter to school daily with his power scooter. Peter requires 18 elements of AT solutions for optimal function and participation.

Body function and structures affected: voice and speech; respiratory and cardiovascular; mental functions; neuromuscular

aged 45-64
retired professional
volunteer
parent
(superannuant)

mild

CASE 6

Jenny lives with multiple sclerosis and the effects of ageing. She has severe muscular weakness, severe tremor in their upper limbs and a lack of sensation in her hands. Jenny is unable to correct her posture if she falls sideways or forwards, unable to eat or drink without some degree of assistance and can only manage physical tasks that require limited gross motor skills. Paid carers leave drinks with straws carefully positioned on the bench, and flexible support in the form of 30 min or 15 min visits enable Jenny to eat lunch. Jenny uses a power wheelchair with adapted controls to move around her unit and the local community where pavements allow as many areas are unpaved. She greatly enjoys her grandchild and contact with friends and neighbours. Jenny needs 42 elements of AT solutions for optimal function and participation.

Body function and structures affected: mental functions; voice and speech; sensory functions; respiratory; genitourinary; neuromuscular; skin and related structures

aged 65-74
outer suburban dweller
retired grandmother
(aged pension; ISP)

severe

CASE 7

Yanni has L1 paraplegia. He returned home less than six weeks prior to interview, following rehabilitation, with partial home modifications, a manual wheelchair on loan, and vehicle hand controls. Yanni is a man in his 50's who lives rurally in a split level home on a steep block. He works from home, and access to his office/printery is via a flight of stairs. Yanni requires 22 elements of AT solutions for optimal function and participation.

Body function and structures affected: structures of the nervous system; cardiovascular; genitourinary

aged 45-64
rural dweller
full-time worker
parent

moderate

CASE 8

Grace is a person who is both deaf and blind. Her interaction with the world is primarily tactile, and she is unable to access cultural and leisure materials/activities (eg music, television, radio). She lives with her cat, and studies at TAFE. Her home is modified with tactile indicators and environmental controls. Grace uses paid support workers for essential tasks such as shopping and answering snail mail, but where possible uses paid support for preferred tasks such as swimming and trips to visit her family. Grace's outcomes would significantly improve with provision of either additional support hours, or additional AT devices currently unfunded (tactile Braille-enabled mobile phone). This paper costed the latter scenario. Figure 2 below identifies the impact of this AT solution.

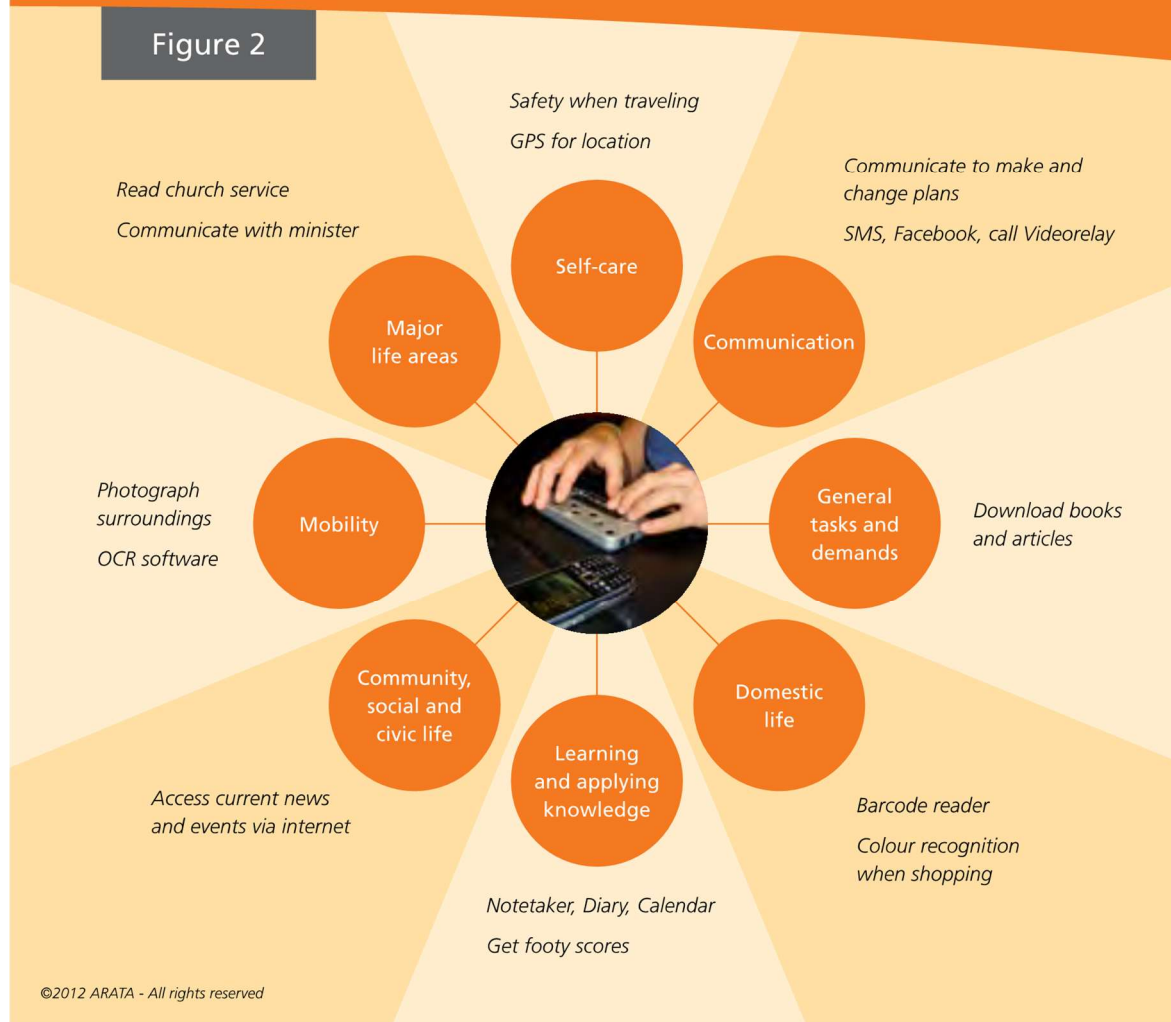
Body function & structures affected: sensory functions

aged 45-64
single
outer suburban centre
TAFE graduate
(DSP)

severe/profound

The impact of optimal AT

Figure 2



An example of the optimal outcome that can be achieved through appropriate AT is illustrated by an aspect of the AT specified for Grace (Case 8) who is both deaf and blind. This specialist AT can positively influence most of the ICF activity and participation domains as shown in Figure 2.

- Refreshable Braille device and mobile phone approx \$2,500 for Connie device and \$600 for Nokia phone.
- **Specific cost offsets:** increased capacity to make informed purchases due to increased choice and control as a consumer; increased options as a community-dweller, due to capacity to travel safely and independently.
- **Downstream cost savings:** support worker requirement minimised, autonomy and control maximised, with associated mental health benefits; support worker time freed for unmet need, eg swimming for fitness.

The cost

Detailed costing of nearly all the aspects of delivering optimal assistive technology has been undertaken for this paper. Table 2 below provides a summary of these costs for each case, described against the primary ICF domain targeted by the various AT solutions recommended.

To assist in comparison, Table 2 includes the cost of the identified paid attendant care costs (which would inevitably be higher under suboptimal AT provision), and also indicates the soft technology cost as a proportion of the AT capital cost. It should be clear that the soft technology cost is at an equivalent level to professional advice and assistance required for most capital investments.



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The cost

Table 2		The annual cost (for capital and soft technology) to provide Optimal AT for each study participant to meet their needs														
ICF domains	CASE 1		CASE 2		CASE 3		CASE 4		CASE 5		CASE 6		CASE 7		CASE 8	
	Capital	Soft	Capital	Soft	Capital	Soft	Capital	Soft	Capital	Soft	Capital	Soft	Capital	Soft	Capital	Soft
Learning and applying knowledge	\$0	\$0	\$361	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
General tasks and demands	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$50	\$0
Communication	\$397	\$79	\$1,499	\$480	\$28	\$162	\$0	\$0	\$0	\$0	\$71	\$0	\$0	\$0	\$6,557	\$421
Mobility	\$2,083	\$143	\$3,180	\$137	\$2,046	\$51	\$14,037	\$244	\$1,455	\$128	\$2,829	\$91	\$6,438	\$217	\$158	\$1,398
Self-care	\$6,407	\$192	\$3,131	\$151	\$7,698	\$278	\$3,563	\$49	\$2,984	\$70	\$3,795	\$105	\$3,632	\$42	\$0	\$0
Domestic life	\$16	\$16	\$3,521	\$156	\$1,985	\$95	\$923	\$57	\$74	\$0	\$6,211	\$120	\$0	\$0	\$329	\$0
Major life areas	\$0	\$0	\$2,905	\$303	\$1,227	\$0	\$0	\$0	\$355	\$16	\$521	\$0	\$0	\$0	\$0	\$0
Community, social and civic life	\$0	\$0	\$37	\$0	\$18	\$0	\$6,772	\$42	\$0	\$0	\$126	\$0	\$987	\$87	\$0	\$0
TOTAL AT cost per year	\$8,903	\$430	\$14,633	\$1,267	\$13,001	\$585	\$25,295	\$392	\$4,868	\$214	\$13,554	\$317	\$11,056	\$346	\$7,093	\$1,820
Soft technology costs as % of capital cost		4.8%		10.0%		4.5%		1.6%		4.4%		2.3%		3.1%		25.7%
Attendant care (crossing domains)	\$26,126		\$29,392		\$27,513		\$14,423		\$0		\$19,634		\$0		\$60,060	

NOTE: See Appendix 2 for more detailed breakdowns of these figures

The initial costing tables were developed by Deakin University (Stephen Colgan, Associate Prof Marj Moodie and Prof Rob Carter), as part of the Equipping Inclusion Studies commissioned by the Aids and Equipment Action Alliance (AEAA). The economic tables in this document have extra data added and different breakdowns.

Critical extensions needed to this work

While the eight cases represent adults who illustrate the scope of the ICF domains they are certainly not comprehensive. This work needs to be extended to consider in a similar fashion:

1. Children and their special needs for growth and transition points (eg into school and between school levels and then to study/work).
2. Those users who have rapidly degenerating conditions or health.
3. People whose prime disability is an intellectual or cognitive disability.

Factors such as AT residual value (and the scope/value of AT reuse/recycling schemes) and differing types of AT (eg learning or general tasks domains) are likely to be more prominent for some of these cases.



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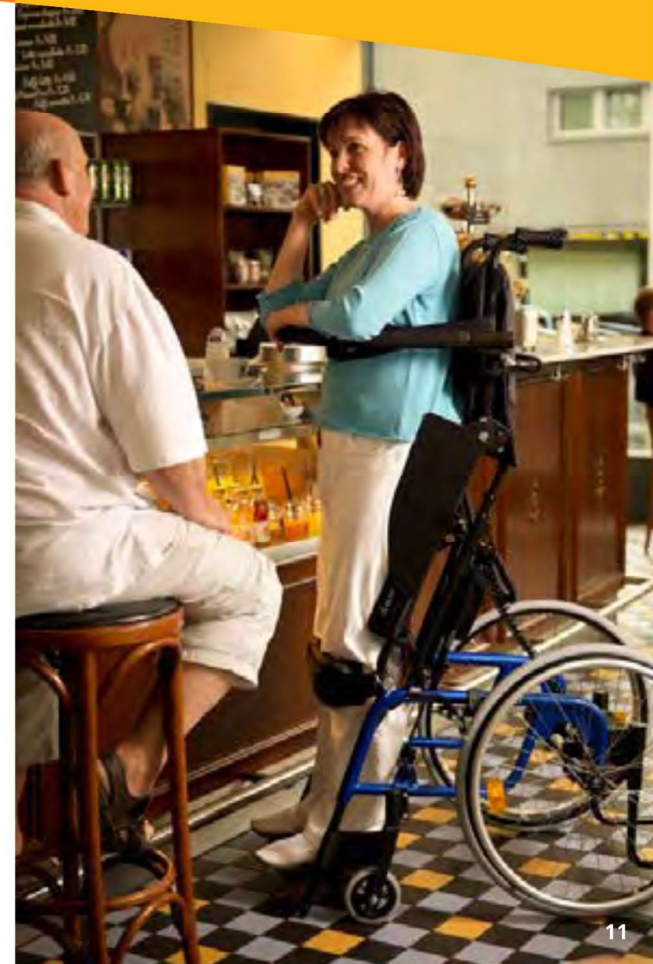


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Précis of evidence and conclusions

Analysis of evidence from these cases demonstrates:

1. Significant outcomes are possible in the areas of participation and satisfaction;
2. Difficulty (ie decrease in difficulty) is not a valid outcome area as consumers articulated a wish to achieve more with the same level of effort/ difficulty;
3. Timely soft technology application is critical to the achievement of outcomes;
4. Funding must cover the cost of soft technology, maintenance, and running costs, as well as appropriate depreciation of the devices themselves to allow for timely replacement. The critical costs for both soft technology and maintenance are a relatively minor component of the AT budget but have been overlooked in previous formulae and service provision. Cost effective AT provision requires all these costs be incorporated into NDIS;
5. In general, people with disabilities and professionals within the sector do not currently consider requirements for the community, social and civic domain (which includes recreation and spiritual activities) of the ICF since past and current schemes have not supported this key element of life at all;
6. Many of the soft technology costs stated are conservative since they represent the cost for an initial set up and training. Where timely and ongoing assistive technology provision is occurring, these initial costs can be discounted over much longer periods than just the service life of the initial AT device;
7. Much AT operates across many ICF domains. Assessment of success should thus be measured by participation in the higher level domains.



Appendix 1: Mapping WHO ICF body functions and structures to case participants

	WHO ICF body functions and structures	Representation across case participants
Domain 1	Mental functions	Cognitive issues
	Structures of the nervous system, eg spinal cord	Memory issues
Domain 2	Sensory functions and pain	Visual acuity deficits
	The eye, ear and related structures	Blindness and deafness
Domain 3	Voice and speech functions	Dysarthric speech
	Structures involved in voice and speech	Oral motor weakness
Domain 4	Functions of the cardiovascular, haematological, immunological and respiratory systems	Respiratory issues (physiological)
	Structures of the cardiovascular, immunological and respiratory systems	Respiratory issues (limited lung capacity)
Domain 5	Functions of the digestive, metabolic and endocrine systems	Gastrointestinal issues related to posture
	Structures related to the digestive, metabolic and endocrine systems	swallowing issues
Domain 6	Genitourinary and reproductive functions eg menstruation functions	Continence issues
Domain 7	Neuromusculoskeletal and movement-related functions	Athetosis
	Structures related to movement	Spinal lesion
		Neuromuscular junction disorder
Domain 8	Functions of the skin and related structures	Pressure care issues
	Skin and related structures	Parasthesia and impaired temperature regulation
		Amputation

Appendix 2: Annual costings across general sub-areas of the ICF domains

AT purpose descriptions	ICF domain	CASE 1		CASE 2		CASE 3		CASE 4		CASE 5		CASE 6		CASE 7		CASE 8	
		Capital	Soft	Capital	Soft	Capital	Soft	Capital	Soft	Capital	Soft	Capital	Soft	Capital	Soft	Capital	Soft
Learning	L	\$0	\$0	\$361	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Communication	C	\$397	\$79	\$1,499	\$480	\$28	\$162	\$0	\$0	\$0	\$0	\$71	\$0	\$0	\$0	\$6,557	\$421
Mobility	M	\$2,083	\$143	\$2,966	\$98	\$2,046	\$51	\$2,715	\$180	\$1,455	\$128	\$2,829	\$91	\$4,939	\$145	\$158	\$1,398
Transport	M	\$0	\$0	\$214	\$39	\$0	\$0	\$11,322	\$64	\$0	\$0	\$0	\$0	\$1,499	\$72	\$0	\$0
Food	SC	\$1,258	\$30	\$74	\$0	\$1,891	\$22	\$376	\$0	\$26	\$0	\$11	\$0	\$593	\$0	\$0	\$0
Hygiene	SC	\$5,149	\$162	\$333	\$30	\$4,044	\$96	\$2,602	\$31	\$1,351	\$21	\$2,527	\$61	\$2,998	\$27	\$0	\$0
Dressing	SC	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Health Tech	SC	\$0	\$0	\$42	\$0	\$1,246	\$127	\$0	\$0	\$1,607	\$49	\$0	\$0	\$0	\$0	\$0	\$0
Sleeping	SC	\$0	\$0	\$2,682	\$121	\$517	\$33	\$585	\$18	\$0	\$0	\$1,258	\$43	\$40	\$16	\$0	\$0
Household tasks	D	\$16	\$16	\$3,521	\$156	\$1,985	\$95	\$923	\$57	\$74	\$0	\$6,211	\$120	\$0	\$0	\$329	\$0
Processing / task management	GT	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$50	\$0
Education	MLA	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$16	\$0	\$0	\$0	\$0	\$0
Work	MLA	\$0	\$0	\$2,905	\$303	\$1,227	\$0	\$0	\$0	\$355	\$16	\$506	\$0	\$0	\$0	\$0	\$0
Community activity	CSC	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Recreation	CSC	\$0	\$0	\$37	\$0	\$18	\$0	\$6,772	\$42	\$0	\$0	\$126	\$0	\$987	\$87	\$0	\$0
Spiritual	CSC	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0

There is significant background data to this table:

- Each assistive technology (AT) recommended was individually costed; this table represents a summary.
- Although many items of AT impact across multiple categories above, each was allocated to the primary category that it affected.
- All lump sum costs (capital, soft technology initial cost, etc.) are depreciated against the service life of the AT (3% discount rate).
- Capital costs include: purchase cost, installation cost (both discounted over the service life), plus an annual maintenance cost.
- Soft technology costs are split into three categories: assessment and prescription (which would include fitting/customisation), training, and ongoing review. Hourly rate was set at \$95/hr.
- Attendant care cost was based on the rates from an average cost from Federal Carer Award. In 2010 this was \$17.89.
- The time allocated for professional involvement (soft technology) and care support, and the recommended assistive technology solution was specified by a specialist group of allied health practitioners. The purpose was to provide an optimal solution to achieve the 'best or most favourable' solution for the individual (ie no better option in terms of technology is available).

10. AATC 2016 STATEMENT ON GOOD AT PRACTICE

AATC 2016 Statement of Good Practice in Assistive Technology Provision in Australia

Advances in technology are transforming the lives of people of all ages around the globe, enabling greater participation in a broad range of activities. Enhancing inclusion by enabling participation benefits everyone in society, and this is increasingly important in Australia, where an ageing population means an increasing number of people living with chronic conditions and disability. Assistive technologies (AT) are critical to the health and wellbeing of one in ten Australians, and national expenditure on AT exceeds \$4.4 billion¹ Access to quality assistive technology will enhance their political, social and

economic participation and inclusion in Australian society.

Principles of assistive technology provision: ²

1. The process is person centred, not product or service centred,
2. The outcome is enablement of participation in desired activities,
3. An evidence-informed process is used in assistive technology provision,
4. Assistive technology provision is conducted in an ethical manner, and
5. Assistive technology services are provided in a sustainable manner.

Developed by ARATA and reviewed and ratified by over 200 delegates of the 2016 AATC Conference, this statement summarises the current state of the science in assistive technology research and practice for the Australian context into 3 directives for good practice:

1. Clear definitions for assistive technology

Clearly defining assistive products and related service steps, in relation to AT user-driven goals, enables all AT stakeholders to identify and provide all necessary elements of a successful assistive solution.

Assistive technology comprises products and services used to provide assistive solutions that, combined with opportunities for use in desired occupations, across multiple environments, and without prejudice, enable individuals' functioning and participation ^{2,3}.

Assistive products are any product (including devices, equipment, instruments and software), especially produced or generally available, used by or for persons with disability

- for participation;
- to protect, support, train, measure or substitute for body functions/structures and activities;
- or to prevent impairments, activity limitations or participation restrictions⁴.

Assistive technology services include any service that directly assists an individual in the selection, acquisition, or use of an assistive solution. Sometimes known as 'soft technologies' ², these include providing information and assessment, identifying and trialling assistive solutions, purchasing and customising the solution and ensuring ongoing and effective use, maintenance and review^{5,6}.

Assistive solutions represent the combination of assistive products and services tailored to an individual user's situation, including their environments and occupations of use ^{7,8}.

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Assistive technology is not *medical technology* (healthcare products used to diagnose, monitor or treat diseases or medical conditions), *rehabilitation technology* (devices focussed on the efficiency or effectiveness of clinical services or rehabilitation programs provided by health professionals, or *telehealth* (the technology-mediated delivery of health services).

The term **assistive technology** is used internationally, but not widely adopted in Australia, where the term *aids and equipment* is still in common use. Inconsistencies in understanding and vision may explain why AT provision remains inequitable and inefficient. Reaching a shared vision for defining, funding and deploying assistive technology is critical for its successful use.

2. Providing the essential steps of assistive technology provision

Assistive technology, appropriately provided, is effective in increasing autonomy, independence, health-related quality of life and productivity of individuals and their circles of support^{9,10}. Assistive technology decreases the societal cost of care and other services across the lifespan by enhancing economic and social participation, and limiting secondary complications and residential care admission for people with disability and chronic conditions¹¹.

Internationally recognised good practice steps for AT provision include information and assessment, identifying and trialling assistive solutions, purchasing and customising the solution and ensuring ongoing and effective use, maintenance and review^{5,6}. AT abandonment and non-use increases where these steps are fragmented, underfunded or not provided^{7,10}.

There are significant gaps in the availability of assistive products and services for different populations (by location, age, and need) and inconsistent eligibility criteria for funding from public and non-government sources. There is fragmentation of assistive technology provision, with many programs delivering particular assistive products or services, but few that fully support all good practice steps of identification, sourcing and ongoing use of individualised assistive solutions. AT users and AT practitioners may therefore find the funders and services they are working with do not follow these principles or provide all these steps. In these instances, good practice actions include identifying service gaps, seeking alternatives and systemic advocacy to improve provision systems.

3. Getting the right people involved in assistive technology provision

The individual user of the assistive solution is the centre of AT provision activities. AT users include people of all ages with any sort of impairment (e.g. sensory, physical, and cognitive), health or age-related condition. Appropriate attitudes, that is, the ability to be person-focussed, goal oriented and to work co-productively are essential attributes for all stakeholders working in AT provision. Other participants in assistive technology provision include family and friends, formal and informal caregivers, health and disability professionals, engineers and technicians, product designers, manufacturers and suppliers. Skills and knowledge regarding AT provision is drawn from education (including professional training), experiential knowledge and the AT evidence base. Competent AT practitioners will identify their personal scope of practice and will engage in communities of practice to support their ongoing learning. Overlapping knowledge domains may include specific AT device types, specific activity and participation areas, as well as specific impairment types or age groups of

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AT user¹². Different skillsets are indicated in different situations. This will depend on variables such as the nature of the AT user, their participation goals and their environments, as well as the complexity of the AT and related supports. Based upon these factors, building an individual AT solution may require:

- i. capability-building supports for the AT user and their circle of support;
- ii. skilled peer supporters; generalist AT practitioners with relevant fields of knowledge;
- iii. specialised AT practitioners or a combination of AT practitioners in the form of a multi-disciplinary team.

Clearly defining assistive technologies, endeavouring to deliver on the full range of AT service provision steps, partnering with all players and extending one's personal scope of practice, are hallmarks of excellence in AT practitioners.

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11. AATC 2016 ISSUES STATEMENT

AATC 2016 Issues Statement regarding Assistive Technology Provision in Australia

Developed by ARATA and reviewed and ratified by over 200 delegates of the 2016 AATC Conference, this Issues Statement accompanies the 'Statement on AT Good Practice' and identifies three key issues for AT in Australia.

Advances in technology are transforming the lives of people of all ages around the globe, enabling greater participation in a broad range of activities. Enhancing inclusion by enabling participation benefits everyone in society, and this is increasingly important in Australia, where an ageing population means an increasing number of people living with chronic conditions and disability. Assistive technologies (AT) are critical to the health and wellbeing of one in ten Australians, and national expenditure on AT exceeds \$4.4 billion¹. Access to quality assistive technology will enhance their political, social and economic participation and inclusion in Australian society.

This issues statement summarises key issues in assistive technology research and practice for the Australian context, requiring action.

ISSUE 1 Wholistic assistive technology provision

Definitions: The term assistive technology is used internationally, but not widely adopted in Australia, where the term *aids and equipment* is still in common use. Inconsistencies in understanding and vision may explain why AT provision remains inequitable and inefficient. Reaching a shared vision for defining, funding and deploying assistive technology is critical for its successful use (see glossary).

Funding and access: There are significant gaps in the availability of assistive products and services for different populations (by location, age, and need) and inconsistent eligibility criteria for funding from public and non-government sources, and so current Australian service provision does not fully meet human rights benchmarks^{2,3}.

Service provision: There is fragmentation of assistive technology provision, with many programs delivering particular assistive products or services, but few that fully support all good practice steps of identification, sourcing and ongoing use of individualised assistive solutions.

Actions

- ✓ **Awareness and recognition-** of the rights of people with disability to access assistive technology, and of its economic and social benefits to individuals and society.
- ✓ **Sufficient resourcing of and equitable access to** - assistive technology services that provide information, advice and support in finding and using assistive solutions, and to quality assistive products.
- ✓ **Coordination-** between mainstream and specialised services to ensure that assistive solutions are appropriate to each individual's situation, and to involve the assistive technology user in all activities and decisions
- ✓ **Agreed outcome benchmarks-** meeting human rights criteria and supporting the World Health Organisation definitions of human activity and participations⁴

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ISSUE 2 Identifying the full costs and benefits of assistive technology

The use of technologies to assist with activities and participation is pervasive, for example use of spectacles or information and communication technologies, and it can be difficult to isolate ‘naked performance’⁵ in order to fully realise the effectiveness of AT. The presence of environmental barriers or facilitators also plays a critical role in the experience of disability and the need for AT or related environmental adaptations.

From a health outcome perspective, AT is effective in increasing autonomy, independence, health-related quality of life and productivity of individuals and their circles of support^{6,7 8,9}. From a costs perspective, AT decreases the societal cost of care and other services across the lifespan by enhancing economic and social participation, and limiting secondary complications and residential care admission for people with disability and chronic conditions¹⁰. A range of studies provide methods to evaluate the economic impact of AT on an individual basis, such as social cost inventory analysis^{11,12}, health sector perspectives upon the cost offsets of AT¹³ and costing the impacts of lack of AT provision¹⁴.

Actions

- **Research:** There is insufficient rigorous research evidence to support the effectiveness of most assistive technology provision services and systems.
- **Practice-based evidence:** skilling the AT sector to collect outcomes data on current practice, utilise inclusive research methods and collaborate as a community of practice to add to the evidence base.

ISSUE 3 Matching attitude, skill and knowledge to user need in assistive technology provision

The individual user of the assistive solution is the centre of AT provision activities. AT users include people of all ages with any sort of impairment (e.g. sensory, physical, and cognitive), health or age-related condition. Other participants in assistive technology provision include family and friends, formal and informal caregivers, health and disability professionals, engineers and technicians, product designers, manufacturers and suppliers. Appropriate attitudes, that is, the ability to be person-focussed, goal oriented and to work co-productively are essential attributes for all stakeholders working in AT provision. Skills and knowledge regarding AT provision is drawn from education (including professional training), experiential knowledge and evidence-based practice. Competent AT practitioners will identify their personal scope of practice and will engage in communities of practice to support their ongoing learning. Overlapping knowledge domains may include specific AT device types, specific activity and participation areas, as well as specific impairment types or age groups of AT user¹⁵. Different skillsets are indicated in different situations. This will depend on variables such as the nature of the AT user, their participation goals and their environments, as well as the complexity of the AT and related supports. Based upon these factors, building an individual AT solution may require:

- i. capability-building supports for the AT user and their circle of support;
- ii. skilled peer supporters; generalist AT practitioners with relevant fields of knowledge;
- iii. specialised AT practitioners or a combination of AT practitioners in the form of a team.

Wholistic and consumer-centered assistive technology provision, provided by appropriately skilled practitioners, is a cost effective strategy to achieve life outcomes.

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Actions

- ✓ **Education-** to support the education and development of professionals and support staff
- ✓ **Quality or credentialing** policy and practice that is most likely to meet individual needs and deliver high-quality, sustainable outcomes for society

Glossary¹⁶⁻¹⁸

Assistive technology comprises products and services used to provide assistive solutions that, combined with opportunities for use in desired occupations, across multiple environments, and without prejudice, enable individuals' functioning and participation^{4,19}.

Assistive products are any product (including devices, equipment, instruments and software), especially produced or generally available, used by or for persons with disability

- for participation;
- to protect, support, train, measure or substitute for body functions/structures and activities;

or to prevent impairments, activity limitations or participation restrictions²⁰

Assistive technology services include any service that directly assists an individual in the selection, acquisition, or use of an assistive solution. Sometimes known as 'soft technology', these steps include providing information and assessment, identifying and trialling assistive solutions, purchasing and customising the solution and ensuring ongoing and effective use, maintenance and review^{17,21}. Good practice in AT service delivery includes these steps, and AT abandonment and non-use increases where these steps are fragmented, underfunded or not provided^{7,10}.

Assistive solutions represent the combination of assistive products and services tailored to an individual user's situation, including their environments and occupations of use^{22,23}.

Assistive technology is not *medical technology* (healthcare products used to diagnose, monitor or treat diseases or medical conditions), *rehabilitation technology* (devices focussed on the efficiency or effectiveness of clinical services or rehabilitation programs provided by health professionals, or *telehealth* (the technology-mediated delivery of health services).

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