



Australian Government



MediConnect
linking medicines information

Field Test Evaluation Findings



PREPARED BY TNS CONSULTANTS FOR THE
AUSTRALIAN GOVERNMENT
DEPARTMENT OF HEALTH AND AGEING

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Background

MediConnect (formerly called the Better Medication Management System or BMMS) was an Australian Government electronic health initiative developed to assist in reducing the incidence of adverse drug events and resultant hospitalisations by improving access to more complete medicines information for consumers and health care professionals. To achieve this, MediConnect was designed to be a secure national electronic medication record system that would draw together, in a centralised database, consumer medicines information held in the computer systems of different doctors, pharmacies and hospitals. Information about consumers' over the counter (OTC) medicines, complementary medicines and allergies could also be recorded, providing a more complete medication history.

The MediConnect system was developed jointly by the Australian Government Department of Health and Ageing (DoHA) and the Health Insurance Commission (HIC) in close consultation with health care professionals and consumer groups. Before proceeding to implement MediConnect widely, it was decided that a field test should be conducted to see if the system had the right features for key groups such as consumers, doctors, pharmacists and hospitals, and that it worked well. As a result, the MediConnect Field Test was conducted in two locations, Launceston, in Tasmania and Ballarat, in Victoria during 2003 and 2004.





About the Field Test

The *MediConnect* Field Test was designed to trial technical and business elements and processes in a practical environment. The objectives of the Field Test were to:

- test the *MediConnect* system as a whole to ensure that there was full integration of the policy, operational and technical components involved in registration, consent, lodgement and retrieval of prescription details, and business processes;
- test the performance of the operational and technical elements including the central *MediConnect* database, interfaces between prescription writing software and prescription dispensing software packages and the *MediConnect* functionality, the communications infrastructure, and the suppression of records ('blocking') and keyword functionality;
- test the effectiveness of the communication strategy including recruitment of providers (doctors and pharmacists) and consumers, education and training for providers, communication materials for consumers, and support mechanisms for participants;
- assess the ease and usefulness of *MediConnect* for participants; and
- identify any issues that need to be addressed prior to *MediConnect* being introduced nationally.

As field tested, *MediConnect* required consumers to register into the system, and then only with their consent could their *MediConnect* record be accessed by doctors, pharmacists and hospital staff. With the consumer's consent, doctors, pharmacists and authorised hospital staff were able to view past history on the medicines prescribed and dispensed by participating doctors and pharmacists. Consumers were given the ability to apply a keyword (password) to restrict access to their record and were able to block specified items in their record if they so wished.

For the Field Test, MediConnect functionality was integrated into existing prescription writing software and prescription dispensing software systems. In addition, authorised hospital staff were able to view the consumer's MediConnect record via a web browser, but could not edit or add to the record.

Access by health providers was controlled by Public Key Infrastructure (PKI), the government endorsed authentication system to secure online transactions through the use of digital keys and certificates.

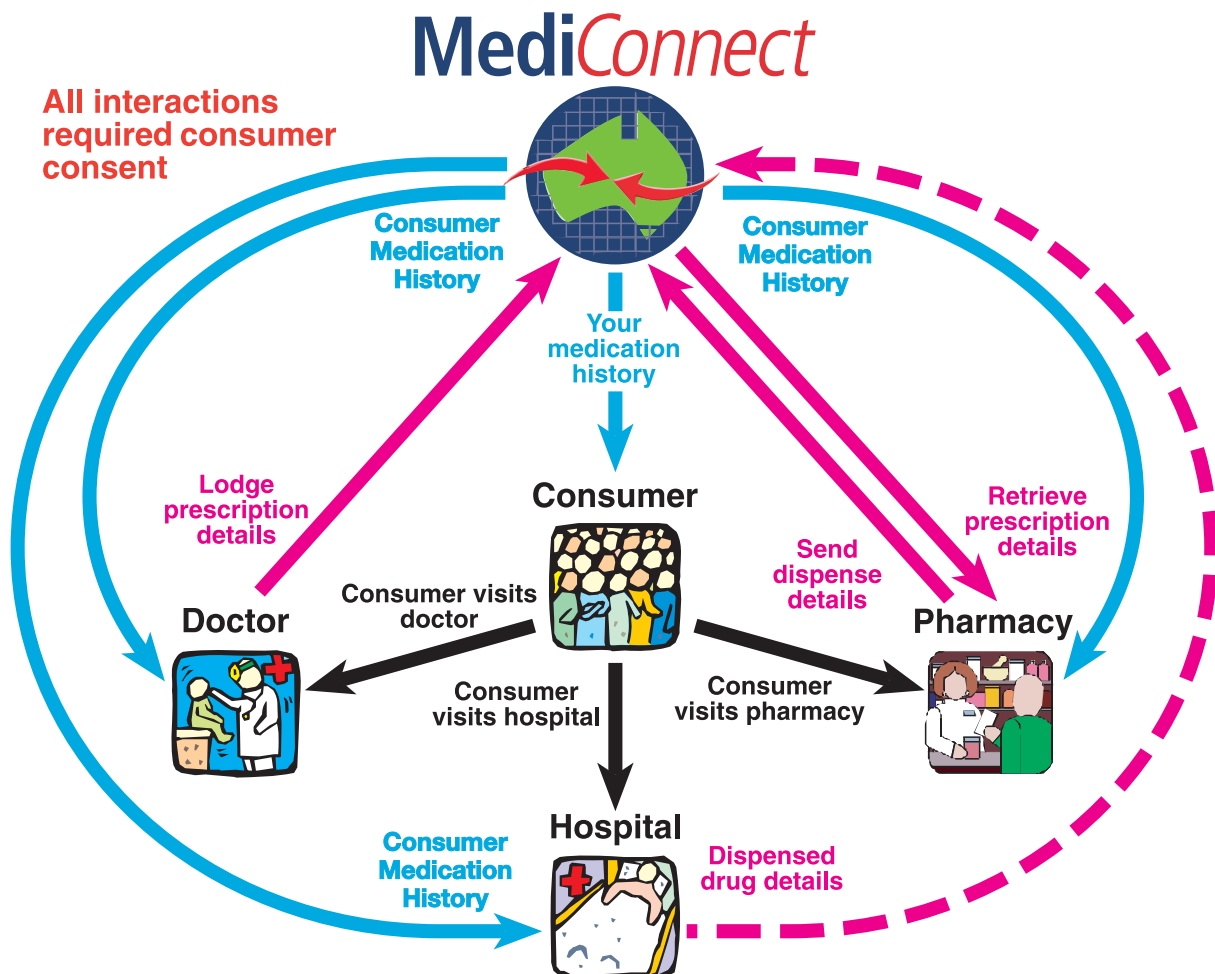
Two implementation phases were designed to test different aspects of MediConnect. Phase 1 was designed to test the technical aspects and feasibility of MediConnect functionality, its integration into the prescription writing or dispensing software, and the impact on workflow of doctors and pharmacists during installation, registration and consent processes. Phase 2 sought to test the system with full functionality, which included the integration of the privacy functions for consumers (for example keyword, blocking functions and emergency access consent), and the ability for providers to incorporate OTC medicines and background information on consumer records.



About the Field Test Evaluation

The Field Test was evaluated using a formative evaluation paradigm whereby research activities were conducted throughout the Field Test period. Four field visits were undertaken in each location.

The main evaluation input was qualitative research with participating general practitioners (GPs), pharmacists and consumers. In all 34 in-depth interviews were conducted with GPs, 41 with pharmacists and 140 with consumers. In addition, qualitative interviews were conducted with administrative staff in each of the two participating hospitals. The qualitative evaluation was complemented by quantitative data collected from the MediConnect system, participating health providers' computer systems and a survey of consumer participants and non-participants. Supplementary information was also obtained from the MediConnect enquiry line, participating software vendor companies, the MediConnect Field Test Support Teams and practical focus testing of the Field Test software with doctors and pharmacists.





Summary of findings

The Field Test demonstrated the ability to create a centralised medication record for consumers which could be accessed by participating GPs and pharmacists via a modified version of their existing prescription writing or dispensing software. A total of 110,774 messages were successfully sent throughout the course of the Field Test, representing the lodging of 9,295 prescriptions and the dispensing of 34,272 prescription medicines within the secure *MediConnect* environment. Some 42,503 accesses of the consumer medication history were recorded.

A total of 35 GPs in Ballarat and 27 GPs in Launceston participated in the Field Test. Eighteen pharmacies participated in Ballarat and 19 pharmacies in Launceston participated. A total of 3,120 consumers were recruited to take part in the Field Test – 1366 in Ballarat and 1754 in Launceston. Although the number of GPs recruited did not quite meet expectations, more pharmacies and more consumers were recruited than originally anticipated.

The specific evaluation findings are grouped according to the ten *MediConnect* evaluation domains.

System (Technical)

Although ultimately proven to work in practice, the implementation of *MediConnect* functionality within general practices and pharmacies did not proceed without problems. In particular, the IT environment within each practice and pharmacy was shown to be unique in terms of their readiness to handle a working *MediConnect* connection. Significant disruption was experienced in making the requisite upgrades and additions to the infrastructure at each site.

After installation, providers reported experiencing difficulties due to unreliable broadband services and slow dial-up connections. *MediConnect* transactions could not take place during service provider outages unless a mechanism was in place to 'store' *MediConnect* messages until the connection was re-established.

All pharmacies reported technical difficulties in getting barcode scanners to work (scanners were used to scan barcodes printed on *MediConnect* scripts), with barcodes printed by inkjet printers reportedly being the major culprit.

The Field Test software products caused their respective users problems for a host of reasons. The way the *MediConnect* functionality was integrated did not generally meet the goal of minimising the impact on workflow practices. For example, one prescribing product required users to enter their PKI pass phrase every time a message was to be sent to *MediConnect*, prompted for a





keyword for all consumers (regardless of whether they had one) and did not print the prescription form until after the *MediConnect* messaging was complete.

The other prescribing product required users to enter instructions regardless of whether they were necessary and catered only for numerical values in the dose field. One dispensing product did not cater well for multiple item scripts, returning users to the new dispense screen (where consent had to be confirmed) rather than allowing the barcode to be rescanned to automatically bring up the next item.

Although integral to the conceived benefits and design of *MediConnect*, drug to drug checking (ie automatic alerts to known adverse drug interactions) was not incorporated by software vendors for the purposes of the Field Test. Consultation with vendors suggested that drug to drug checking functionality between particular software products and the centralised *MediConnect* database could only be provided once a nationally consistent set of codes was developed and adopted.

Access to *MediConnect* records was successfully provided via a web interface in three hospital settings (the public hospitals in Ballarat and Launceston and an aged care facility in Ballarat).

Data Quality

Apart from one isolated incident of incorrect data being sent to *MediConnect*, messages were transferred between providers and *MediConnect* without error. In other words, the information sent to *MediConnect* from participating pharmacies and general practices was accurately transmitted and stored. Messaging rejections often took place where the information sent to *MediConnect* was inconsistent with that held by HIC (in Medicare records). Inconsistent Medicare numbers and date of birth were the most common areas of error (the mismatches had to be reconciled before consumers could be registered).

Data quality can also be viewed in terms of the completeness of medication records. By the end of the Field Test, largely incomplete medication histories were available, and were thought to be of little clinical use beyond the information stored locally. A key factor was that only 5% of all prescriptions dispensed to Field Test participants by participating pharmacies were Type A dispenses – where both the prescribing event and dispensing event are recorded by *MediConnect*. This low percentage means that the value of *MediConnect* to pharmacy of not having to transcribe prescription details

was reduced. Although there was no stated expectation for the completeness of medication histories by the end of the Field Test, the incompleteness of the records highlights a number of important issues.

- A significant amount of time would be required for individual medication histories to come near to being complete.
- The prospect of totally complete *MediConnect* records would require the *full* participation of *all* GPs and pharmacies.
- It is necessary for GPs and pharmacists to be able to identify consumers as *MediConnect* participants before their consent can be obtained in order to interact with their *MediConnect* record (consumers expected that this would happen automatically without the need for them to inform other health professionals).
- It was possible for GPs and pharmacists to prescribe/dispense outside of the *MediConnect* environment at their own discretion, resulting in incomplete records.
- Critical mass in terms of consumer participation would be required before health professionals would be motivated to ensure the accuracy and completeness of *MediConnect* records.

The addition of OTCs, allergies, adverse drug reactions and reason for treatment details to a consumer's *MediConnect* record was also performed very inconsistently in terms of providers actually adding this information according to consumer desire or the way in which the information was entered.

Privacy and Confidentiality

The *MediConnect* consent model and various privacy functions were designed to maximise consumer control over *MediConnect* records and restrict access to nominated health professionals. A large majority of *MediConnect* consumer participants surveyed agreed that their privacy would be well protected by *MediConnect* or similar e-health system and nearly all agreed that the information held about them would only be used in their health treatment.

However, the qualitative research with consumers found that the various consent options (standing consent for nominated providers or visit-by-visit consent) were complex to understand and did not cater for those who

wanted to grant wider access to health professionals.

In fact, a majority of *MediConnect* participants surveyed indicated that they wanted to grant access to all health professionals without having to be asked each time. All the consumers participating in the Field Test opted to provide ongoing consent to the health professionals who recruited them to the Field Test.

Although HIC data shows a proportion of consumers opting to use a keyword, the qualitative findings showed that many consumers thought they were required to have one (rather than specifically wanting one). What resulted was confusion upon the next visit to a GP or pharmacist, when the keyword was likely to have been forgotten. There were few instances where the keyword was used as intended (ie as a means of having control over access to the *MediConnect* record).

Similarly, the Phase 2 emergency access function (which gave hospitals and others permission to access *MediConnect* records in an emergency situation without consumer consent) had to be specifically enabled by consumers recruited during Phase 1, by responding to an HIC letter sent to them about the move to Phase 2. Many people did not respond to the letter and emergency access could therefore not be granted despite the fact that most people thought this was the main benefit of participating in *MediConnect* (and one of the reasons they had registered)¹.

Consumers often relied on the advice of their GP or pharmacist as to how to complete forms and what options to elect. It was clear from the evaluation activities that the mechanisms put in place to safeguard consumer privacy, such as the options to have a keyword or to choose to block certain records, did little to reassure people who were hesitant about it, but did add a great deal of complexity to what most thought was essentially a simple and innocuous system. Consumer needs, expectations and desires were not necessarily reflected in the 'settings' that they had (sometimes mistakenly) opted for. Problems with the implementation of these features in the transition to Phase 2 of the Field Test and of the emergency access feature (which gave hospitals and others permission to access *MediConnect* records in an emergency situation without consumer consent) meant that these features could not be fully tested and evaluated.

¹ It should be noted that the Federal Privacy Act currently makes provision for health professionals to access medical records without consent in the case of an emergency.

Access to Information

Consumers reported being very satisfied with the explanations that providers gave to them at the time of recruitment and, despite not necessarily being able to articulate all aspects of *MediConnect* and the Field Test, were comfortable that they had received all the information they needed. In fact, the survey research with consumers found that 95% were satisfied with the explanations provided. When asked what they would do in the event that they required further information, nearly all participants said that they would return to the provider who registered them. Some people made reference to the 1300 number (*MediConnect* Enquiry Line) and to the website.

Consumers were surprised but pleased to hear that they were able to obtain a copy of their medication history from a Medicare office or from a participating provider. However, few consumers had actually asked for a hard copy of their record at any point throughout the Field Test. When shown various versions of the Consumer Medication History report, it was clear that one size did not fit all and that a number of different formats should be made available.

Workflow and Support

It was clear that the process of registering consumers (reportedly taking anywhere from a few minutes to half an hour) represented the biggest impost on provider time. In a busy pharmacy or general practice environment, the obligation to recruit consumers for the Field Test did impact on workflows and, if multiplied across a larger number of patients would reportedly be

debilitating from a workflow point of view. The establishment of a working *MediConnect* connection (including hardware upgrade, PKI installation and software installation) also reportedly impacted on workflows, albeit for a short time only (one pharmacist reported having to hand write scripts for a period of about two hours).

In terms of the ongoing impact of *MediConnect*, the imposts were far less noticeable but small increases in consultation and dispensing times were reported, particularly where problems were encountered or where a lack of familiarity with the system existed. The logging of encounter times strongly supported this finding.

The keyword functionality presented a problem in pharmacy environments as consumers were required to be present at the actual time of dispensing in order to enter their keyword.

In the environment of hospital admissions, accessing *MediConnect* records did take time but mainly because of the need to log on each time. If accessing *MediConnect* records became part of normal practice, this time would be significantly reduced. In the hospital environment, the time taken to access *MediConnect* records was viewed favourably in comparison to the time taken to obtain this information through traditional means.

Education and Support

GPs, pharmacists and hospital staff reported a high degree of support provided by the local Divisions of General Practice (where representatives were appointed to



manage the local implementation of *Medi Connect*). In fact, this support was highly regarded by all participants interviewed and was considered crucial to their ongoing participation. The training provided on *Medi Connect* functionality and processes was also highly regarded though it was viewed by some more as a 'sales pitch' than as training. The main criticism here was that the training was delivered too long before working software was provided, meaning that much of what was learned was forgotten. Providers also called for more hands-on training and the ability to 'play around' with 'dummy' patients.

The support provided by the four software vendors differed from vendor to vendor, with one being largely inaccessible to end users and others providing hands-on support by visiting locations when necessary. GPs and pharmacists sometimes complained that it was difficult to know how to report a *Medi Connect* issue and to whom – the software vendors, HIC or the Division of General Practice.

Communication Strategy

The communications materials produced to support the registration process were thought to have good production values and to be clearly laid out and accessible for the lay reader. However, the amount of information was often said to be overwhelming and somewhat repetitive. The short brochure rather than the full booklet was found to be the most useful (and in fact, many providers ceased using the full booklet to aid in the explanation provided to consumers).

The letter sent to consumers to alert them to the introduction of Phase 2 caused a great deal of confusion. It prompted consumers both to nominate a keyword if they wanted one (which most people did not) and to grant consent for emergency access if they wanted to (which most people did want). It was clear from the evaluation that communication with consumers about complex concepts, particularly when delivered only in written form, could easily confuse rather than empower.

Providers reported that it was much easier to recruit participants when they had some pre-existing knowledge about the concept of *Medi Connect*. The local advertising campaigns designed to support the Field Test, although being modest in scale, did 'cut through' to the local communities. In fact, the consumer survey found that 50% of non-participants who claimed some awareness of *Medi Connect* said that they had heard about it through mainstream media channels. Presentations given to community-based organisations also generated some awareness and led to the participation of a number of people.

Participation

Consumer participation was driven by an attraction towards the concept of *Medi Connect*, in particular, the creation of a medication record that could be accessed in an emergency, while travelling or when changing to a new doctor or pharmacy. A desire to 'help out' by taking part in the trial was also a motivator. The endorsement of health professionals and the explanations provided by them were also a key influence. Providers reported that the people who declined to take part did so because of apathy towards the concept, because of the apparent complexity or because of mistrust in government. General concerns about the security of the information did apparently exist but not to a great extent.

Consumers had little sense of participation beyond the initial registration process. It was their belief and their expectation that their *Medi Connect* record was being interacted with and maintained 'in the background'. Only 25% of participating consumers surveyed said that their GP had mentioned anything about *Medi Connect* after the initial registration (and 21% said that their pharmacist had mentioned it).

Providers participated in the Field Test for a variety of reasons including a desire to trial something that they thought was a good idea, to be at the forefront of new technology/initiatives and/or to gain some market advantage over their competitors. The financial incentive to participate and the provision of new computer hardware and Internet connections were also clear motivators for most.

Satisfaction

Consumers were generally very satisfied with their participation in the *Medi Connect* Field Test. In fact, 87% of consumer participants surveyed were satisfied (with a further 10% being ambivalent). Consumers were extremely satisfied with the brochures and information materials provided, the initial explanations provided by the GP or pharmacist and the forms they were required to sign for registration. This is inconsistent with the feedback provided by GPs and pharmacists who generally thought the printed information was verbose and the forms difficult for consumers to complete. The large number of errors evident on completed forms would also suggest that the forms could be improved.

The only area where satisfaction among consumers was not high was with the communication with providers subsequent to the initial registration (only 46% of consumer participants surveyed were satisfied). This was consistent with the qualitative findings in that many consumers reported that little mention was made of *Medi Connect* after the initial registration.



Summary

The *MediConnect* Field Test proved to be an extremely useful project in terms of the lessons learned for future implementation of electronic health initiatives. As a Field Test, it was successful in allowing evaluation of most functions and processes, although the low adoption of some options meant that they were not fully evaluated. Some of the important lessons that emerged were:

- the critical success factors for engaging health providers and consumers in such a system included the communication mechanisms and intensive support required to manage the changes involved;
- the recognition of the public good over concerns relating to potential breaches of privacy;
- the need for clear rules of engagement with the software industry; and
- the need for certain key components to be in place in order to make the system work efficiently and appropriately (for example, agreement on and consistency in the delivery of the technical specifications, adoption of standardized terminology, availability of adequate communications technology to enable the system to function efficiently, consistency in the level of technical support provided to end-users).

If *MediConnect* or other electronic health initiatives are to be implemented and made sustainable, a number of key technical and policy issues would need to be revisited.

- The clinical worth of electronic health records, as the prime motivator for provider participation, will only be realised once critical mass is reached. Better mechanisms need to be developed for encouraging provider and consumer participation in the interim period.
- Workflow is also a critical determinant of participation and sustainability. The point of care registration process and the consent model used in the Field Test would need to be modified and streamlined, and the feasibility of alternative registration models explored (for example, centrally managed registration, Internet-based registration), so as to reduce the imposts on provider time and to cater for consumers wanting to grant more liberal access to their medication information.
- The software functionality and electronic health record interface would need to work in a much more integrated and seamless way so as to support and align with, rather than interrupt, established work practices.

Dissatisfaction was evident among providers in relation to several of the concepts inherent in *MediConnect* – the blocking and keyword functionality and the registration/consent model in particular. They were also, to varying degrees, dissatisfied with the way *MediConnect* functionality was integrated into their prescription writing or dispensing software. Dissatisfaction was also evident in relation to the disruption caused by the initial installation, the nature of the initial participation agreements and the timeliness of incentive payments and reimbursements for hardware upgrades.

However, many providers conceded that the purpose of the Field Test was to allow evaluation of concepts and processes and, in this sense, most were happy to have participated. It was generally thought that the Field Test was well managed. It was unfortunate though, according to some providers, that few changes were made to the Field Test as a result of the feedback they provided along the way.

Cost Structure

Although the incentive payments made to providers were equal, reimbursement for capital outlay for computer hardware was based on an assessment of need. What resulted was a process where large upgrades were provided to some practices and pharmacies and smaller upgrades were provided to others. Some providers who received smaller reimbursements complained that they had been 'penalised' for being 'ahead of the game' and that no reimbursement was provided for recent expenditure in lieu of the need to accommodate new government initiatives.

The cost of preparing general practices and pharmacies for participation in the Field Test was significant. Internet connections (including one satellite connection) were provided, along with new computers and servers and blue tooth keyboards and keypads. The sustainability of this approach if applied nationally would have to be questioned.



Where can I get more information?

You can find out more from the *MediConnect* website:

www.medicconnect.gov.au



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