



Technical & Design Strategy Overview of Northern Territory HealthConnect P2P Electronic Transfer of Prescriptions Implementation Project

1. Overview

The ETP implementation in NT is a multi-phased project, designed to leverage off the significant NT healthcare community participation in the P2P secure messaging initiatives and overlay on this the capability for prescriptions to be created, signed, encrypted and sent in multiple community prescribing/dispensing settings in the NT.

This is a HealthConnect sponsored initiative and involved in the governance and steering are NT Health, TEDGP, Dept Health & Aging (eHealth Branch), Medicare Australia, HeSA and ArgusConnect.

The ultimate aim is to implement a scaleable, sustainable mechanism for prescriptions to be transferred electronically in the ordinary community GP/pharmacy setting. In order to achieve this, it is assumed that the principle of freedom of patient choice of dispensing pharmacy must be preserved and the technical solution implemented must not compromise this freedom in any way. It is therefore assumed that the ultimate technical model will involve a mechanism for 'parking' prescription records securely at a location where the pharmacy chosen by the patient may access the record and pick up the prescription details.

In order to achieve this ultimate model, a number of technical, work-practice and legal issues were needed to be resolved along the way, and hence it was decided that a 'phased approach' would be adopted so that many of these issues could be addressed; first within the context of a technically simple model and then proceeding to the possibly more complex community prescribing model.

Prescribing for Aged Care Facility residents was chosen by the participants as a health system context which could potentially deliver immediate benefits to all stakeholders, one that could be constrained to be achievable quickly as a phase 1 implementation, and one that could be used to test issues that would inform subsequent phases. It was also accepted that some technical simplifications could be adopted for this phase 1 implementation in order to achieve rapid development and implementation, with the expectation that these would be revised and redesigned during subsequent phases without risking 'lock-in' on technical solutions; especially in areas where standards were still evolving. Importantly, prescribing for Aged Care residents can be implemented as a 'push' model in environments where pharmacies contract to specific Nursing Homes, where the recipient pharmacy is predetermined thus allowing the use of current P2P messaging infrastructure (Argus).

Phase 1 had a 3 month rapid development cycle and was installed for live operation in the 3rd week of December 2006.

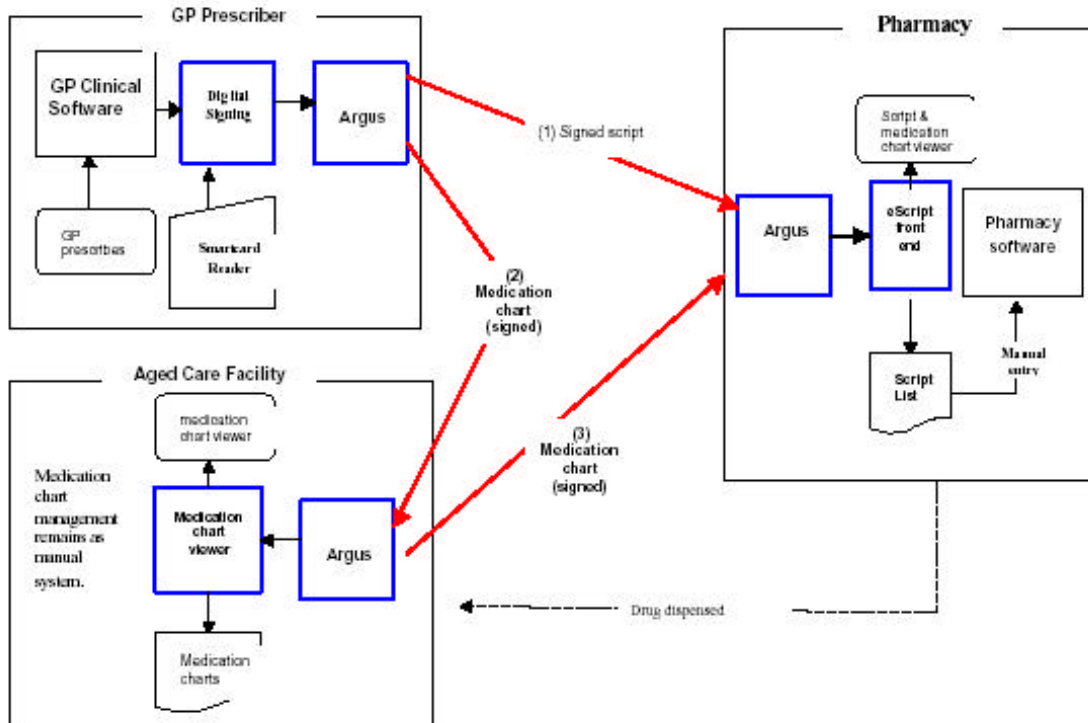
The main goal; *community GP and pharmacy prescribing and dispensing* is planned as phase 2, with the assumption that evolving standards such as Web Services definitions, message data-set definitions, medication identification, and message structure definitions will have become available by that time, and that appropriate legislation, regulation and business processes around Government requirements will have clarified by that time. Clearly, a more complex technical infrastructure will be necessary for phase 2 because the 'push model' will not serve the requirement of patient choice of pharmacy. However many of the mechanisms developed for the phase 1 'push model' will be re-used in phase 2, but implemented in a 'store-and-pickup model'.

Phase 2 will also aim to work in collaboration with as many of the main GP clinical software and dispensing software vendors as possible to develop and implement enhanced integration with these products so that significant leaps in user efficiency and reduction in human error can be achieved in the prescribing process.



2. Phase 1: Aged Care Facility prescribing

Phase 1 (Dec 06) – Nursing Home Scripts (ACF without prescribing software)



Functionality Walkthrough

- Prescription generated by GP in normal manner within MD2 and *Digital Signing Component* captures script output and presents to GP for signing. Signed script sent off by Argus directly to pharmacy. (1)
- GP 'prints' Medication Chart' to Argus and *Digital Signing Component* captures Chart output and presents to GP for signing. Signed Med Chart sent off by Argus directly to Nursing Home. (2)
- Pharmacy Script and Med Chart viewer receives and files signed Scripts and checks digital signatures with *Signature Authentication Component*. Pharmacy may view and print received Scripts for internal processes.
- Nursing Home Chart Viewer receives and files signed Med Charts and checks digital signatures. Nursing Home may view and print received Med Charts for internal processes.
- Med Charts checked by Nursing Home against existing records and if confirmed, sends signed Med Charts on to nominated pharmacy.
- Pharmacy Script and Med Chart viewer receives and files signed Med Charts and checks digital signatures with *Signature Authentication Component*. Pharmacy may view and print received Med Charts for internal processes.

Main Issues to be Tested in Phase 1

Work-flow issues for GPs in using individual smartcard tokens for prescribing.

Work-flow/clinical implications to GPs in cases when smartcard is unavailable.

Efficiency implications to pharmacies especially in eradicating 'outstanding scripts' management.

User issues for verifying veracity of signatures.

Technical viability of digital signing component.

Technical viability of signature authentication component.

Viability of failure rectification processes.

Legal and regulation acceptability (NT & Cwlth) of processes.

Medicare business acceptability of processes.

Essential Technical Components of Phase 1

- Development of a de-coupled digital signing component using individual smartcard tokens, with functionality suitable for GP setting. (Open Source and usable by software other than Argus)
- Development of a de-coupled digital signature authentication component. (Open Source)
- Development of a printer-driver component to capture clinical software output for signing and passing to Argus. (Interim measure to reduce dependency on software vendors to implement specific interfaces)
- Development of custom document viewer components for Nursing Homes and pharmacies. (Interim measure to reduce dependency on software vendors to implement document-handling within their own software).

Design Constraints and Simplifying Assumptions in Phase 1

- Uses a 'push model' for messaging; ie prescription is sent to a known recipient pharmacist.
- Utilises Argus in its current standard form using SMTP/POP (email) as the transport mechanism.
- Capture of prescription data would be by using the 'script.out' file of MD2 which exports data from each script produced; thus avoiding the need for any custom interface modification of MD2.
- Capture of each Medication Chart would be by printer-driver capture of the Chart when printed and passing to Argus.
- The captured data would be transformed into an HL7 message as close to a valid ORM pharmacy message as possible. The prescription HL7 message would contain both an image of the prescription in HTML as well as atomized medication data. The Med Chart HL7 message would be a REF message containing an image '.png' component.
- Medications would only be identified by their textual description because they will only be viewed or printed in this first phase. No application interoperability with dispensing systems would be required in this phase and hence no medication coding would be necessary.
- Digital signing of Medication Charts and prescriptions would be performed by a Web services-based module that would capture the document after it has been passed out of the clinical package.
- No interface would be attempted with dispensing software; pharmacies will simply be able to view and print prescriptions and Medication Charts and then process these in the current way. (integration with all clinical and dispensing software will be attempted in phase 2)
- Aged Care facilities would be provided with a stand-alone Medications Chart viewing and printing software module with the capability of on-forwarding signed Medication Charts to the nominated pharmacy.

It is known that many of these simplifying design assumptions would not be scaleable across the entire Aged Care prescribing domain and would not be appropriate for normal community prescribing, however the intention is that this initial phase is designed to 'field-test' some aspects of the electronic transfer of prescriptions but avoid many of the complexities and exception cases of full scale community prescribing. Having solved and tested the basic issues, the team will be more equipped to move to the more complex model of community prescribing. Some of these simplifying strategies and assumptions adopted for this Aged Care prescribing setting will be revised when the Aged Care prescribing process is later integrated into the broader community prescribing model.

Technical Notes re Phase 1

Clinical software interface for prescriptions:

'SCRIPT.OUT' file produced by MD2 is polled and most recent records captured, HL7-wrapped and passed to the digital signing component.

Clinical software interface for Medication Charts:

Printer-driver program captures printed output, converts to .png format plus ASCII, scrapes document for relevant patient and ACF information, HL7-wrapped and passed to the digital signing component.

HL7 message specification:

Prescription message HL7 2.3.1 ORM_O01 with atomized medication value fields and the OBX containing prescription image in HTML. Conforms with AS4700.3 (for specification refer to ['P2P ETP Message Specification - Prescription Phase1'](#))

Medication Chart message HL7 2.3.1 REF_I12 message with single OBX segment containing .png image of Chart.

Medication identification:

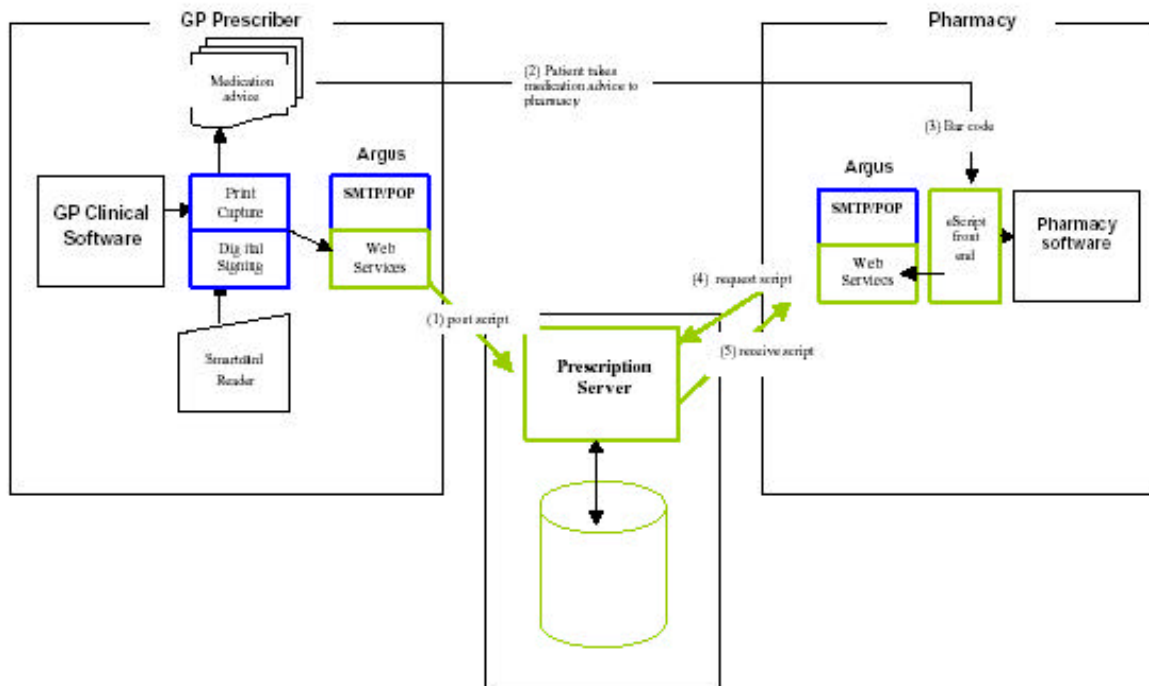
Text medication description, text formulation, and amount. No codes.

Provider identification:

As required by receiving clinical systems: text doctor name in format <prescriber number>+<doctor name> (title, firstname,lastname).

3. Phase 2: Community GP prescribing/community pharmacy dispensing

Phase 2 (Q3 07) – Introduce Web Services and Prescription Server for Community Prescribing/Dispensing



As described earlier, the community prescribing model to be adopted in order to support complete freedom of patients to attend their pharmacy of choice (the choice being possible after the doctor visit and prior to attending a pharmacy) will be to send the prescription record to a intermediate 'prescription server' and this record will be 'picked up' by the pharmacy when the patient later attends the pharmacy.

Essential Technical Components of Phase 2

- Development of web services capability into the messaging facility (Argus) [compliant with NeHTA directions].
- Development of a 'Prescription Server' facility based on XDS principles with web services communications capability. Server to be housed at secure location of choice in NT.
- Development of prescription data interfaces by GP clinical software vendors including possible interface with Medicines Catalog Server for NeHTA-specified unique identification of prescribed substances.
- Development of prescription data interfaces with dispensing software products. Including mechanism for scanning bar code on patient-held 'medication advice' to identify prescription to be accessed from 'Prescription Server'.