# CHRONIC CONDITIONS Care Plan Storyboard – V0.5

# (HL7 Patient Care Work group 2012-01-06)

1 INTRODUCTION

1. Specific information for the Storyboard Reviewer(s)

Domain experts are invited to review this storyboard (SB) to determine its clinical accuracy, adequacy/completeness and representativeness in supporting the development of Care Plan models for adequately communicating chronic condition management among relevant health care provider persons and organisations.

The following are suggested questions aiming at providing boundary and scope to help focus the reviewer comments:

* Is the overall story and workflow representing a typical situation? What changes would you suggest to make it more illustrative?
* Is it clinically accurate?
* Is the information exchanged between providers and organization accurate without going into the details that may be specific to a jurisdiction or country? (Appendix B can be enriched with more details or examples)

Please provide comments directly on this document (using the *Track Change* mode or *Insert Comment* feature of the Word software). Alternative all comments can be captured in a separate document and referencing directly the sections, subsections, line number which the comments are intended to address.

Please provide comments and feedback to the HL7 Care Plan Initiative Co-Lead:

* Stephen Chu (Australia), Phone: +61 7 3023 8448 or +61 416 960 333
  + email: stephen.chu@nehta.gov.au)

Kindly give us your name and coordinates:

* Reviewer name:
* Title, organization, jurisdiction, country:
* email address:
* Contact phone number(s)

Notes: Readers can find a brief glossary in Appendix A and short descriptions of information created and exchanged in Appendix B. Quoted references are listed in Appendix C.

* 1. Introduction to HL7 Care Plan Storyboards

HL7 International Patient Care Work Group (PCWG) ([http://wiki.hl7.org/index.php? title=Patient\_Care](http://wiki.hl7.org/index.php?%20title=Patient_Care)) has launched a new initiative, the Care Plan Initiative Project 2011, (<http://wiki.hl7.org/index.php?title=Care_Plan_Initiative_project_2011>) to conduct a Domain Analysis Process (DAP) for Care Planning that will lead to updating the existing Draft For Trial Use (DSTU) version. The resulting Domain Analysis Model (DAM) will be an analysis model that describes business processes, use cases, process flows, business triggers, and the information exchanged that are derived from a project's requirements. A DAM is equivalent to a Requirements Analysis Specification and contains not only an information model but also a comprehensive analysis model which includes business processes, system interactions and behavioral/dynamic aspects. The focus is on interoperability in information sharing among different health care actors (i.e. providers, organizations, patient, other carers). (Ref 1, HL7 HDF 1.5)

Storyboards are one of the first deliverables of the initiative. A storyboard is a narrative description of a series of steps involving some exchange of information between different participants to achieve the objectives of a healthcare business process. The list of steps can be in generalized, abstract terms, or in the form of a real-world example.

The PCWG has identified six stories that would provide sufficient coverage of situations for the HL7 Care Plan DAM:

* Acute Care
* Chronic Care
* Home Care
* Pediatric and Allergy/Intolerance
* Perinatology
* Stay healthy/ health promotion

A storyboard content is developed primarily from guidance by the domain experts. Some guidelines in preparing a SB:

* Focused on one typical story, not on exceptions
* Is written in common clinical term, not in technical or IT terms (is architecture, implementation and platform independent), and it uses business terminology to illustrate the context for the message exchange, functional model, etc.
* Focused on the exchange of information about care plan; a clear distinction is made between Care Plan information and medical record information or other non care plan specific data (e.g. lab results, referral request)
* Identifies what should be a best practice in the exchange of clinical information, i.e. what is described here may not be the reality in some cases.
* Subjected to the VACCI test: Validity, Accuracy, Completeness, Clarity and Integration (that all the components are well interconnected/integrated and the flows of events are logical and smooth)

Note: general comments received outside of the regular HL7 Patient Care Work Group meetings will be captured in section 3.6. Eventually, these comments from all the storyboards will be inputs to the statement of requirements for the care plan.

Short Description of the Health Issue Thread covered in the Storyboard

The purpose of the chronic conditions care plan storyboard is to illustrate the communication flow and documentation of a care plan between a patient, his or her primary care provider and the home health specialists involved in the discovery and treatment of a case of Type II Diabetes Mellitus. This health issue thread (simplified) consists of four encounters, although in reality there could be many more encounters:

1. Primary Care Physician Initial Visit
2. Allied Health Care Provider Visits
3. Hospital Admission
4. Primary Care Follow-up Visits

Brief descriptions of the information exchanged are provided in Appendix using a IDnnn code as cross reference.

Care coordination should occur throughout the health issue thread, across several care settings and several care providers/givers. It is briefly discussed later in this document, after the series of encounters.

2 Storyboard Actors and Roles

Primary Care Physician

Dr. Patricia Primary

Patient

Mr Bob Individual

Diabetic Educator

Ms Edith Teaching

Dietitian/Nutritionist

Ms Debbie Nutrition

Exercise Physiologist

Mr Ed Active

Optometrist

Mr Victor Vision

Pharmacist

Ms Susan Script

Podiatrist

Mr Barry Bunion

Psychologist

Mr Larry Listener

Hospital Attending Physician

Dr. Allen Attend

***3 STORYBOARD CONTENTS***

3.1 Encounter A: Primary Care Physician Initial Visit

### 3.1.1 Pre-Condition

Patient Mr Bob Individual attends his primary care physician (PCP) clinic because he has been feeling generally unwell in the past 7-8 months. His recent blood test results reveal abnormal glucose challenge test profile.

### 3.1.2 Description of Encounter

Dr Patricia Primary after reviewing Mr Individual’s medical history, presenting complaints and the oral glucose tolerance test results concluded that the patient suffers from Type II Diabetes Mellitus (Type II DM).

Dr Primary accessed Mr Individual’s medical record, records the clinical assessment findings and the diagnosis.

Dr Primary discusses with Mr Individual the identified problems, potential risks, goals, management strategies and intended outcomes. After ensuring that these are understood by the patient, Dr Primary begins to draw up a customized chronic condition (Type II DM) care plan based on a standardised multi-disciplinary Type II DM Care Plan adopted for use by her practice. Agreed goals and scheduled activities specific for the care of Mr Individual were entered into the new care plan.

Dr Primary also discusses with the patient the importance of good nutrition and medication management and exercises in achieving good control of the disease, as well as the criticality of good skin/foot care and eye care to prevent complications. Scheduling of consultations with diabetic educator, dietitian, exercise physiologist, community pharmacist, optometrist, and podiatrist (allied health care providers) is discussed and agreed to by the patient. The frequency of visit to allied health care providers is scheduled according to national professional recommendation for collaborative diabetes care[[1]](#footnote-1).

Dr Primary also notices signs and symptoms of mood changes in the patient after the diagnosis is made. She recommends that the patient may benefit from seeing a clinical psychologist to which the patient also agrees.

Dr Primary generates a set of referrals to these allied health care providers. The referrals contain information about the patient’s medical history including the recent diagnosis of Type II diabetes, reasons for referral, requested services and supporting clinical information such as any relevant clinical assessment findings including test results. A copy of the care plan agreed to by the patient is attached to the referral.

### 3.1.3 Post Condition

Once the care plan is completed, it is committed to the patient’s medical record. The patient is offered a copy of the care plan.

A number of referrals in the form of notification/request for services (Exchange-1) together with a copy of integrated care plan (Exchange-2) are sent to the relevant health care providers

The patient is advised follow the referral practice/protocol specific to the local health care system or insurance plan. For the first appointment, the patient may wait for scheduled appointments from the relevant health care providers to whom referral/request for services have been sent, or may be able to schedule his own appointment using booking systems of the specialist or allied health providers.

* 1. Encounter B: Allied Health Care Provider Visits

### 3.2.1 Pre-Condition

Individual allied health care provider has received a referral with copy of care plan from Dr Patricia Primary.

The allied health care provider has accepted the referral and scheduled a first visit with the patient – Mr Bob Individual.

The case has been assigned to the following individual allied health care providers:

* Ms Edith Teaching (Diabetic Educator) for development and implementation of comprehensive diabetic education program and plan to ensure that the patient understands the nature of the disease, the problem, potential complications and how best to manage the condition and prevention of potential complications
* Ms Debbie Nutrition (Dietitian/Nutritionist) for development and implementation of a nutrition care plan for diabetes to ensure effective stabilization of the blood glucose level with the help of effective diet control
* Mr Ed Active (Exercise Physiologist) for development and implementation of an exercise regime
* In certain country (e.g. Australia), the community pharmacist (Ms Susan Script) provides patient with education on diabetic medications prescribed to the patient by Dr Primary, and development and implementation of an effective and safe medication management program. The objectives are to gain and maintain effective control of the condition and to prevent hypo- and hyper- glycaemic episodes.
* Mr Larry Listener (clinical psychologist) for counseling and to develop and implement an emotional support program; this would include a plan to reduce the impact of emotional stress brought about by the newly diagnosed condition and to improve the patient’s psychological well being. The plan may include enrolling patient in diabetic support group.
* Mr Victor Vision (Optometrist) for regular (e.g. 6 monthly) visual and retinal screening and to educate patient on the eye care and how best to prevent/minimize the risks of ocular complications
* Mr Barry Bunion (Podiatrist) for education on the risks of foot complications and to develop and implement an effective foot care program including regular self-assessment and care of the feet and follow-up visits.

### 3.2.2 Description of Allied Health Care Provider Encounter

The patient Mr Bob Individual is registered at the allied health care provider’s reception. Any additional or new information provided by the patient is recorded in the health care record system operated by the allied health provider clinic.

During the first consultation, the allied health care provider reviews the referral and care plan sent by Dr Primary.

During subsequent consultation, the allied health care provider reviews the patient’s health care record and most recent care plan of the patient kept in the allied health care provider care record system.

At each consultation, the allied health care provider reviews the patient’s health record, assesses the patient, checks the progress and any risks of non-adherence (compliance) and complications, and discusses the outcomes of the management strategies and/or risks, Any difficulties in following the management strategies or activities by the patient are discussed and new/revised goals and timing as well as new intervention and self care activities are discussed and agreed to by the patient. The new/changed activities are scheduled and target dates agreed upon.

The allied health care provider updates the clinical notes and the care plan with the assessment details, and any changes to the management plan including new advices to the patient. The date of next visit is also determined.

Table 1. Allied Health Encounter – Activities and Outcomes

|  |  |  |  |
| --- | --- | --- | --- |
| **Provider / Allied Health Provider** | **Encounter Activities** | **Outcomes** | **Communications** |
| Diabetic Educator | Review referral/patient progress  assess learning needs and strategy  discuss and finalise education plan | Develop/update education plan  Update clinical notes  Generate progress notes | New/updated education plan to patient  Summary care plan and progress note to primary care provider and to others, e.g. dietitian, pharmacist, etc |
| Dietitian/Nutritionist | Review referral/patient progress  Assess diet management needs and strategies  Discuss and finalise diet management plan | Develop/update diet plan  Update clinical notes  Generate progress notes | New/updated care plan to patient  Summary diet plan and progress note to primary care provider and to others, e.g. diabetic educator, exercise physiologist, etc |
| Exercise Physiologist | Review referral/patient progress  Assess exercise/activity needs and strategies  Discuss and finalise exercise plan | Develop/update exercise plan  Update clinical notes  Generate progress notes | New/updated exercise plan to patient  Summary care plan and progress note to primary care provider and to others, e.g. diabetic educator, dietitian, etc |
| Community Pharmacist | Review patient medication profile  Assess medication management (education, conformance, etc) needs and strategies  Discuss and finalise medication management plan | Develop/update medication management plan  Update clinical notes  Generate progress notes | New/updated medication management plan to patient  Summary care plan and progress note to primary care provider and to others, e.g. diabetic educator, dietitian, etc |
| Clinical Psychologist | Review referral/patient progress  Assess emotional status, coping mechanisms and strategies  Discuss and finalise psychological management plan | Develop/update psychological management plan  Update clinical notes  Generate progress notes | New/updated psychological management plan to patient  Summary care plan and progress note to primary care provider and to others, e.g. diabetic educator, pharmacist, etc |
| Optometrist | Review referral/patient progress  Assess eye care needs and strategies  Discuss and finalise eye care plan | Develop/update eye care plan  Update clinical notes  Generate progress notes | New/updated eye care plan to patient  Summary care plan and progress note to primary care provider and to others, e.g. diabetic educator, pharmacist, etc |
| Podiatrist | Review referral/patient progress  Assess foot care needs and strategies  Discuss and finalise foot care plan | Develop/update eye care plan  Update clinical notes  Generate progress notes | New/updated foot care plan to patient  Summary care plan and progress note to primary care provider and to others, e.g. diabetic educator, dietitian, pharmacist, etc |

### 3.2.3 Post Condition

An updated allied health domain specific care plan complete with action items and target dates is completed with patient agreement.

The patient is given a copy of the new/updated care plan at the end of each allied health consultation.

At the end of each consultation a progress note is written by the allied health provider which documents the outcomes of the assessment, any new risks identified and changes to or new management strategies that have been included in the updated care plan. This allied health domain specific progress note (Exchange-3) is sent to the patient’s primary care provider, Dr Primary. Any care coordination responsibilities required of Dr Primary is also communicated to her. The progress note (Exchange-4) is also sent to any other allied health care provider(s) who may need to be informed about changes in risks, goals, management plan that are relevant to their ongoing management of the patient. For example, progress note from a dietitian/nutritionist may contain clinical information that may need to be considered by the diabetic educator.

* 1. Encounter C: Hospital Admission

### 3.3.1 Pre-Condition

Mr Bob Individual took a 3-month holiday in Australia during the southern hemisphere spring season, missed the influenza immunization window in his northern hemisphere home country, and forgot about the immunization after he returned home. He develops a severe episode of influenza with broncho-pneumonia and very high blood glucose level (spot BSL = 23 mM) as complications. He suffers from increasing shortness of breath on a Saturday afternoon.

Mr Individual presents himself at the Emergency Department of his local hospital as Dr Primary’s clinic is closed over the weekend.

### 3.3.2 Description of Encounter

Mr Individual is admitted to the hospital and placed under the care of the physicians from the general medicine clinical unit.

During the hospitalization, the patient is given a course of IV antibiotics, insulin injections to stabilize the blood glucose level. Patient was assessed by hospital attending physician, Dr Allen Attend, as medically fit for discharge after four days of inpatient care. Dr Attend reconciles the medications to continue, outlines follow up information and discusses post discharge care with the patient. He recommends the patient to consider receiving influenza immunization before the next influenza session and updates this as recommendation to Dr Primary in the patient’s discharge care plan.

Planning for discharge is initiated by the physician and nurse assigned to care for the patient soon after admission as per hospital discharge planning protocol. The discharge care plan is finalized on the day of discharge and a discharge summary is generated.

### 3.3.3 Post Condition

The patient’s discharge care plan is completed. This plan may include information on changes to medications, management recommendations to the patient’s primary care provider and the patient, and any health care services that are requested or scheduled for the patient.

The patient is given a copy of the discharge summary that includes the discharge care plan.

A discharge summary (Exchange-5) with summary of the discharge plan (Exchange-6) is sent to the patient’s primary care provider, Dr Primary with recommendation for pre-influenza season immunization.

* 1. Encounter D: Primary Care Follow-up Visits

### 3.4.1 Pre-Condition

Patient Mr Bob Individual is scheduled for a post-hospital discharge consultation with his primary care provider, Dr Primary

Mr Individual is seen by Dr Primary at her clinic on the day of appointment.

The discharge summary information from the hospital is incorporated into the patient’s medical record and is ready for Dr Primary to review at the consultation.

### 3.4.2 Description of Encounter

Primary Care Physician Dr. Patricia Primary reviews patient Mr Individual’s hospital discharge summary and discusses the pre-influenza season immunization recommendation with the patient. The patient agrees with the recommendation. The care plan is updated.

Dr Primary notices that the patient has gained extra weight and the blood sugar level has not quite stabilised after discharge from hospital. Dr Primary reviews the care plan and discusses with patient the plan to change the diet and medication. Patient agrees. The care plan is updated.

Dr Primary issues a new prescription to the patient, and asks the patient to make an early appointment to see the dietician to discuss new nutrition management strategy and plan.

Progress notes with nutrition management and exercise change recommendations are generated by Dr Primary and sent to the patient’s dietitian. The integrated care plan is updated and sent to relevant allied health providers

Dr primary changes patient’s follow-up visits from four monthly to two monthly for the next two appointments with the aim to review the follow-up frequency after that.

### 3.4.3 Post Condition

A new prescription (Exchange-7) is sent to the patient’s community pharmacy. Ms Script will discuss the new medication management plan with the patient when he goes to pick up his medications.

The patient also makes an early appointment to see the dietitian and exercise physiologist. A copy of progress notes (Exchange-8) from Dr Primary will be received by the dietitian and exercise physiologist before the scheduled appointment.

Patient gets a copy of the updated care plan. Integrated care plan also sent to relevant allied health providers (Exchange-9).

4. About Coordination of Care

The initial coordination of care provided by all providers would be under the responsibility of the hospital attending physician. This coordination role would then be transferred formally to the primary care physician who may work with a community care coordinator.

The following sections present general observations about the coordination of care in similar situations, and present various models of care coordination.

### 4.1 General Observations about Coordination of Care

Coordinated care is required when patient’s care needs are complicated such that there is requirement multiple ongoing assessments, planning and intervention from a variety of clinical specialists. The provision of care from multiple providers require to be coordinated to ensure delivery of effective and efficient quality care.

Coordinated care is a systemic approach to providing effective care and support to patients with chronic conditions. When coordinated care is implemented, patients (and their families where necessary and appropriate) are managed/cared for and supported across the health-wellness continuum. The resulting care and management are effective, efficient, high quality, accessible, and produce optimal health outcomes.

### 4.2 Coordination of Care Models

Many models are possible.

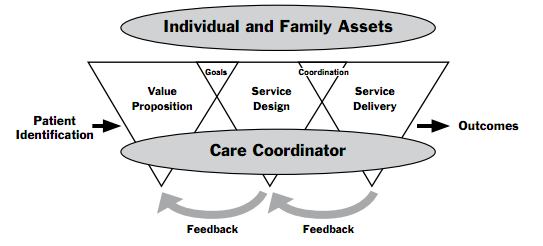


Figure x. Institute of Health Improvement Coordination Model for people with multiple health and social needs (Craig C, Eby D, Whittington J, 2011, Care Coordination Model: Better care at lower cost for people with multiple health and social needs. Innovation Series 2011. Institute for Healthcare Improvement)

(<http://www.healthtransformation.ohio.gov/LinkClick.aspx?fileticket=hvvmeMjFl-E%3D&tabid=70>)

5. General Comments on this Storyboard

This section captures general comments about this storyboard or care plan exchange of data. Specific comments on contents are integrated at the appropriate places in the SB.

6. Appendices

6.1 Appendix A.- Definitions (Glossary)

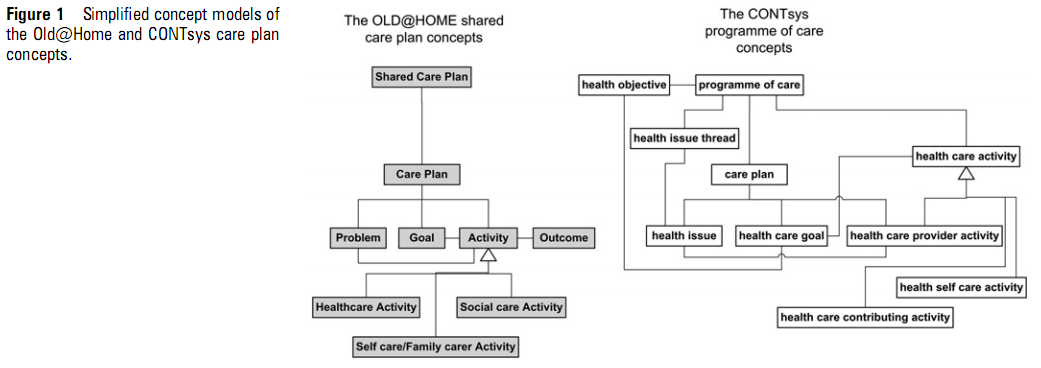
| **Term/Concept** | **Definition** | **Notes** | **Source/ref.** |
| --- | --- | --- | --- |
| Care plan | statement, based on needs assessment, of planned health care activities in a health care process. care plan will be reviewed repeatedly during a health care process, each review based on a new needs assessment. |  | ISO/TC215-ISO 13940- System of concepts to support continuity of care-ContSys-Committee Draft- Nov. 2011 |
| Clinical guideline | set of systematically developed statements to assist the decisions made by health care actors about health care activities to be performed with regard to health issues in specified clinical circumstances |  | ISO 13940 CD |
| Clinical pathway | Structured pattern for a health care workflow to be used in standardised care plans for subjects of  care having similar health conditions with a predictable clinical cours |  | ISO 13940 CD |
| Encounter (contact) | Patient encounter is defined as an interaction between a patient and one or more healthcare practitioners for the purpose of providing patient services or assessing the health status of the patient. (HL7)  Event during which subject of care interacts, directly or indirectly, with one or more health care professionals (ISO, ‘contact’) |  | HL7 Version 3 Standard: Patient Administration Release 2; Patient Encounter, Release 1 DSTU Ballot 1 - May 2011  ISO 13940 CD |
| Feedback | The return of information about the result of a process or activity. |  | Dictionary.com |
| Health issue | Issue related to the health of a subject of care, as identified and labelled by a specific health care actor |  | ISO 13940 CD |
| Health issue thread | Defined association between health issues and/or health issue treads, as decided and labelled by one or several health care actors. A health issue thread inherently associates the health care and clinical processes as well as the health care activity period elements referring to those health issues. |  | ISO 13940 CD |
| Health objective | Desired ultimate achievement of the health care activities in a care plan. A health objective could be expressed as one or several target conditions |  | ISO 13940 CD |
| Outcome | something that follows from an action, dispute, situation, etc; result; consequence |  | Dictionary.com. Collins English Dictionary |
| Protocol | clinical guidelines and/or clinical pathways customised for operational use. A protocol is more precise than a clinical guideline. However it does no more concern any subject of care in particular than a clinical guideline. |  | ISO 13940 CD |
| Target Condition | possible health condition representing health objectives and/or health care goals |  | ISO 13940 CD |

6.2 Appendix B.- Description of Information Created and Exchanged

| **ID No.** | **Brief Description of Information** | **Contents example** | **Source/ref.** |
| --- | --- | --- | --- |
| Exchange-1 | Referral requests to:   * Diabetic educator * Dietitian * Exercise physiology * Clinical psychologist * Optometrist * Podiatrist | Problems/diagnoses  Reason(s) for referral  Services requested |  |
| Exchange-2 | Integrated care plan attached to referral requests to:   * Diabetic educator * Dietitian * Exercise physiology * Clinical psychologist * Optometrist * Podiatrist | Diagnosis  Problems/needs  Goals  Interventions  Responsible providers  Review plan + schedule |  |
| Exchange-3 | Allied health domain specific progress note to primary care provider | Patient clinical status and progress  Recommendations to primary care provider  New care coordination responsibilities |  |
| Exchange-4 | Allied health domain specific progress note to other relevant allied health provider(s)  [e.g.: dietitian progress note to diabetic educator with recommendation to review and modify education plan] | Patient clinical status and progress  Recommendations to other allied health provider |  |
| Exchange-5 | Hospital discharge summary to primary care provider | Problems/diagnosis  Discharge medications  Ceased medications  Procedures & interventions  Diagnostic test requested and results  Services requested |  |
| Exchange-6 | Discharge care plan | Diagnosis  Problems/needs  Goals  Interventions  Responsible providers  Follow-ups  Review plan + schedule |  |
| Exchange-7 | Prescription to community pharmacist | New medications |  |
| Exchange-8 | Progress notes from primary care provider to dietitian and exercise physiologist | Patient clinical status and progress  New problems/needs  Recommendations to dietitian and exercise physiologist  New care coordination responsibilities |  |
| Exchange-9 | Updated integrated care plan from primary care provider to relevant allied health provider (e.g. dietitian, exercise physiologist, etc) | Diagnosis  Existing + new problems/needs  Revised goals  Interventions  Responsible providers  Any follow-up plan  Review plan + schedule |  |
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6.3 Appendix C.- References

1. HL7 Healthcare Development Framework Version 1.5 Release 1; Modeling and Methodology Work Group, November 21st , 2009, section 3, pages 34 to 53
2. Modeling shared care plans using CONTsys and openEHR to support shared homecare of the elderly, by Maria Hagglund, Rong Chen, Sabine Koch; Karolinska Institutet, Stockholm, Sweden; J Am Med Inform Assoc 2011;18:66e69. doi:10.1136/jamia.2009.000216; jamia.bmj.com. See summary models below.



Appendix D.- History of SB Validation Process

|  |  |  |  |
| --- | --- | --- | --- |
| **Date/Period** | **Activity** | **Participants** | **Outcome** |
| June to Sept. 2011 | Draft and reviews | HL7 Care Plan meeting participants | Major updates to SB |
| Nov. 18, 2011 | Final update of Appendices 1 and 2 | André Boudreau | SB ready for review by clinicians |
| 2011-12-21 | Review in Care Plan Meeting of the PC WG. | See minutes | Update to SB. Still need to add short description of information exchanged. |
|  |  |  |  |
|  |  |  |  |

1. Frequency of visits examples:

   * Diabetic educator, exercise physiologist, and dietitian: up to 5 times per calendar year (Australia Medical Benefit Schedule)
   * Optician/ophthalmologist: NHS (UK) every 12 months; Australia (Medical & Health Research Council recommendation) every 24 months or earlier
   * GP/podiatrist: every visit if neuropathy exists; 6 monthly if one or more of risk factors exist (sensory change, circulation change, history of ulcer, foot deformity); at least every 12 months for low risk cases
   * Pharmacist: for each medication dispense

   [↑](#footnote-ref-1)