

Care Plan Storyboard

Type II Diabetes Mellitus

Objectives:

The purpose of this care plan storyboard for chronic conditions is to illustrate the clinical documentation by care providers, and communication flow between a patient and care team members involved in his/her long term care. The chronic condition selected for this storyboard is Type II Diabetes Mellitus (Type II DM).

This storyboard is not written for a specific interoperability standard, but it is intended to support clinical and technical interoperability testing at both the HL7 FHIR Connectathon and HL7 C-CDA Implementation-a-thon events.

- FHIR CarePlan, http://wiki.hl7.org/index.php?title=201701_Care_Plan
- C-CDA <http://www.hl7.org/events/c-cda/implementation/2017/01/>

The storyboard is intended to describe a realistic clinical flow with data capture requirements, but it is intentionally simplified so that the scenario scope may be covered during one testing event. Future storyboard updates are planned to include additional clinical events during the patient's long-term care and coordination between multiple care provider organizations. This storyboard begins with the patient's initial diagnosis of Type II DM and creation of a new care plan by the primary care physician (PCP). It includes referrals for specialist consultation with a dietician and a podiatrist. An optional complexity is to allow for separate care plans to be created by these specialists within their respective organizations (different from the PCP's organization), and for the primary care plan to reference these additional plans using the CarePlan.relatedPlan element in FHIR. Thus, a complete scenario includes three separate care plans that are stored and updated on three separate organization EHR systems (three FHIR servers during the test event).

An additional desirable capability is to enable care team members to subscribe for notification of changes to the other related care plans, e.g. for the PCP to be notified of changes to planned interventions by the podiatrist, or for the dietician to be notified of changes to prescribed medications by the PCP. A complete analysis and reconciliation of the three (or more) care plans for this patient, and coordination of all planned interventions and activities across organizations, is out of scope for this test scenario and likely delegated to a clinical decision support system.

Primary Actor:

Patient's Primary Care Physician (PCP) – Dr Patricia Primary

Other Actors:

Patient – Mr Bob Anyman

Diabetic nurse educator – Ms Leanne Wells

Dietitian – Ms Nutrish Foods

Pharmacist – Mr Heath Pills

Podiatrist – Mr Nat Foote

Exercise physiologist – Mr Active Works

Related Person – Patient's daughter, caregiver

Assumptions:

All actors have access to electronic systems/applications for documenting and exchanging health information

Precondition:

Patient Mr. Bob Anyman attends his primary care physician (PCP) clinic because he has been feeling generally unwell in the past 18 months. His recent blood test results reveal abnormal Hemoglobin A1C

- Mr. Bob Anyman, birthdate: 1954-09-17

Trigger(s):

Mr Bob Anyman presents at his PCP clinic for review of his complaints and his HbA1c

Flow of Events:

1. Dr. Patricia Primary reviews Mr. Anyman's presenting complaints, the fasting blood glucose, and HbA1c test results. She concludes that the patient suffers from Type II Diabetes Mellitus (Type II DM) (SCTID: 44054006).
2. Documentation in EMR:
 - Chief complaints = general fatigue; constant thirst; frequent urination including awakening during the night; cold feet with decreased sensation in his feet
 - Fasting blood glucose = 163 mg/dl.
 - HbA1c 7.8 %
 - Diagnosis = Type II DM
3. Dr Primary also reviews the patient's medical history and identifies that he also has previously diagnosed problems:
 - Hypercholesterolemia (SCTID: 13644009)
 - Hypertension (SCTID: 38341003)
4. The medication management record reveals that the patient is quite often non-compliant in taking his anti-hypertensive and cholesterol lowering medications
5. Dr Primary performed a physical measurement assessment. The results indicate that Mr Anyman is also overweight:
 - Height = 67 inches
 - Weight = 216 lbs
 - Blood Pressure 164/108 mm Hg with automated cuff, right arm, sitting
 - BMI = 33 (30+ = obese)
6. Dr Primary discusses with the patient the potential serious health risks (cardiovascular and neurovascular).
The patient agrees to have a DM care plan drawn up to include the following:

- **Health Concern 1** = inability to maintain effective blood glucose control
Goal 1 = achieve blood glucose control – aiming at fasting blood glucose level below 108 mg/dl; HbA1c below 7%
Interventions:
 - Medication = metformin extended release: begins with 1000mg taken with evening meal (and reviewed weekly for dose titration to no more than 2500mg/day) [Mayo clinic protocol]

- Exercise: refer to exercise physiologist to develop a weight reduction plan optimised for glucose control
- Diet: refer to nutritionist to develop a nutrition plan optimised for blood glucose control and weight reduction
- **Health Concern 2 = obesity**
Goal 2 = conformance to optimise diabetic diet, in conjunction with exercise plan, to achieve weight reduction of 0.5% body weight per week to 175lb (BMI 25)
Interventions:
 - Referral to dietitian for Type II DM diet plan
 - Diet care plan to include goals and interventions:
 - Controlled carbohydrate, high fiber (30 grams per day), low saturated fat, low sodium (less than 2000 mg per day)
- **Health Concern 3 = peripheral vascular and neuropathy risks leading to heightened foot complication risks**
Goal 3 = improve and maintenance of optimal foot health: aim at early detection of peripheral vascular problems and neuropathy presumed due to diabetes; and prevention of diabetic foot ulcer, gangrene
Interventions:
 - Referral to podiatrist for diabetic foot care plan.
 - Podiatry care plan to include goals and interventions:
 - Patient to be educated on and regularly perform foot self-examination, use proper footwear, regular exercises, attend scheduled follow-up
- **Health Concern 4 = provisional diagnosis high blood pressure with past history of borderline high blood pressure**
Goal 4 = maintain blood pressure control with blood pressure readings below 140/90 mm Hg; diagnosis of high blood pressure is established by more than one reading of above 140/90 mm Hg within a 4 week period
Intervention: return visit within 4 weeks for blood pressure check, weight, and fasting blood glucose
- **Health Concern 5 = health literacy deficit which may impact self-care willingness and ability to achieve goals**
Goal 5 = address patient knowledge deficit on diabetic self-care: aim at addressing patient's knowledge deficit, ensure optimal self-care and prevention/minimization of complications
Intervention: refer to diabetic nurse educator to assess level of knowledge deficit and implement a diabetic patient education plan. Patient to be educated on his conditions – Type 2 DM and the extrinsic (additional) health risks that DM can impact on and hypertension; the importance of glycaemic control, diet control, weight loss, foot care, eye care; prevention and emergency care of hyperglycaemic and hypoglycaemic episodes, etc.

Post-Condition(s):

1. PCP EMR updated with
 - blood glucose results: fasting blood glucose and glucose tolerance test results
 - patient's chief complaints
 - new diagnosis: Type II diabetes mellitus
2. A prescription for metformin is submitted for the patient

3. Type II DM Care Plan created that includes:
 - Health concerns and diagnosed problems
 - Health goals to mitigate/manage identified health concerns and problems
 - Interventions/care activities to achieve set health goals
4. A copy of care plan is generated for the patient including relevant instructions
5. Referral request for Dietician consultation:
 - Based on: Type II DM care plan
 - Reason: Type II DM (SCTID: 44054006)
 - Specialty: Dietician (SCTID: 159033005)
 - Service requested: code(s)?
 - Description: effective management/implementation of diet plan, exercise regime
6. Referral request for Podiatrist consultation:
 - Based on: Type II DM care plan
 - Reason: Type II DM (SCTID: 44054006)
 - Specialty: Podiatrist (SCTID: 159034004)
 - Service requested: code(s)?
 - Description: foot care, patient education