

Diabetes Management and Remote Monitoring with FHIR

Storyboard: AML Management and Research using FHIR

Title: "Priya's Battle: Navigating AML Treatment with FHIR"

Characters:

- Priya Sharma: 28-year-old graphic designer diagnosed with Acute Myeloid Leukemia (AML)
- Dr. Aditya Kapoor: Hematologist-Oncologist
- Nurse Meera Patel: Oncology Nurse Specialist
- Dr. Ravi Kumar: Genetic Specialist
- OncoCare: A FHIR-compliant oncology management system
- Scene 1: Diagnosis and Initial Assessment
 - 1. Priya visits Dr. Kapoor after experiencing persistent fatigue, easy bruising, and frequent infections.
 - 2. Dr. Kapoor orders blood tests and a bone marrow biopsy, which confirm AML diagnosis.
 - 3. He creates an initial assessment in OncoCare, including diagnosis, lab results, and preliminary treatment plan.
 - **4. FHIR Resources: Patient, Condition, Observation, DiagnosticReport, CarePlan**
- Scene 2: Genetic Profiling and Treatment Planning
 - 1. Dr. Kumar performs genetic testing to identify AML subtype and potential targeted therapies.
 - 2. Results show a FLT3-ITD mutation, indicating a more aggressive form of AML.
 - 3. Dr. Kumar updates Priya's genetic profile in OncoCare using FHIR-compliant genomic resources.
 - 4. Dr. Kapoor receives an alert about the genetic results and adjusts the treatment plan accordingly.
 - **5. FHIR Resources: Specimen, MolecularSequence, GeneticVariant (custom resource), CarePlan**
- Scene 3: Induction Chemotherapy
 - 1. Priya is admitted to the hospital for intensive induction chemotherapy.

- 2. Nurse Meera uses OncoCare to record medication administration, vital signs, and side effects.
 - 3. OncoCare integrates with hospital systems to automatically update lab results and imaging studies.
 - 4. **FHIR Resources: Encounter, MedicationAdministration, Observation, DiagnosticReport**
- Scene 4: Remote Monitoring and Complication Management
 - 1. After discharge, Priya uses the OncoCare mobile app to log symptoms and side effects daily.
 - 2. The app alerts her care team when certain thresholds are exceeded (e.g., high fever).
 - 3. Dr. Kapoor conducts a virtual consultation when Priya reports severe mucositis.
 - 4. **FHIR Resources: Observation, QuestionnaireResponse, Encounter, ClinicalImpression**
- Scene 5: Multidisciplinary Tumor Board
 - 1. OncoCare facilitates a virtual tumour board meeting to discuss Priya's case.
 - 2. Specialists from different departments review Priya's comprehensive data through OncoCare.
 - 3. They collaboratively decide on the next phase of treatment, which is documented in the system.
 - 4. **FHIR Resources: CareTeam, CarePlan, Communication, Goal**
- Scene 6: Clinical Trial Enrollment
 - 1. Based on Priya's genetic profile, OncoCare identifies a suitable clinical trial for FLT3 inhibitors.
 - 2. Dr. Kapoor discusses the trial option with Priya during a follow-up appointment.
 - 3. Priya consents to participate and securely shares her relevant data with researchers.
 - 4. **FHIR Resources: ResearchStudy, ResearchSubject, Consent**
- Scene 7: Continuous Treatment Monitoring
 - 1. Priya begins the clinical trial treatment in combination with standard therapy.
 - 2. OncoCare integrates data from the trial protocol with Priya's ongoing care plan.
 - 3. Researchers access anonymised trial data through FHIR APIs for real-time analysis.
 - 4. **FHIR Resources: MedicationAdministration, Observation, Group, MeasureReport**
- Scene 8: Managing Treatment-Related Complications
 - 1. Priya develops neutropenic sepsis and is rushed to the emergency department.

- 2. ED doctors instantly access Priya's complete medical history through OncoCare's FHIR-based interoperability.
- 3. They initiate appropriate treatment based on Priya's specific condition and ongoing therapies.
- 4. **FHIR Resources: Encounter, Condition, MedicationRequest, Procedure**
- Scene 9: Bone Marrow Transplant Evaluation
 - 1. Post-induction therapy, OncoCare prompts Dr. Kapoor to evaluate Priya for bone marrow transplantation.
 - 2. The system facilitates HLA typing and potential donor matching through integration with national registries.
 - 3. Dr. Kapoor uses OncoCare to refer Priya to a transplant centre, securely sharing her entire case history.
 - 4. **FHIR Resources: ServiceRequest, ReferralRequest, DocumentReference**
- Scene 10: Long-term Follow-up and Survivorship
 - 1. After successful treatment, Priya transitions to long-term follow-up care.
 - 2. OncoCare generates a comprehensive survivorship care plan, including monitoring for late effects of treatment.
 - 3. The system collects long-term outcome data, contributing to AML research and improving future care.
 - 4. **FHIR Resources: CarePlan, Observation, ResearchSubject, MeasureReport**

This storyboard demonstrates how FHIR can be used to create an integrated, patient-centered approach to managing complex conditions like AML. It showcases using various FHIR resources for individual patient care, from diagnosis to treatment and long-term follow-up. The OncoCare system is an example of how FHIR standards can enable seamless data exchange between patients, healthcare providers, researchers, and even clinical trial systems, ultimately leading to improved health outcomes and advancements in medical knowledge.

Data Model: AML Management with FHIR

Entity	FHIR Resource	Description
Patient	Patient	Priya's demographic information
Diagnosis	Condition	Priya's AML diagnosis
Genetic Test	MolecularSequence, GeneticVariant	Priya's FLT3-ITD mutation results

Lab Results	Observation, DiagnosticReport	Blood tests, bone marrow biopsy, HLA typing
Chemotherapy	MedicationAdministration, Encounter	Tracks chemotherapy treatment
Treatment Plan	CarePlan	Priya's complete treatment and survivorship plan
Telehealth	Encounter, ClinicalImpression, QuestionnaireResponse	Priya's remote monitoring and consultations
Clinical Trial	ResearchStudy, ResearchSubject, Consent	Priya's enrollment in clinical research trials
Tumor Board	CareTeam, Communication	Multidisciplinary collaboration on Priya's treatment plan.
Transplant	ReferralRequest, ServiceRequest	Referral and HLA matching for bone marrow transplant
Long-term Care	Observation, MeasureReport	We monitor Priya's long-term outcomes and contribute anonymised data to AML research studies.

