emNutt and mHero

HL7® FHIR® Applications Roundtable
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Mobile Alert Communication Management (mACM)

- From Integrating the Healthcare Enterprise® (IHE) IT Infrastructure
- Currently in Trial Implementation
- Provides the infrastructural components needed to send short, unstructured text alerts to human recipients and can record the outcomes of any human interactions upon receipt of the alert.
- Allows for a feedback mechanism to determine the status of an alert.
emNutt

Named after Emma Nutt, the world’s first female telephone switchboard operator

- Open source component of mHero to send messages from any eHealth or mHealth applications to a health worker or client
- Implements the mACM profile
- Written in Node.js.
emNutt is a FHIR HTTP server accepting the Create operation on CommunicationRequest resources.

The alert will be sent and a Communication resource will be created for each alert sent linked to the CommunicationRequest.

Responses are saved as Communication resources linked to the original CommunicationRequest.

Read requests can be accessed for the CommunicationRequest and Communication resources to get status or updates.
Alert Condition

- High Blood Pressure Condition, so send alert to the patient’s doctor.
- Look up **Practitioner** resource to get the contact information to send an SMS.
- Practitioner visits patient and responds to SMS.
- Administrators want to get update on the alert.
mHero Overview

- Supports **two-way communication** with health workers through **mobile phones**
- **Use cases** and **workflows** developed and implemented by the Ministry of Health
- Part of the **Health Information Systems infrastructure** for Ministries of Health
- Features **interoperability** of different health information systems
  - iHRIS – source of health worker data
  - OpenHIE – rules of the road
  - RapidPro – handles SMS
MOH determines use case and sends SMS to Health Workers.

Health Workers continue to respond to the MOH.

MOH uses the information received to make a decision and then continues communication with the Health Worker.

Health Workers respond to the MOH.
What Is mHero?

What is your stock level of PPE?

2 PPE available

Could you confirm that you are an RN?

Yes, I am an RN

What kind of disease agent causes Ebola?

1) Bacteria
2) Virus
3) Toxin
4) Parasite

2) Virus
mHero Workflow

- Select Cohort of health workers (FHIR Practitioner Search)
- Return Cohort of health workers with local identifiers for health workers (FHIR Bundle of Practitioners)
- Request list of available data collection workflows (FHIR Questionnaire Search)
- Return list of data collection workflows (FHIR Bundle of Questionnaires)
- Initiate data collection workflow on cohort of health workers using local identifiers for health workers in Data Collector system (extended operation on FHIR Questionnaire)
- Return data collected
- Collect responses using Questionnaire ID or local identifier of health worker in Data Collector System (FHIR QuestionnaireResponse Search)
- Return QuestionnaireResponse in FHIR Bundle