

# Job Aid Smart Apps for Community Health Workers

Designing Technology for  
Resource-Constrained Environments  
April 25, 2012


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# Project overview

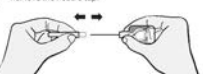
**Using Oxytocin in the Uniject™ Injection System (10 IU in 1 ml)**


- Check the time-temperature indicator and confirm the oxytocin look to use. If not, discard and get a new Uniject containing oxytocin.



- Open the foil pouch and remove the Uniject.



- Activate the Uniject.


  - Hold the Uniject by the port with the forefinger and thumb.
  - With a firm, rapid movement push the needle shield into the port.
  - Continue to push firmly until the gap between the needle shield and port is closed.
- Remove the needle cap.


- Continue to hold the Uniject by the port and insert the needle into the patient.


- Squeeze the reservoir firmly to inject the oxytocin. After the reservoir completely collapses, remove the Uniject.

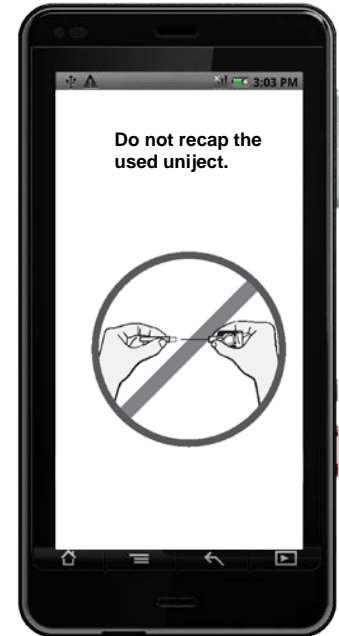
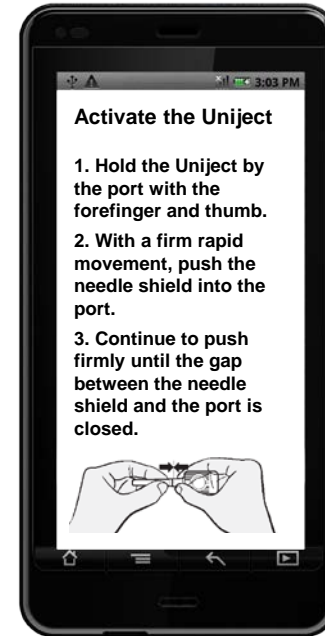

- Do not re-cap the used Uniject.


- Discard the used Uniject according to established medical waste disposal procedures.



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# Field work and initial prototypes

## Work last quarter

- Interviews and rapid usability testing with 10 public health professionals.
- Two app prototypes built using ODK.

## Important app elements

- Overview of steps before beginning
- Clear wayfinding—"next" button in addition to swipe
- Calculators
- Timers
- Animated images or videos
- Decision trees

## Paper job aids are still important

- Still important to have paper as back up.
- Some job aids are just as good (or better) in paper format.

## Usability

- Smart apps may be challenging to use for some people and/or in certain contexts.



# Implementation plan overview

## Key goals

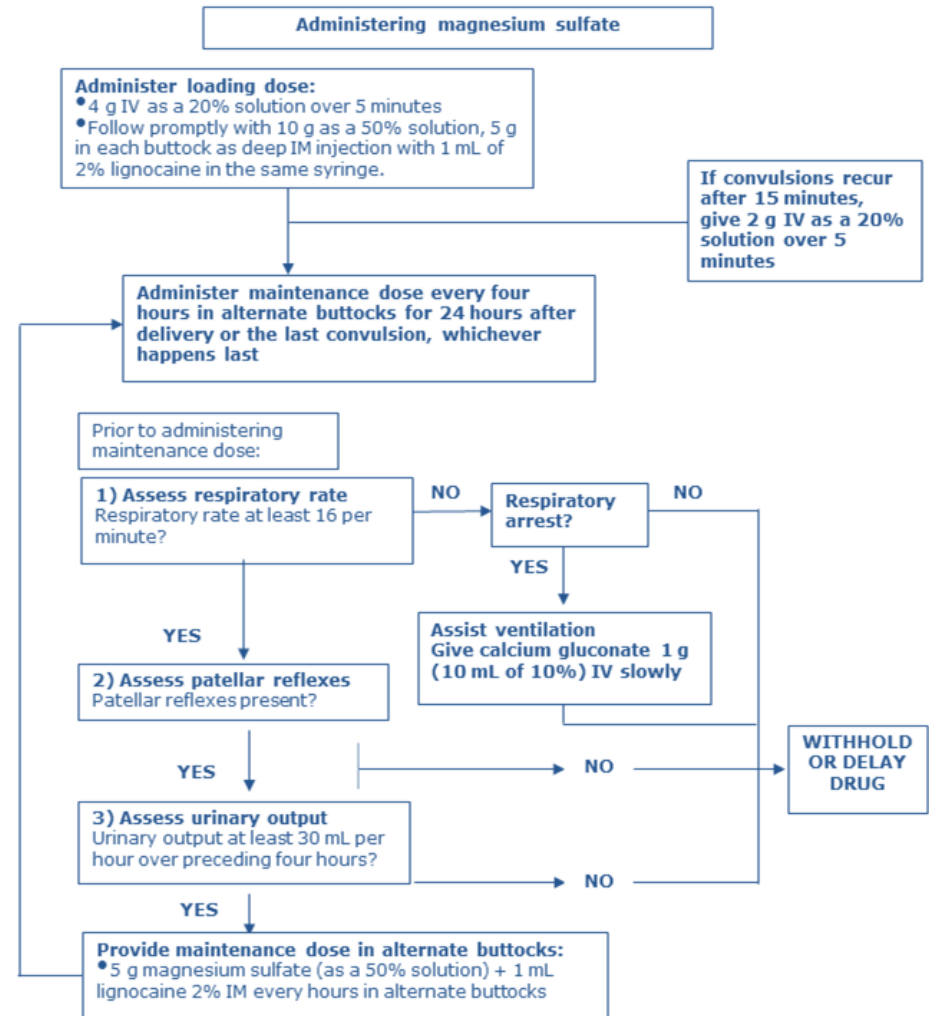
- Develop at least 2 job aid smart apps.
- Focus on key widgets: calculators, timers.
- Refine decision tree functionality.

## Approach/architecture

- Android app loads job aids dynamically as mini web sites.
- WebView to display HTML, control flow in XML (in progress).
- Next steps: integration with "smart" widgets using Android Activity/Intent mechanism.

## Change of plans

- We've decided that the app builder is too ambitious for this quarter, but we are keeping it in mind for future work.



# What we've accomplished so far

## Work so far

- Malaria rapid diagnostic test job aid initial draft prototype developed.
- Magnesium sulfate job aid in progress.
- Widgets in progress:
  - Magnesium sulfate dosage calculator
  - Timer

## Work to do

- Branching work—decision trees.
- Integrating animated images or videos.

## Interesting possibility


- Potential to integrate Nicki's work on optical recognition of rapid diagnostic test results.

### How To Do the Rapid Test for Malaria

Modified for training in the use of the **Generic Pf Test** for *falciparum* malaria

Collect:

- a. **NEW unopened** test packet
- b. **NEW unopened** alcohol swab
- c. **NEW unopened** lancet
- d. **NEW pair** of disposable gloves
- e. Buffer
- f. Timer



**1. READ THESE INSTRUCTIONS CAREFULLY BEFORE YOU BEGIN.**

1. Check the expiry date on the test packet.
2. Put on the gloves. Use new gloves for each patient.
3. Open the packet and remove:
  - a. Test
  - b. Capillary tube
  - c. Discard swab
4. Write the patient's name on the test.

**5. Open the alcohol swab.** Grasp the "d" finger on the patient's left hand. Clean the finger with the alcohol swab. Allow the finger to dry before pricking.

**6. Open the lancet.** Pick patient's finger to get a drop of blood.

**7. Discard the lancet** in the Sharps Box immediately after pricking finger. **Do not set the lancet down before discarding it.**

**8. Use the capillary tube** to collect the drop of blood.

**9. Use the capillary tube** to put the drop of blood into the square hole marked "A".

**10. Discard the capillary tube** in the Sharps Box.

**11. Add buffer** into the round hole marked "B".

**12. Wait 15 minutes** after adding buffer.

**13. Read test results.** **NOTE: Do Not** read the test sooner than 15 minutes after adding the buffer. You may get **FALSE** results.

**14. How to read the test results:**

**POSITIVE**  
A line near letter "C" and a line near letter "T" means the patient is **POSITIVE** for malaria.


**NEGATIVE**  
A line near letter "C" and **NO LINE** near letter "T" means the patient **DOES NOT** have malaria.

**INVALID RESULT**  
**NO LINE** near letter "C" and one or no line near letter "T" means the test is **INVALID**.

**NOTE: Each test can be used ONLY ONE TIME.**  
Do not try to use the test more than once.

**15. Dispose** of the gloves, alcohol swab, discard swab and packaging in a non-sharps waste container.

**16. Record** the test results in your CRM register. Dispose of contents in non-sharps waste container.



# Malaria rapid diagnostic test

JobAids

## How to do the Rapid Test for Malaria

Modified for training in the use of the Generic Pf Test for falciparum malaria



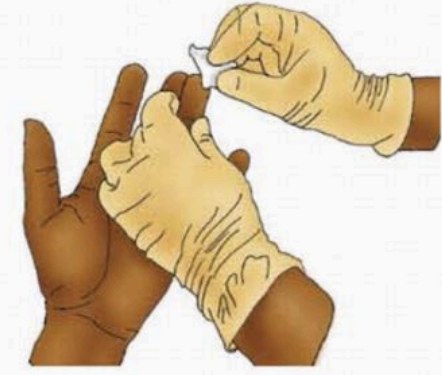
An illustration of a smiling woman with dark hair, wearing a patterned top, holding a small white and blue box labeled 'MALARIA Rapid Diagnostic Test'. The box also has 'PfPR2-10' written on it.

Back Next

JobAids

### Step 5 of 16

Open the alcohol swab. Grasp the 4th finger on the patient's left hand. Clean the finger with the alcohol swab. Allow the finger to dry before pricking.



An illustration showing a person wearing a yellow glove cleaning the fourth finger of another person's left hand with a white alcohol swab. The patient's hand is also wearing a yellow glove.

Back Next

# Eclampsia prevention using magnesium sulfate

**LOADING DOSE - IV** ⓘ ?

Screen 1/6

What is the % concentration of MgSO<sub>4</sub> available?

20%

50%

50%

Other

**BACK** **NEXT**

**LOADING DOSE - IV** ⓘ ?

Screen 2/6

What is the **final** % concentration of MgSO<sub>4</sub> required?

20%

50%

50%

Other

**BACK** **NEXT**

**LOADING DOSE - IV** ⓘ ?

Screen 3/6 Final Solution: 4 gm 20% IV

**NOTE:** The IV solution injection should be given slowly for 5 minutes.

**Step 1/3:** Extract **XXXX** ml of **YYYYY** ml MGSO<sub>4</sub> solution into a new syringe from the vial.

**Step 2/3:** Add **ZZZZ** ml of sterile water to the syringe.

**Step 3/3:** Give the IV solution slowly for 5 minutes.

**BACK** **NEXT**

**LOADING DOSE - IV** ⓘ ?

Screen 4/6

**NOTE:** You should have IM solution available with concentration AT LEAST 50% to prepare an IM Solution. If not available, 1gm of 20% IV solution should be given as an injection to the patient.

Does the **available** IM Solution have a concentration **greater than or equal** to 50%?

**YES**

**NO**

**BACK** **NEXT**

# Evaluation plan

## How will we ensure that our solution solves the problem?

- User testing of app functionality in general.
- Comparison of paper job aids with apps—user preferences.

## What criteria will you measure?

- Understanding the procedure overview before beginning.
- Ability to navigate while conducting the procedure (e.g., holding smart phone and syringe at the same time).
- Ability to complete complex tasks: calculations, reading test results.

## Target users for the first build

- Health professionals in Seattle/King County area.

## User testing dates

- Week 7

## Target users for final build

- Eclampsia prevention app: community health workers.
- Malaria rapid diagnostic test app: community health workers in malarial regions (e.g., African countries) and Peru.





# What's left to do?

## Components/capabilities not yet implemented

- How to localize the app easily (e.g., language settings).
- Setting up workflows that can eventually be scaled up to an app builder.

## Anticipated problems?

- Availability of smart phones and maintaining the built application?
- Is this a worthwhile replacement/supplement with paper based job aids?

## Remaining unknowns

- Usability issues that we haven't thought of yet:
  - For example, smart apps not ideal for older community health workers who are unfamiliar with a smart phone interface.
- How could this intervention play a role in health worker training?
- When and how could apps be feasible and cost-effective in global public health systems?

## How we will address completing missing elements and mitigating risk?

- User testing, pilot feedback sessions, and interviews.

# Timeline for remainder of quarter

## Weeks 1-5:

- Finalize at least 2 job aid smart apps.
- Key widgets:
  - Magnesium sulfate dosage calculator.
  - Malaria rapid diagnostic test timer.
- Refine decision tree functionality.

## Week 6:

- Job aids and widgets developed and ready for user testing.

## Week 7:

- Conduct user testing of job aid smart apps (widgets).

## Weeks 8-9:

- Refine based on user feedback.

## Week 10:

- Have final prototypes complete.



**Thanks!**  
**Questions?**

