Job Aid
Smart Apps
for Community Health Workers

Change seminar
May 24, 2012

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Project overview: paper to app
Field work

Winter quarter work

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

Important app capabilities

- Clear wayfinding—"next" button and swipe
- Decision trees
- Calculators
- Timers
- Animated images or videos

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

- Apps may be challenging for some users.
Implementation

Key goals
- Develop three job aid smart apps.
- Focus on key widgets:
  - Calculators, timers, decision trees.
- Refine decision tree functionality.

Architecture
- Rapid diagnostic test apps:
  - Web apps using jQuery Mobile.
  - Deployed as Android app using PhoneGap
- Eclampsia prevention app:
  - Native Android app

Future work
- App builder for non-programmers (templating system).
- Integrate Nicki’s optical recognition of rapid diagnostic test results.
Job aid apps built so far

**Job aid apps**
- Malaria rapid diagnostic test
- HIV rapid diagnostic test
- Eclampsia prevention/treatment

**Key widgets**
- Dosage calculator
- Timers
- Decision trees
Malaria rapid diagnostic test

How To Do the Rapid Test for Malaria

Modified for training in the use of the Generic PI Test for Plasmodium malariae

Collect:
- NEW unopened test packet
- NEW unopened cloth tests
- NEW unopened in-cast
- New pair of disposable gloves
- Buffer
- Force

1. Open the test packet carefully before using.
2. Put on the gloves, the new gloves for each packet.
3. Open the test packet and remove the test.
4. Write the patient's name on the test.
5. Open the cloth packet. Gather the cloth packets on the patient's left hand. Allow the fingers to be dry before picking.
6. Open the cloth. Pick up the test tube to get a drop of malarial blood. After picking, wipe the inside of the test tube with a cloth before opening.
7. Dip the cloth into the sample tube to collect the drop of blood.
8. Dip the cloth into the sample tube for 30 seconds.
9. Dip the cloth into the sample tube for another 30 seconds.
10. Dip the sample into the sample tube to collect the drop of blood.
11. Drop the sample into the sample tube for 30 seconds.
12. Wait 10 minutes after adding the buffer.

13. Check the test results:
   - Positive:
     - A line next to “C” and next to “T” means the patient is PIS5504V, POG.
     - A line next to “C” means the patient is PIS5504V, POG.
   - Negative:
     - A line next to “C” and NO LINE next to “T” means the patient does not have malaria.
     - A line next to “C” means the patient does not have malaria.
   - Invalid Result:
     - NO LINE next to “C” and line or no line on second line means the test is INANCED.

NOTE: Each test can only be used ONCE. Do not try to use the test more than once.
OraQuick HIV rapid diagnostic test

**OraQuick HIV Rapid Test**
For use with oral fluids
Store Kits: 2 - 30 °C

- Check kit before use. Use only items that have not expired or been damaged.
- Bring kit and previously stored specimens to room temperature prior to use.
- Always use universal safety precautions when handling specimens. Keep work areas clean and organized.

This outline is not intended to replace the product insert or your standard operating procedure (SOP).

1. Collect test items and other necessary lab supplies.
2. Set reusable stand on a flat, level surface. Partially remove device from package and label device and developer vial with client identification number.
3. Carefully uncap the developer vial and place vial into the stand.
4. Instruct the client to use the pod end of the test device to swab completely across the outside of the upper and lower gums, one time around.
5. Insert the device pod completely into the vial with the result window facing forward.
6. Wait 20 minutes (no longer than 40 min.) before reading the results.
7. Read and record the results and other pertinent info on the worksheet.

**OraQuick HIV Rapid Test Results**

- **Reactive**: 2 lines of any intensity appear in both the control and test areas.
- **Non-reactive**: 1 line appears in the control area and no line in the test area.
- **Invalid**: No line appears in the control area. Do not report invalid results. Repeat test with a new test device even if a line appears in the test area.

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Use of trade names and commercial sources is for identification only and does not imply endorsement by WHO, the Public Health Service, or by the U.S. Department of Health and Human Services (2006).

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**OraQuick HIV Rapid Test**
For use with whole blood, serum or plasma
Store Kits: 2 - 30 °C

- Check kit before use. Use only items that have not expired or been damaged.
- Bring kit and previously stored specimens to room temperature prior to use.
- Always use universal safety precautions when handling specimens. Keep work areas clean and organized.

This outline is not intended to replace the product insert or your standard operating procedure (SOP).

1. Collect test items and other necessary lab supplies.
2. Set reusable stand on a flat, level surface. Partially remove device from package and label device and developer vial with client identification number.
3. Carefully uncap the developer vial and place vial into the stand.
4. Collect approximately 5 ml of specimen using a new disposable loop.
5. Transfer the collected specimen to the vial.
6. Stir the specimen in the vial with the loop.
7. Insert the device pod completely into the vial with the result window facing forward.
8. Wait 20 minutes (no longer than 40 min.) before reading the results.
9. Read and record the results and other pertinent info on the worksheet.

**OraQuick HIV Rapid Test Results**

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Eclampsia prevention using magnesium sulfate

Administering magnesium sulfate

Administer loading dose:
- 4 g IV as a 20% solution over 5 minutes
- Follow promptly with 10 g as a 50% solution, 5 g in each buttock as deep IM injection with 1 mL of 2% lignocaine in the same syringe.

If convulsions recur after 15 minutes, give 2 g IV as a 20% solution over 5 minutes.

Administer maintenance dose every four hours in alternate buttocks for 24 hours after delivery or the last convulsion, whichever happens last.

Prior to administering maintenance dose:

1) Assess respiratory rate
   Respiratory rate at least 16 per minute?
   YES
   NO

2) Assess patellar reflexes
   Patellar reflexes present?
   YES
   NO

3) Assess urinary output
   Urinary output at least 30 mL per hour over preceding four hours?
   YES
   NO

Provide maintenance dose in alternate buttocks:
- 5 g magnesium sulfate (as a 50% solution) + 1 mL lignocaine 2% IM every hours in alternate buttocks

Assist ventilation
Give calcium gluconate 1 g (10 mL of 10%) IV slowly

Respiratory arrest?
YES
NO

WITHHOLD OR DELAY DRUG
Evaluation

Testing our solution

• User testing of app functionality.
• Comparison of paper job aids with apps—user preferences.

Criteria we are measuring

• Ability to navigate app while conducting procedure.
• Ability to complete complex tasks—calculations and reading test results.
• General usability issues.

Usability test participants

• Users familiar with international and/or health contexts.

Target users for final build

• Community health workers in low-resource settings.
Future work

Work not yet implemented

• Setting timers to run in the background and later notify users.
• How to localize the app easily (e.g., language settings).
• Workflows that can be scaled up to an app builder.

Anticipated problems

• Availability of smart phones.
• Maintaining the built application.
• Determining with *which users* and in *what context* this is worthwhile.

Remaining unknowns

• How could apps play a role in health worker training?
• When and how could apps be feasible and cost-effective in global public health systems?
Thanks!

Questions?