



REUTERS/Lucas Jackson

# HIE Business Solutions



## NYClix / Thomson Reuters mHIE: Value-Driven Collaboration

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Matthew Bates

Jeff Goldstein MD

Jerry Osheroff MD

John Loyack

Patrick Noble



THOMSON REUTERS

# mHIE WORKFLOWS BY TYPE

*These are the three scenario types we are currently testing in the market*

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- **REMOTE CONNECTIVITY:** (scene of accident, other hospital, on-call)
  - EMT uses mobile smart phone device to break-the-glass and retrieve medical information from the HIE to improve quality of care and save lives because of interventions that could possibly be performed in the field.
  - On-Call group practice family practitioner, pediatrician, OB/Gyn, or internist gets a call from a patient. Views patient's chart from their iPhone and figures out what the patient is being treated for and what the overall plan was and may avoid a trip to the ED.
  - Off hours referral set up by on-call physician via iPhone.
  - On Call clinician works up "zebras" from iPhone using the inpatient info plus data from EHR via HIE.



- **CONSULTS ON THE FLY:** (One or both physicians are in transit)
  - On-call doctor and doctor who performed past procedures contacted when patient admitted and worked up in ED. They bring up their patient on their smart phone and view the visit EMR info that is provided through the HIE. Display and discuss problem list with most recent labs from HIE to help diagnosis.
    - i.e.. is this patient's creatinine always this high, or is renal insufficiency a new problem that needs to be worked up?
  - System automatically pulls past data related to an episode of care.
    - i.e.. automatically shows patient's most recent chem 7, CBC, chest radiograph, ECG, and past records of what was ordered during ED evaluation.



- **AUTOMATIC NOTIFICATION:** (Set parameters push alerts)
  - Primary Care Practice alerted when patient admits under certain criteria.
  - Surgeon notified when a patient presents and evaluated by ER post op.
  - Pain doctor gets notified when one of his patients with a pain contract presents to the ED attempting to violate contract.
  - Mother receives alert her daughter is in school infirmary and needs to be picked up.



# mHIE END-TO-END WORKFLOWS

*These are three phases of care we are currently testing in the market*



- I. 1<sup>st</sup> Responders II. ED Team & Specialists III. Primary Care Physicians

1<sup>st</sup> Responders to Scene



Patient admitted & treated by disperse team



Discharged to LTAC



App Store



Work Flows

44

# mHIE END-TO-END WORKFLOWS

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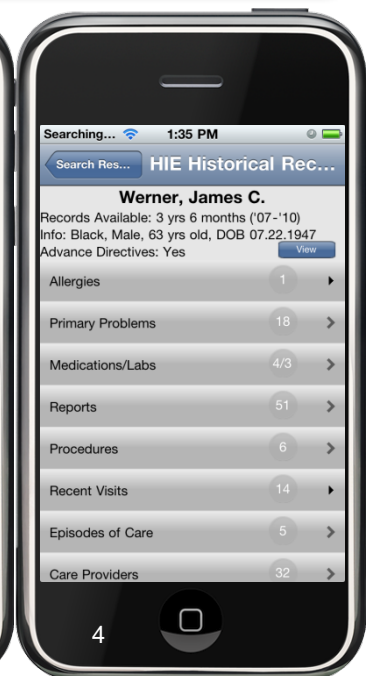
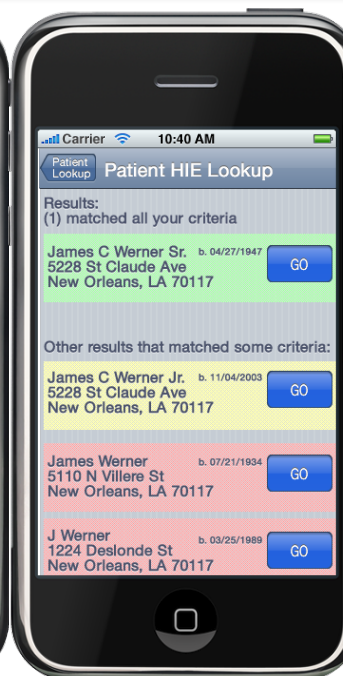


- I. 1<sup>st</sup> Responders: A) Brings up patient's information from HIE on mobile

15 hours into a natural disaster an elderly individual is semi-conscious, dehydrated, and unable to provide first responders any information.

While team is cutting through the roof to extract the patient from the flood waters, the first responder logs into a mobile device app and brings up patient's **medical history from the HIE** by entering patient's name and address which they retrieved from patient's wallet.

The EHR information is available to view on their mobile device via the HIE which is on a back-up database unaffected by the storm lightning and flooding.



# mHIE END-TO-END WORKFLOWS

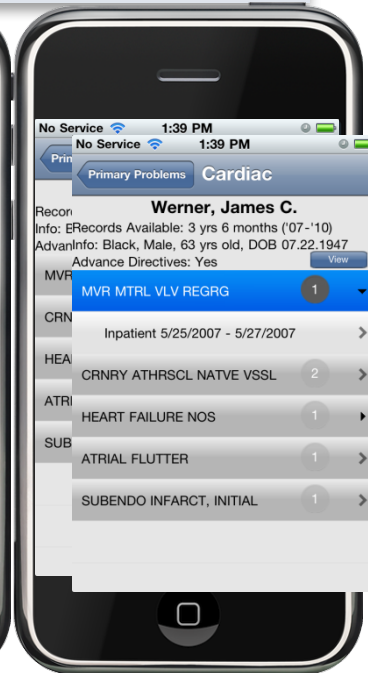
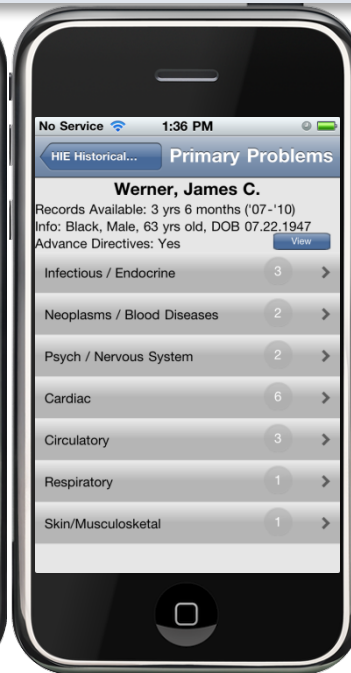
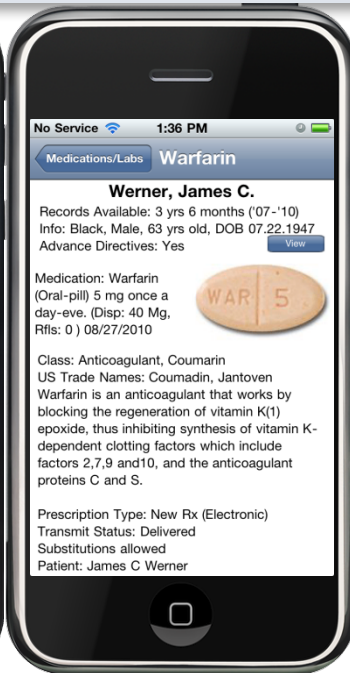
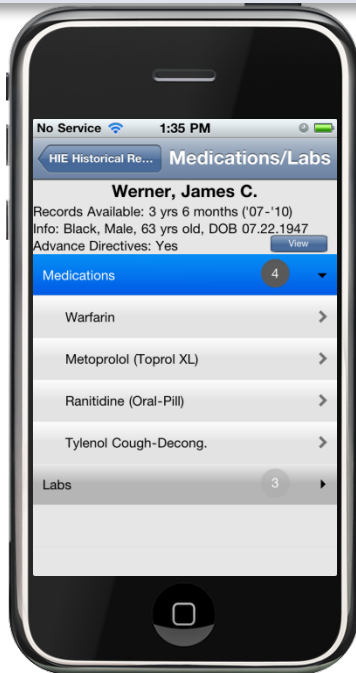
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- I. 1<sup>st</sup> Responders: B) HIE info impacts medication administration

The information gained from using the mHIE including medications and ongoing Problem List provides that the patient has a history of cardiac disease (including heart failure secondary to valve disease), was recently treated, and is taking warfarin. It appears to the paramedic as though there might be an electrolytic imbalance secondary to the dehydration that's causing an arrhythmia, appearing as 2nd degree heart block, and manifestations of heart failure, all of which might prompt the use of amiodarone.

From reviewing the mHIE at the flooded house, however, they know that the patient is taking warfarin, and thus opt not to administer amiodarone, and monitor the patient closely. The paramedic starts an IV, but from the HIE information they know it is imperative that they don't overload the patient with fluids which could potentiate the heart failure risk.



# mHIE END-TO-END WORKFLOWS

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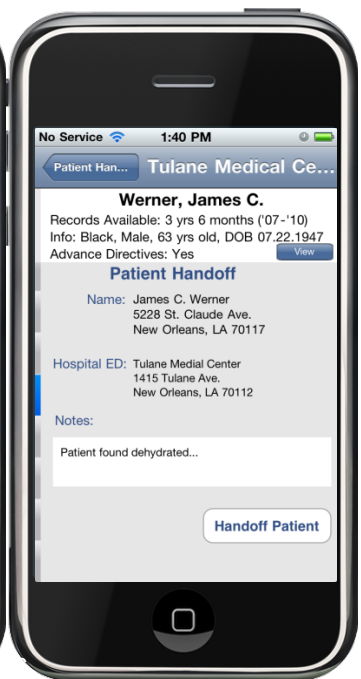
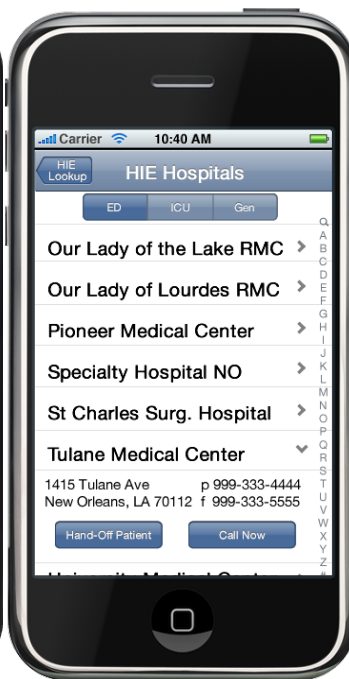
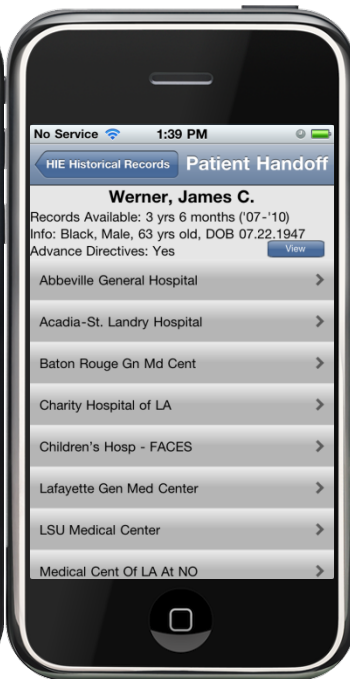
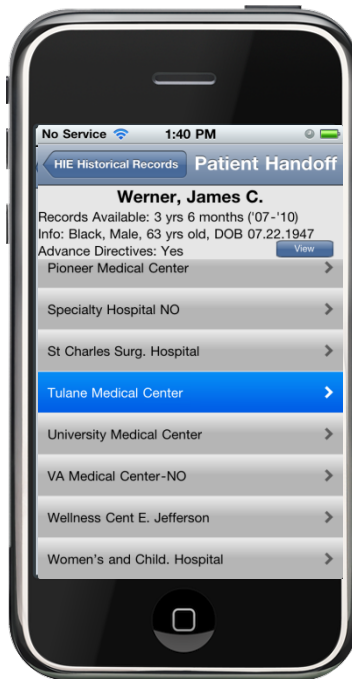
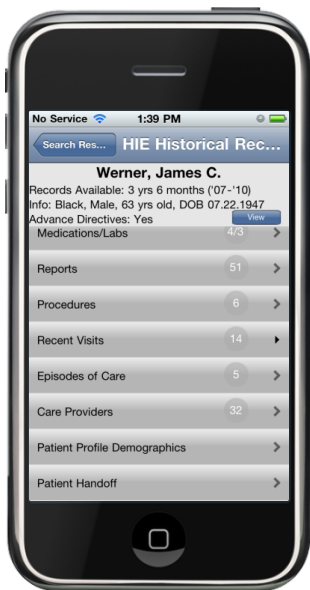


- **I. 1<sup>st</sup> Responders:** C) Alert to ED of patient en-route enables preparation

Patient is flown by medevac to hospital ED beyond the impact of the storm.

During the transfer the paramedic contacts the ED they are heading to and in addition to relaying information over the phone, she sends message with link to patient's HIE information and a brief description of what has transpired.

The ED triage nurse receives the electronic report from the paramedic, and holds a resuscitation room for the incoming patient. He also notifies the nursing supervisor and admissions that the patient will likely require an ICU bed. The ED attending is notified that the patient is en route, and reviews the paramedic's note and the patient's medical history via the mHIE, allowing him to better anticipate the patient's immediate needs on arrival to the ED.



# mHIE END-TO-END WORKFLOWS

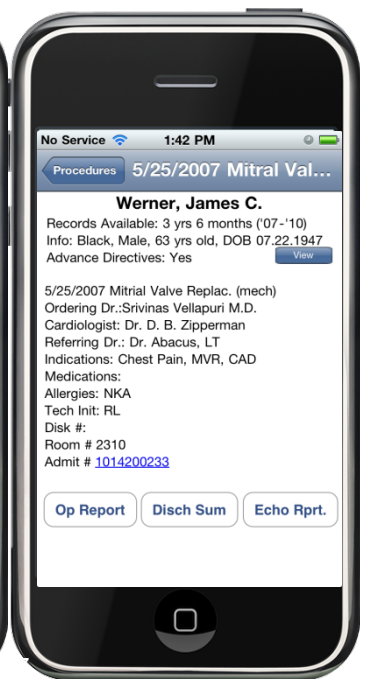
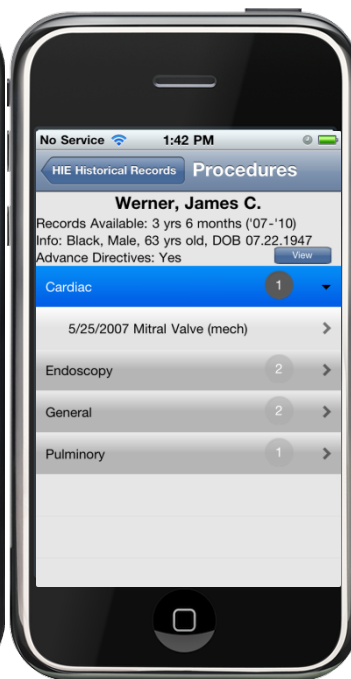
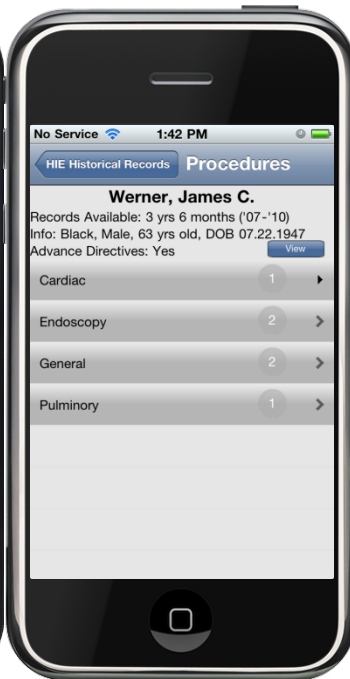
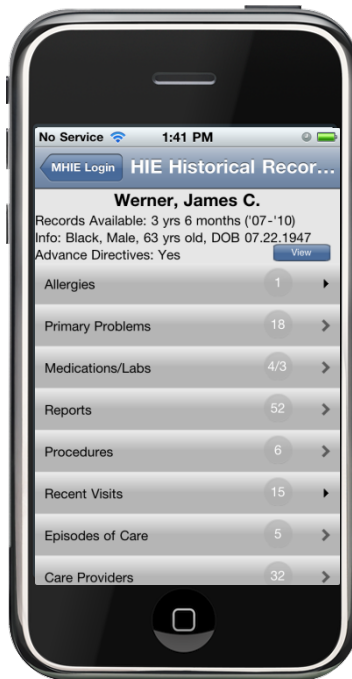
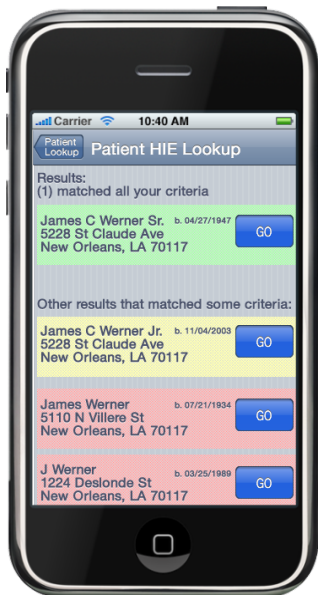
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## • II. ED Team & Specialists: A) On-Call Cardiologists Consults via iPhone

The dehydrated storm survivor patient arrives in ED, and during the workup, aggregated EHR information from the HIE provides that a mechanical mitral valve replacement had been performed at a different hospital that's attached to the HIE.

The ED physician has a suspicion that changes in the EKG are now indicative of heart failure and not dehydration and patient might be having or had a myocardial infarction. In order to meet the PCI 90-minute benchmark Door-to-Balloon time, cardiac enzyme labs are drawn and the on-call cardiologist, who is out having dinner, is called and consulted with.

The on-call cardiologist consults with ED doc while **reviewing patient's info from the HIE using his mobile device**. He sees what he needs from the valve procedure, changes the focus to ensure heart failure is ruled out ASAP, and orders a STAT 2-D echocardiogram and a BNP test.



# mHIE END-TO-END WORKFLOWS

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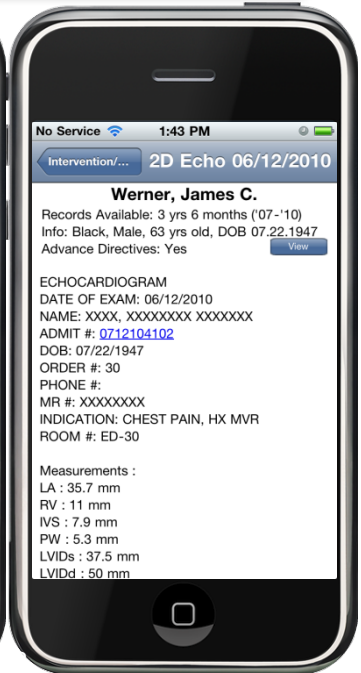
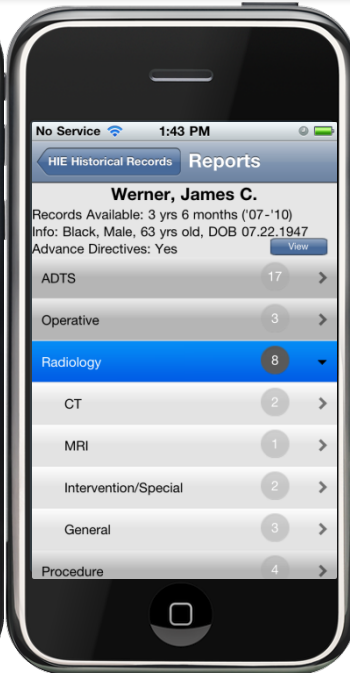
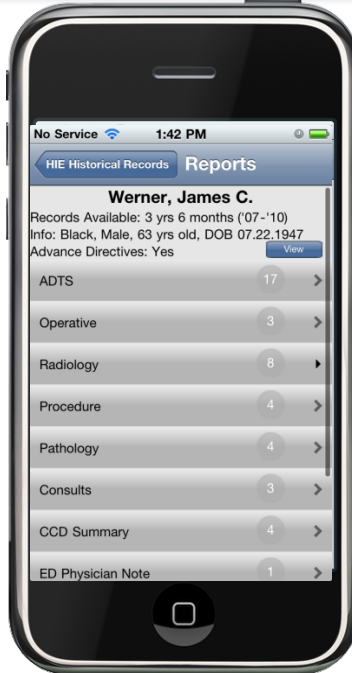
- II. ED Team & Specialists: B) On-Call Cardiologist reviews status on iPhone



On-call cardiologist checks in on Patient's status from mobile HIE app and sees that the 2-D echocardiogram and BNP test results have come in. After reviewing them contacts ED Physician who informs him things are not improving in spite of rehydration and they are beyond 45 minutes from when patient was wheeled into the room.

The accumulation of the bedside 2-D echo report, the 2<sup>nd</sup> consultative discussion with ED Physician on lab results, and noted new STEMI indications from ED work up that patient could be at risk for congestive heart failure, make for an emergency heart catheterization.

He activates the on-call catheterization team for a potential angiography to see what's going on and heads in to the hospital to perform the procedure well within the PCI 90-minute benchmark of Door-to-Balloon time.





# mHIE END-TO-END WORKFLOWS

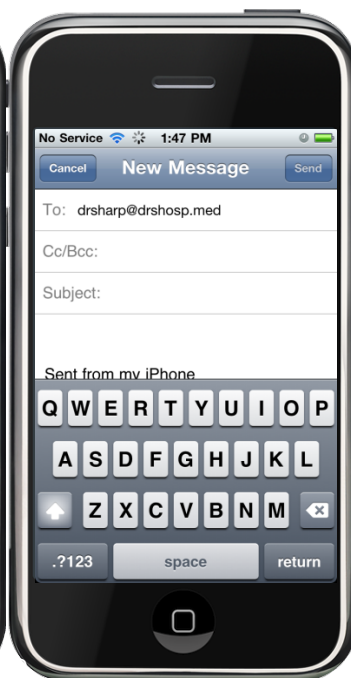
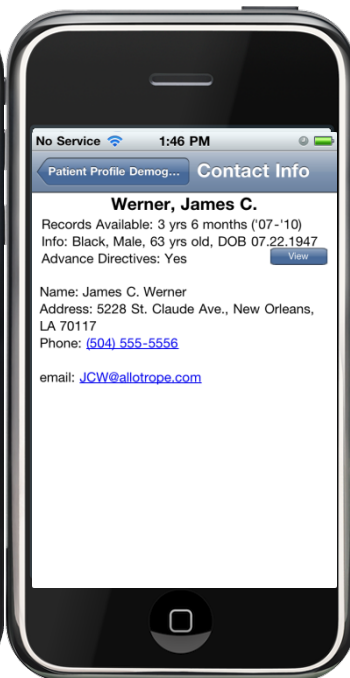
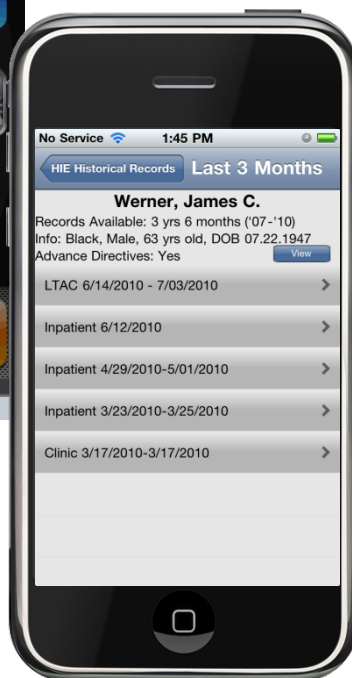
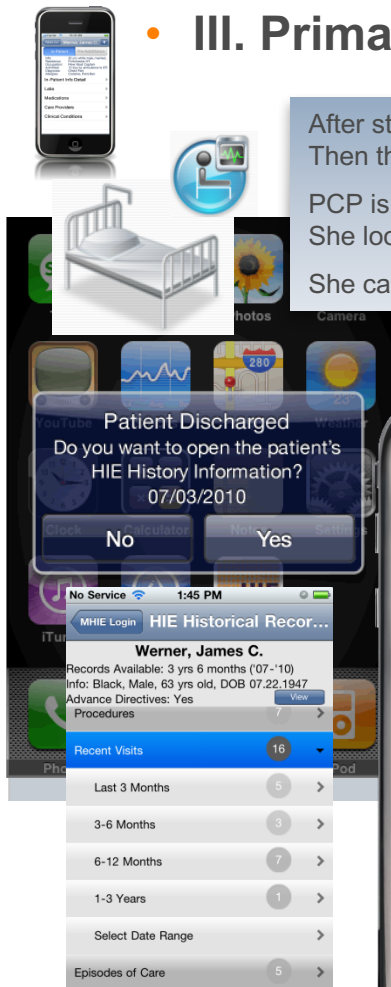
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- **III. Primary Care Physicians: Acts upon patient status alerts**

After stabilization, the patient is transferred from the hospital to a long term acute care facility (LTAC) for three weeks. Then the primary care physician is alerted by iPhone that her patient is being discharged from LTAC.

PCP is at home and **uses link in mobile alert to open patient HIE information** to review what's been happening. She looks at the most recent in-patient hospital visit and the LTAC discharge summary.

She calls the patient to see if they have any questions and schedules an appointment to follow up.



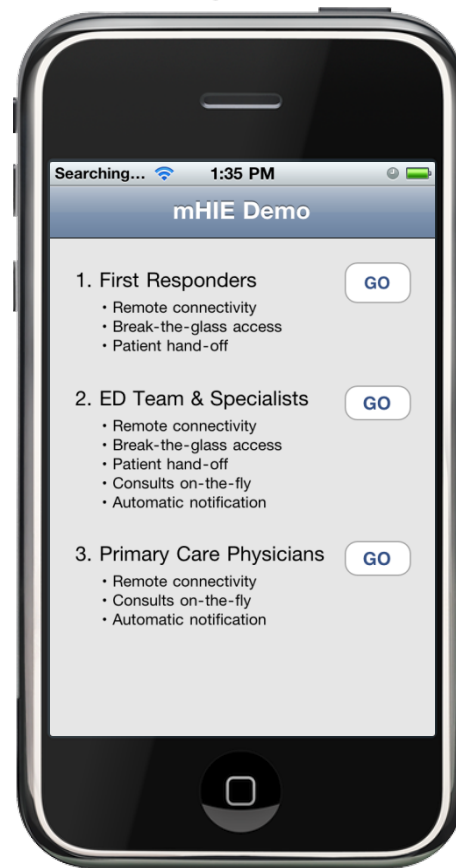
# mHIE WORK FLOW SCREENS

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## Home Screen



## Landing Screen- demo purposes only



# HIE Business Sustainability Concepts

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- Provide MPI services to HIE users for use in their institutions:
  - Provide back-up services for EHR down-time
  - Provide electronic lab result sharing
- Provide re-admission alerting in terms of:
  - Patient discharge compliance (example: did they see their primary care doctor within 2 days of discharge)
  - Readmit alerting (alert me to anyone who seeks urgent or emergency care within 1 week of discharge)
  - Readmit analytics
- Concurrent core measures / MU quality reporting



# HIE Business Sustainability Concepts

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- Provide patients with an electronic copy
  - of their health information.
  - of their discharge instructions at time of discharge.
- Capability to exchange key clinical information across providers and patient authorized entities.
- Medical Home Coordination
- CDS Tools
  - Drug-interaction checking
  - Clinical standards compliance / gap in care identification
  - Drug dosing calculators



# HIE Business Sustainability Concepts

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- PHR interface
  - HIE to PHR data transfer (MS HealthVault/Google Health)
  - Patient access to information specific to Meaningful Use
  - Patient consent management
- Advanced Directive capture & sharing
- Public Health Reporting
  - Reportable diseases
  - Vaccination registry
  - Syndromic Surveillance
  - Birth / death certificate info transfer

