Using EHRs to extract information, query clinicians, and insert reports

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NIH HCS Collaboratory
EHR working group webinar
March 26, 2013

E S P – V A E R S

Electronic Support for Public Health Vaccine Adverse Event Reporting System

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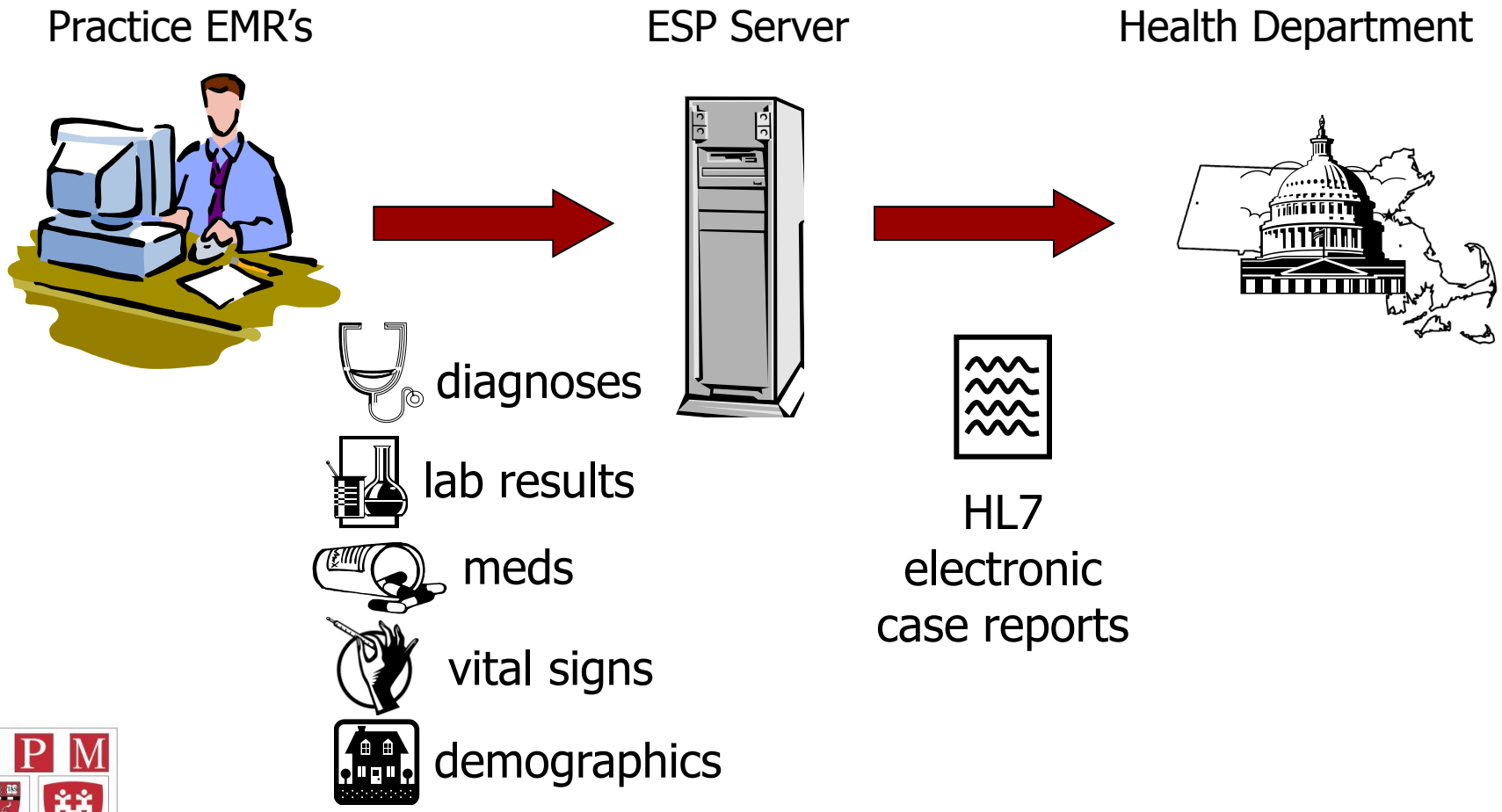
Project Funding from the Centers for Disease Control and Prevention (CDC) SHEPheRD Program
(*contract # 200-2011-42037*)

Extracting information

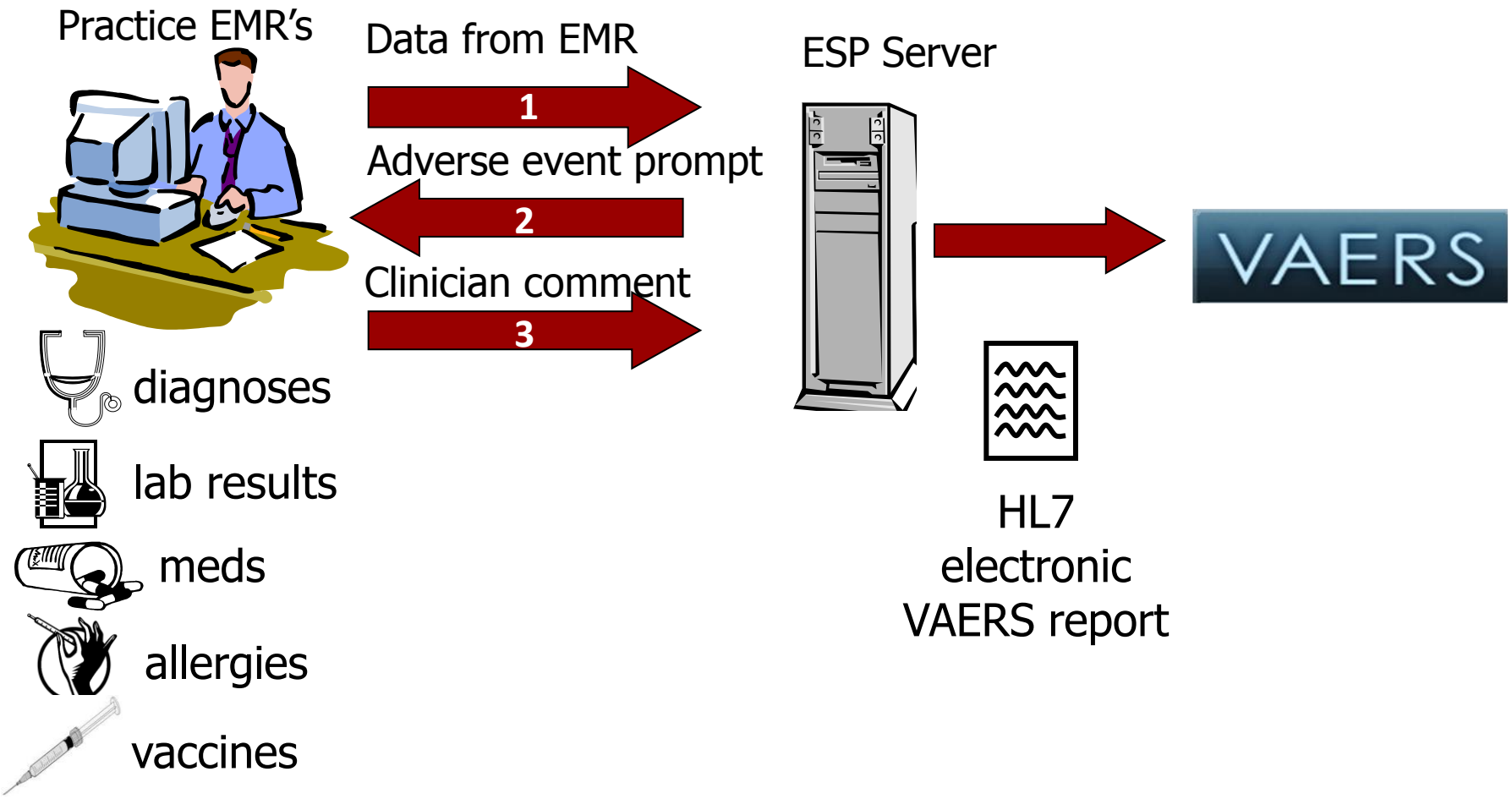
ESP: Automated disease detection and reporting for public health



JAMIA 2009;16:18-24

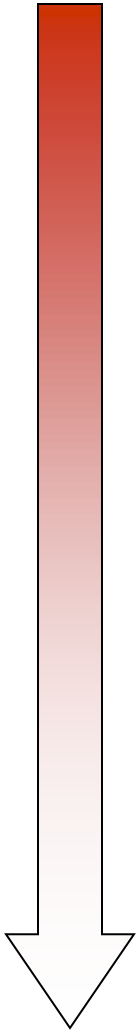
Using the EHR to Query Clinicians

ESP: Automated detection and reporting with clinician input



JAMIA 2009;16:18-24

Example ESP-VAERS Logic



Day 0 – measles vaccine administered

Day 6 – patient diagnosed with meningitis

1. Assess patient's past encounters → no ICD-9 for meningitis in the past year
2. Send message to patient's clinician "could this be related to recent vaccine?"

Sending a message to the clinician's InBasket

- Message to the clinician is HL7 text message
  - Identifies patient, provider
  - Records information about the condition of interest
  - Saved to file system directory and database record
- Epic picks up text message
- Files and loads them via Transcription Interface
  - EMR
  - Message appears in provider InBasket

ESP — Electronic Support for Public Health

Patient name [MRN]	Xb, Klompas V [10]	Gender	Male
Date of birth [age]	27-Jan-1936 [76 years]	Telephone number	(555) 977-2727

Reviewing Clinician	Klompas, Michael
Primary Care Provider	McVetta, Jason

Your patient received the following vaccination on Jan 21, 2010

influenza, H5N1-1203

We noted the following potentially concerning events after vaccination:

Event Date	Days Since Vaccine(s) given	Encounter Type	Labs	Diagnosis	Prescription	Allergies
05-Feb-2010	15	Ambulatory		Meningitis 321.2		

Possible Adverse Event?

- ( ) **Yes, submit the adverse event report to CDC/FDA**
- (•) **No**

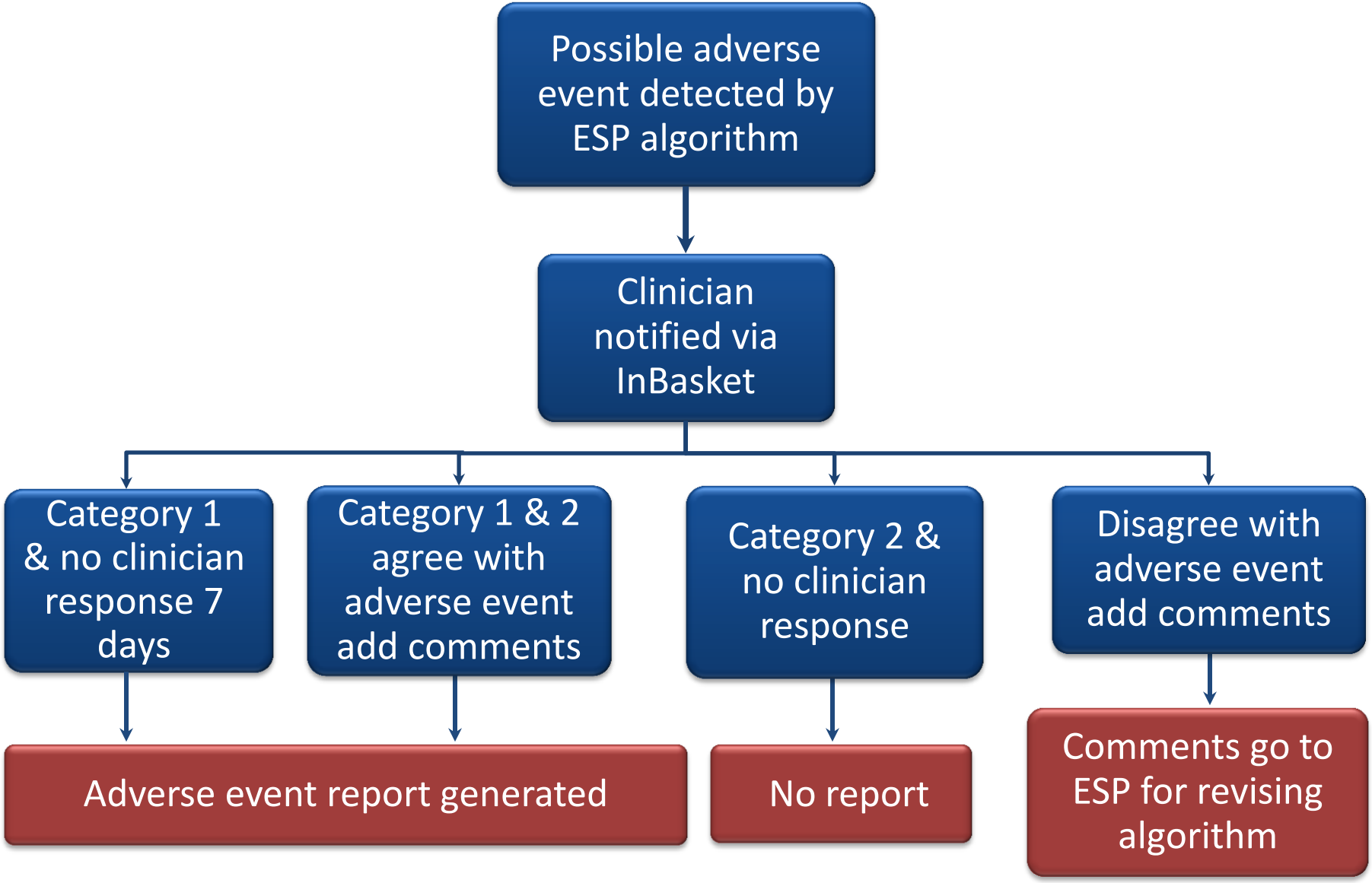
Please provide details so that we can refine our adverse event detection algorithms:

Example ESP-VAERS Logic

Day 0 – measles vaccine administered

Day 6 – patient diagnosed with meningitis

1. Assess patient's past encounters → no ICD-9 for meningitis in the past year
2. Send message to patient's clinician "could this be related to recent vaccine?"
   a. No → stop
   b. Yes → clinician invited to add comments
3. Send HL7 report to VAERS


Possible adverse event detected by ESP algorithm
Clinician notified via InBasket
Category 1 & no clinician response 7 days
Category 1 & 2 agree with adverse event add comments
Category 2 & no clinician response
Disagree with adverse event add comments
Adverse event report generated
No report
Comments go to ESP for revising algorithm

Messages to VAERS

- HL7 message to CDC specifications
- Report includes
  - Patient name, gender, date of birth, contact
  - Reporting clinician name and contact
  - Vaccine name, lot number, date of administration
  - Adverse event, date, value
    - last known lab value if appropriate
  - Did adverse event require ER Visit/Hospitalization*
  - Other vaccinations within 4 weeks prior to the date listed
  - Clinician comments

* In April, 2013

Inserting an updated report into the EHR

If HL7 message sent to CDC

- ESP generates VAERS report
- ESP generates new HL7 text message
  - Picked up by the Transcription Interface
  - New message updates patient's Epic EHR
    - Initial Epic report updated with new information that a VAERS report has been submitted

Pros and cons of exporting/importing vs adding reporting functionality to the EHR

- Pros
  - Allows fully customized algorithms and reporting formats
  - Doesn't slow the EHR's response time
  - No engagement with host IT department needed for modifications
  - Doesn't increase EHR's code base and associated license fees
  - New capabilities are readily portable to a wide array of EHRs
  - Reports can be directed to appropriate person: primary care doctor, team manager, clinician who assigned a diagnosis, social worker, etc.
- Cons
  - Doesn't operate in real time, e.g., during a patient encounter (sometimes this is desirable)
- Neutral
  - Host organization retains complete control over its data

For more information:

https://www.nihcollaboratory.org/Pages/ehr-data-faqs.aspx

Recommendations, feedback,
and questions:

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