

# The Impact of Pre Hospital Blood Collection on Time to Laboratory Test Results and Emergency Department Length of Stay

Improving the Odds on Quality  
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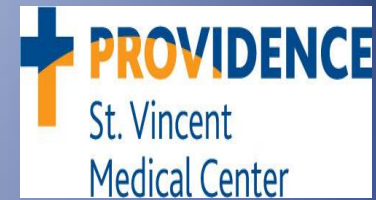
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by  
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# OBJECTIVES



- Identify the importance of pre hospital paramedics initiating blood specimen collection prior to patient arrival
- Describe benefits of pre hospital paramedics obtaining blood specimens on emergency department throughput.





University of Michigan  
SCHOOL OF MEDICINE  
HOSPITAL

Entrance

Emergency

East Pavilion  
Patient Drop Off

← EMERGENCY  
← West Parking  
← Patient Drop Off  
← Free Valet Parking



# First Magnet Hospital in Oregon in 2000





OREGON

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***EMERGENCY  
DIAL 911***





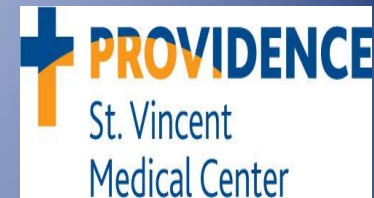


# STUDY

## AIM

- 1) Retrospective observational study to assess the efficacy of obtaining laboratory specimens in the pre-hospital environment
- 2) Efficacy was measured by six dependent variables:
  - a) Laboratory arrival time of specimens
  - b) Turnaround time of CBC results
  - c) Turnaround time of chemistry results
  - d) Physician decision time for disposition
  - e) Length of stay in the ED
  - f) Rate of hemolysis





# DESIGN

- \*Retrospective observational study enrolling patients who arrive in the ED by ambulance after having had blood drawn at time of IV placement by pre-hospital personnel as well as those patients who did not have blood drawn at the time of IV placement**
- \* Data that will be collected includes:**
  - time of patient arrival**
  - time blood sent to lab**
  - time blood received in lab**
  - time results received**
  - time of patient disposition**
  - total length of stay**
  - presence or absence of hemolysis of the lab specimen**





# SUBJECT POPULATION



- Any adult patient who has received an IV by pre-hospital personnel with either:
  - Blood drawn during insertion of the IV
  - No blood drawn during IV insertion
- No Kaiser Permanente patients
- No pediatric lab tubes
- A minimum of 100 patients





# PROCEDURES



- Pre-hospital agency involved in the study include:
  - Metro West Ambulance
  - The medics will be provided with necessary equipment to obtain blood samples (purple top, green top, yellow top lab tubes, safe set blood transfer device, IV extension set)
  - A package will be given to the medics participating in the study with all equipment necessary
  - A card will be in the packet with equipment
  - This card will be given to admitting on arrival to the emergency department The name of the patient will be written on the card along with a date of birth in order to identify the lab specimens
  - There will be a locked box on the purple side admitting desk where all ambulances check-in
  - Admitting or the medics will drop the card in the locked box for later data gathering



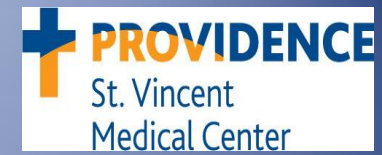
# RESULTS

- 1) 101 patients were enrolled
  - a) 58 patients had prehospital labs
  - b) 43 patients had hospital labs
  
- 2) CBC specimens requiring redraw
  - a) 1 prehospital patient (1.7%)
  - b) 0 hospital patients (0%)
  
- 3) Chemistry specimens requiring redraw
  - a) 3 prehospital patients (5.1%)
  - b) 2 hospital patients (4.7%)

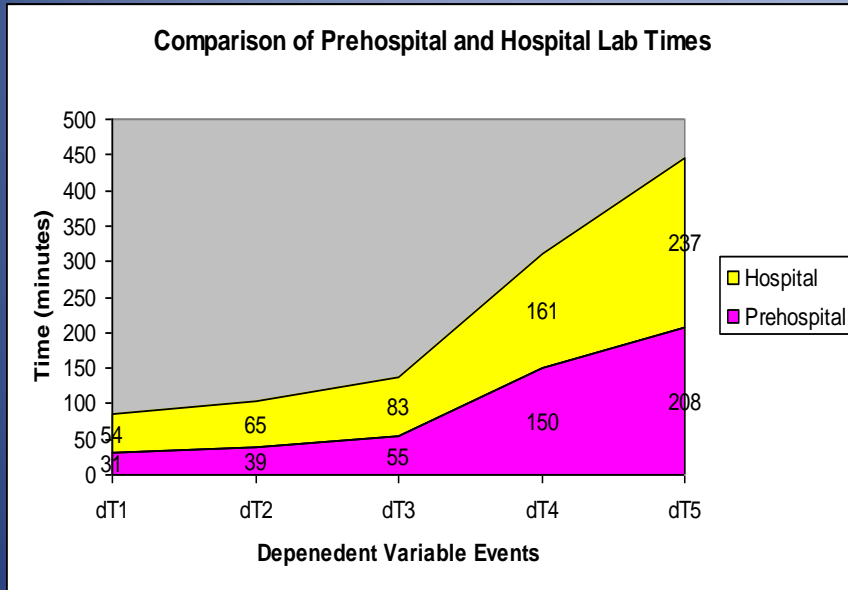




# RESULTS



- dT1= Time between admission and specimen arrival in the lab
- dT2= Time between admission and CBC results
- dT3= Time between admission and chemistry results
- dT4= Time between admission and physician decision for disposition
- dT5= Time between admission and disposition (length of stay)



Dependent Variables	dT1*	dT2**	dT3***	dT4	dT5
Pre-hospital (minutes)	31	39	55	150	208
Hospital (minutes)	54	65	83	161	237

dT1\* p < 0.01 (Student's t-test)  
 dT2\*\* p < 0.004 (Student's t-test)  
 dT3\*\*\* p < 0.02 (Student's t-test)





# CONCLUSIONS



- 1) Specimens obtained by the paramedic crew had chemistry (28 minutes) and complete blood count (26 minutes) results more rapidly available which were statistically significant.
- 2) The length of stay was 29 minutes shorter for patients who had labs obtained by the paramedics, but statistical significance was not achieved.
- 3) Physician decision time for disposition was not associated with laboratory result turn-around-time, but was statistically significant regarding the disposition (admission or discharge home) of the patient.
- 4) No significant difference found between pre-hospital labs and hospital labs when either the CBC or chemistry was required to be redrawn.



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EMERGENCY  
MEDICAL  
SERVICES





# IMPLICATIONS



- 1) Clinically significant lab results (ie. low potassium, anemia, etc.) will be able to be addressed by the clinical staff about **27** minutes earlier if the lab specimens are obtained by the pre-hospital staff.
- 2) The average daily census during the study was **242**. Of that, an average of **41** patients were ambulance patients. If the average length of stay for patients that have labs obtained prior to arrival to the ED is **29** minutes, then this would translate to **19.8 hours saved per day**; therefore decrease ambulance diversion time and ED lobby “wait time”. Since the average length of stay for all patients is **3.5 hours** then this would allow approximately **6** more patients to be seen per day. Currently the census growth for this ED is **5%** per year which then translates to a potential increase of **20.8** hours saved per day if the labs are obtained by the pre-hospital staff.
- 3) The physician decision time for disposition was significantly related to the disposition of the patient and was probably more related to the overall clinical presentation of the patient rather than only to the actual laboratory results.





# MORE IMPLICATIONS



- Shorter length of stays improve ED throughput and patient satisfaction.
- Builds collegial partnerships with EMS providing seamless care from first contact in the field to arrival in the emergency department.
- Collaborative evidence based care with EMS helps to meet national benchmarks for such things as Acute MI, Pneumonia, and stroke.



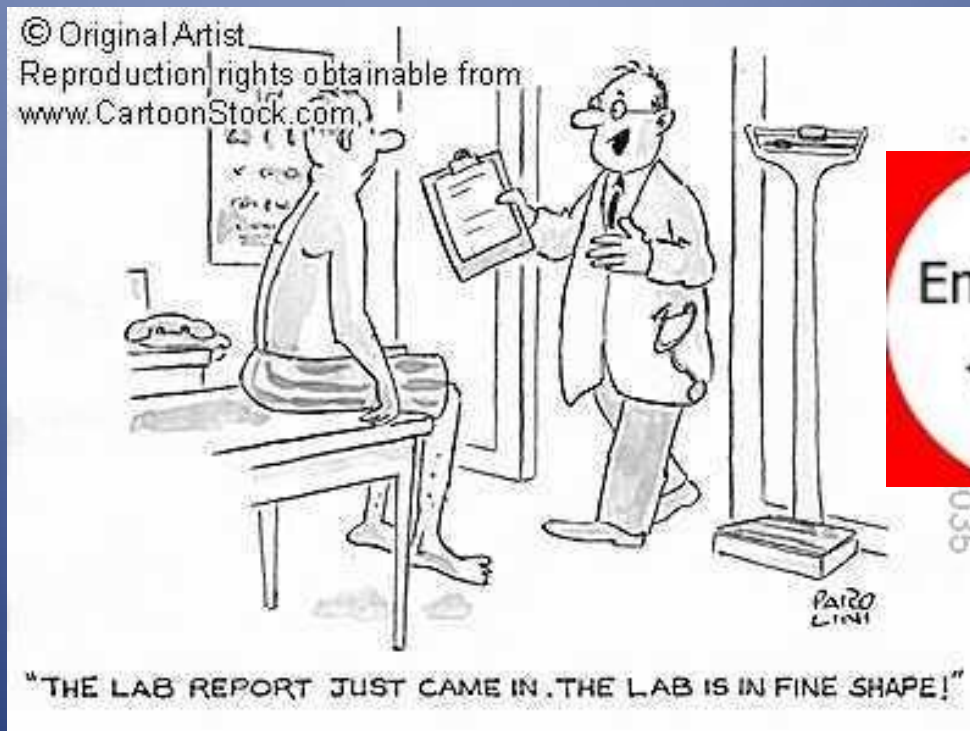
# IMPLICATIONS CONTINUED

- EMS is now included in many of our meetings that involve patient care improvement initiatives.
- Care planning with EMS is really simple, but effective.
  - Blood draw prior to arrival in emergency department
  - IV placement prior to arrival to facilitate such things as CT contrast studies



# FINAL IMPLICATIONS

- Earlier initiation of Nurse Initiated Orders
- Lab results back prior to physician seeing the patient.













# GUIDELINES AND POLICIES

- Work with Quality Management, Laboratory, Emergency Department Management, Emergency Physicians
- Washington County Emergency Medical Services
- Protocols written for process in the field.
- Hospital guidelines and policies written.





# TEACHING

- Hospital emergency staff including emergency technicians, registration, health unit coordinators, doctors and nurses.
- Washington County Emergency Medical Services staff.
- Metro West Ambulance staff
- Hospital laboratory staff.

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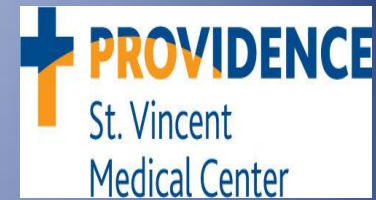
# COMMUNITY IMPACT

- Collaboration with 2 other health systems in our area.
- Lab draw process explained with benefits.
- Quality control explained and defined.









# TEAMWORK

- The reason most people think that something cannot be done is because they know that they can't do it by themselves. But impossible things can be done if we join together in the task.



# REFERENCES



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# Questions?



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