D³ - Drug Delivery Delay
June 24, 2011

Clinical Safety & Effectiveness
Cohort # 7

CENTER FOR PATIENT SAFETY & HEALTH POLICY

UT HEALTH SCIENCE CENTER™

SAN ANTONIO

Educating for Quality Improvement & Patient Safety

DISCLOSURE

The Team

- Kevin Flemmons, MD   CSE Team member
- Monica Horton, MD   Med Safety Team Leader
- Edna Cruz, RN, MS, CPHQ   Advisor
- Katherine Alford, RN   Nursing Education
- Yvonne B. Davila, RN   Quality Management
- Sheryl Gunther, PharmD   QI Pharmacist
- Doris Okunbor, RN   Nurse Manager
- Mark J. Wong, PharmD   Clinical Pharmacist
- Darryl E. Reid, Sr., RN, MSN   Clinical Informatics Nurse

- **Sponsor Department**
  - Deborah Baruch-Bienen, MD, MA Ethics, FACP
    - Chief, Medicine Service, STVHCS AMD
  - Luci Leykum, MD, MBA, MSc
    - Division Chief, Hospital Medicine, UTHSCSA

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The Team

Aim

- Decrease the order to administration time for Stat, Now and Once antibiotics by 25 percent by May 30, 2011.

Project Milestones

- Team Created   January 2011
- AIM statement created   February 2011
- Twice Weekly Meetings   1/25-2/24/2011
  ◦ Background Data, Brainstorm Sessions
- Flow and Causation   2/18/2011
- Interventions Implemented
  ◦ Red Dot –Additional runner   3/10/2011
  ◦ Common Antibiotics Stocked   4/12/2011
  ◦ Nurse Education   5/11/2011
- Data Analysis   6/13/2011
- CS&E Presentation   6/24/2011

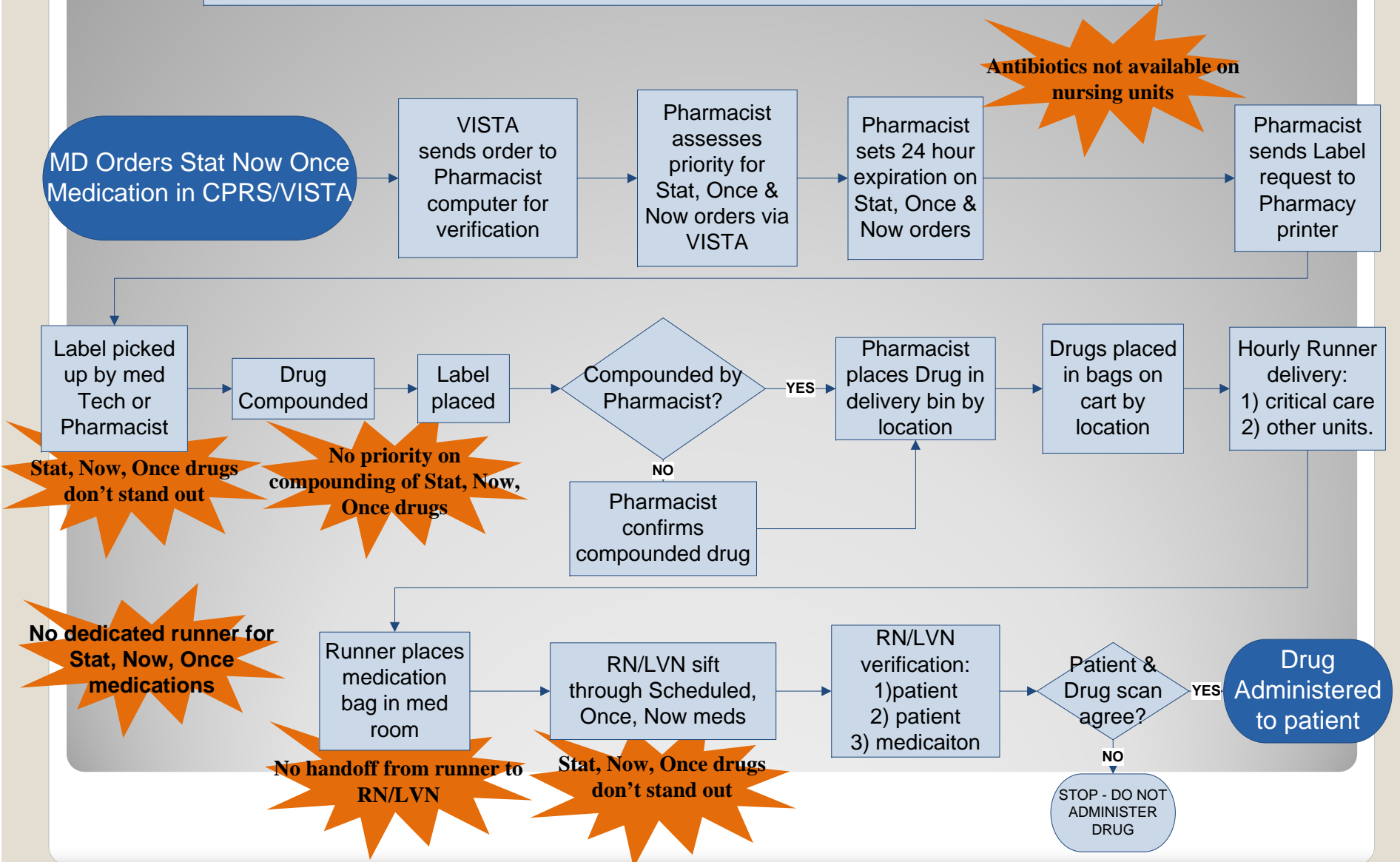# Background

- ePIR data (electronic Patient Incident Report) Q1FY11 (Oct-Dec 2011)
  - 173 medication errors reported
  - - MD Orders   108
  - - Administration   34
  - - Dose   33
  - - Dispensing   23
  - **- Delivery   23**

Delivery

- 19 of 23 or 83% of incidents citing delayed delivery to the nursing units from the pharmacy

- Under reported by nurses

- High potential for harm to the patient, especially in the area of timely antibiotic administration

  ◦ Mortality is significantly increased in patients who receive initial antibiotics after recognition of shock. [1-2]

  ◦ Early antibiotic administration (within 4 hours) reduces the risks of mortality in patients with bacteremic pneumococcal pneumonia. [3]

- Antibiotic administration is High risk in nature & occurs very frequently

D³ - Drug Delivery Delays
Pre-Intervention Flow Diagram

MD Orders Stat Now Once Medication in CPRS/VISTA →

VISTA sends order to Pharmacist computer for verification →

Pharmacist assesses priority for Stat, Once & Now orders via VISTA →

Pharmacist sets 24 hour expiration on Stat, Once & Now orders →

Antibiotics not available on nursing units

Pharmacist sends Label request to Pharmacy printer →

Label picked up by med Tech or Pharmacist →

Stat, Now, Once drugs don't stand out

Drug Compounded →

No priority on compounding of Stat, Now, Once drugs

Label placed →

Compounded by Pharmacist?
- YES → Pharmacist places Drug in delivery bin by location
- NO → Pharmacist confirms compounded drug → Pharmacist places Drug in delivery bin by location

Drugs placed in bags on cart by location →

Hourly Runner delivery:
1) critical care
2) other units. →

No dedicated runner for Stat, Now, Once medications

Runner places medication bag in med room →

No handoff from runner to RN/LVN

RN/LVN sift through Scheduled, Once, Now meds →

Stat, Now, Once drugs don't stand out

RN/LVN verification:
1) patient
2) patient
3) medicaiton →

Patient & Drug scan agree?
- YES → **Drug Administered to patient**
- NO → STOP - DO NOT ADMINISTER DRUG

D³ - Drug Delivery Delays
Cause and Effect Diagram

People

No IV access

Nurse delays in administering drugs

No CPRS alert of Stat, Once, Now order

Patient off floor

No nurse notification of Stat, Once, Now Drug order

Pharmacist May be used for STAT deliveries

Deliveries run q 50 minutes

MD does not know to order med as Stat, Once, or Now

No Dedicated Runner

Plant

No tube system

Elevator Delays

Centralized Pharmacy

Distant route to units

No priority in VISTA Queue For Stat, Once, Now

No priority setting of drugs on nursing units

Pharmacy Tech pulled to do deliveries

Nurse not notified of med arrival

Omnicel availability

Unclear Escort Role regarding Stat, Once, Now orders

Timely Drug Administrtion

No defined time to administration For Stat, Once, Now meds

No visual cue for Stat, Once, Now orders

Drug delivery priority is critical care 1st regardless of Stat, Once & Now orders

Compounding materials - IV solutions

IV access supplies

No time definition for Stat. Once & Now orders

Drug Shortage

Policies & Procedures

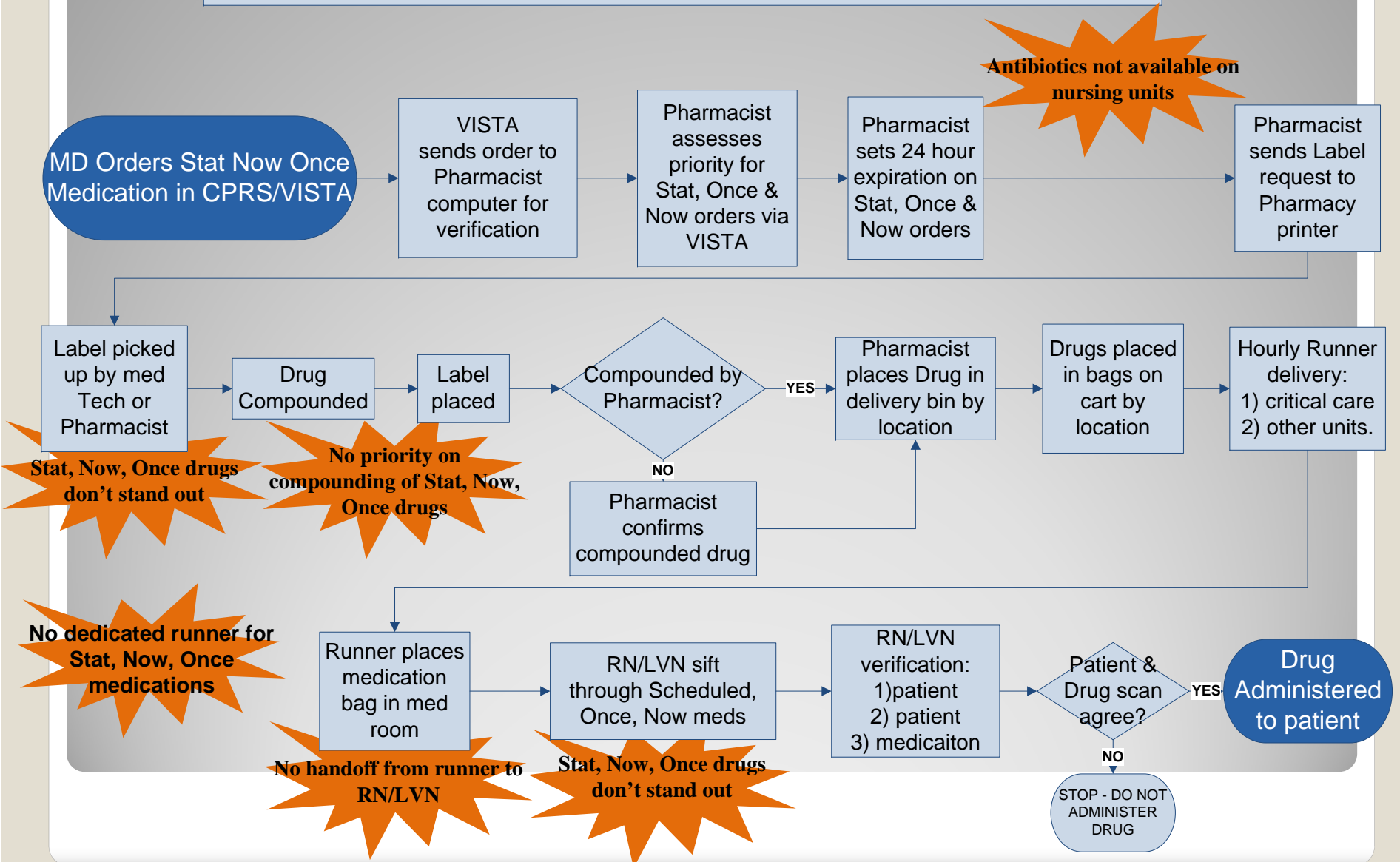**Equipment & Supplies**

Interventions

- **Red Dot**
  - on all Stat, Now, Once meds
- **Additional Dedicated Runner**
  - for Stat, Now, Once meds
- **Common Antibiotics Stocked**
  - on nursing units
- **Nurse Education**
  - on med administration expectation

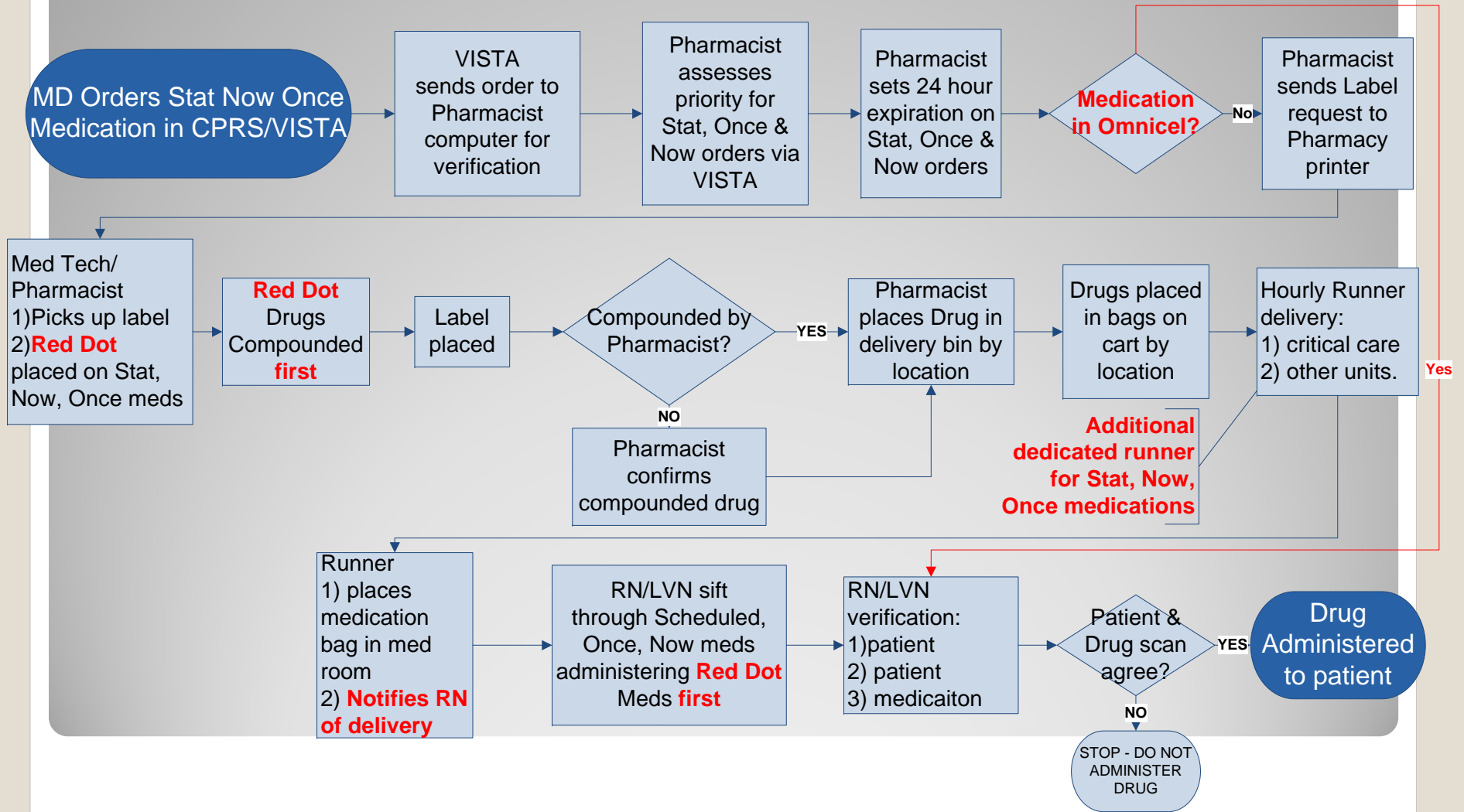# Interventions

- **Red Dot**   3/10/11
  ◦ on all Stat, Now, Once meds
- **Additional Dedicated Runner**   3/10/11
  ◦ for Stat, Now, Once meds
- **Common Antibiotics Stocked**   4/12/11
  ◦ on nursing units
- **Nurse Education**   5/11/11
  ◦ on med administration expectation

D³ - Drug Delivery Delays
Pre-Intervention Flow Diagram

Antibiotics not available on nursing units

MD Orders Stat Now Once Medication in CPRS/VISTA → VISTA sends order to Pharmacist computer for verification → Pharmacist assesses priority for Stat, Once & Now orders via VISTA → Pharmacist sets 24 hour expiration on Stat, Once & Now orders → Pharmacist sends Label request to Pharmacy printer

Label picked up by med Tech or Pharmacist → Drug Compounded → Label placed → Compounded by Pharmacist? —YES→ Pharmacist places Drug in delivery bin by location → Drugs placed in bags on cart by location → Hourly Runner delivery: 1) critical care 2) other units.

Stat, Now, Once drugs don't stand out

No priority on compounding of Stat, Now, Once drugs

Compounded by Pharmacist? —NO→ Pharmacist confirms compounded drug

No dedicated runner for Stat, Now, Once medications

Runner places medication bag in med room → RN/LVN sift through Scheduled, Once, Now meds → RN/LVN verification: 1)patient 2) patient 3) medicaiton → Patient & Drug scan agree? —YES→ **Drug Administered to patient**

Patient & Drug scan agree? —NO→ STOP - DO NOT ADMINISTER DRUG

No handoff from runner to RN/LVN

Stat, Now, Once drugs don't stand out

D³ - Drug Delivery Delays
Post-Intervention Flow Diagram

MD Orders Stat Now Once Medication in CPRS/VISTA

→ VISTA sends order to Pharmacist computer for verification

→ Pharmacist assesses priority for Stat, Once & Now orders via VISTA

→ Pharmacist sets 24 hour expiration on Stat, Once & Now orders

→ **Medication in Omnicel?**

— No → Pharmacist sends Label request to Pharmacy printer

Med Tech/ Pharmacist
1) Picks up label
2) **Red Dot** placed on Stat, Now, Once meds

→ **Red Dot** Drugs Compounded **first**

→ Label placed

→ Compounded by Pharmacist?

— YES → Pharmacist places Drug in delivery bin by location

— NO → Pharmacist confirms compounded drug

→ Drugs placed in bags on cart by location

→ Hourly Runner delivery:
1) critical care
2) other units.

Additional dedicated runner for Stat, Now, Once medications

Yes

Runner
1) places medication bag in med room
2) **Notifies RN of delivery**

→ RN/LVN sift through Scheduled, Once, Now meds administering **Red Dot** Meds **first**

→ RN/LVN verification:
1) patient
2) patient
3) medicaiton

→ Patient & Drug scan agree?

— YES → **Drug Administered to patient**

— NO → STOP - DO NOT ADMINISTER DRUG

ALERT: Process Change

A red dot 🔴 priority system for processing 1ST **Dose of Antibiotics, *STAT, NOW* & *ASAP*** medications was developed to ensure timely drug administration at the bedside.

The red dot indicates the highest priority for medication administration.

Medications with a red dot should be administered ***IMMEDIATELY*** upon receipt on the nursing units.
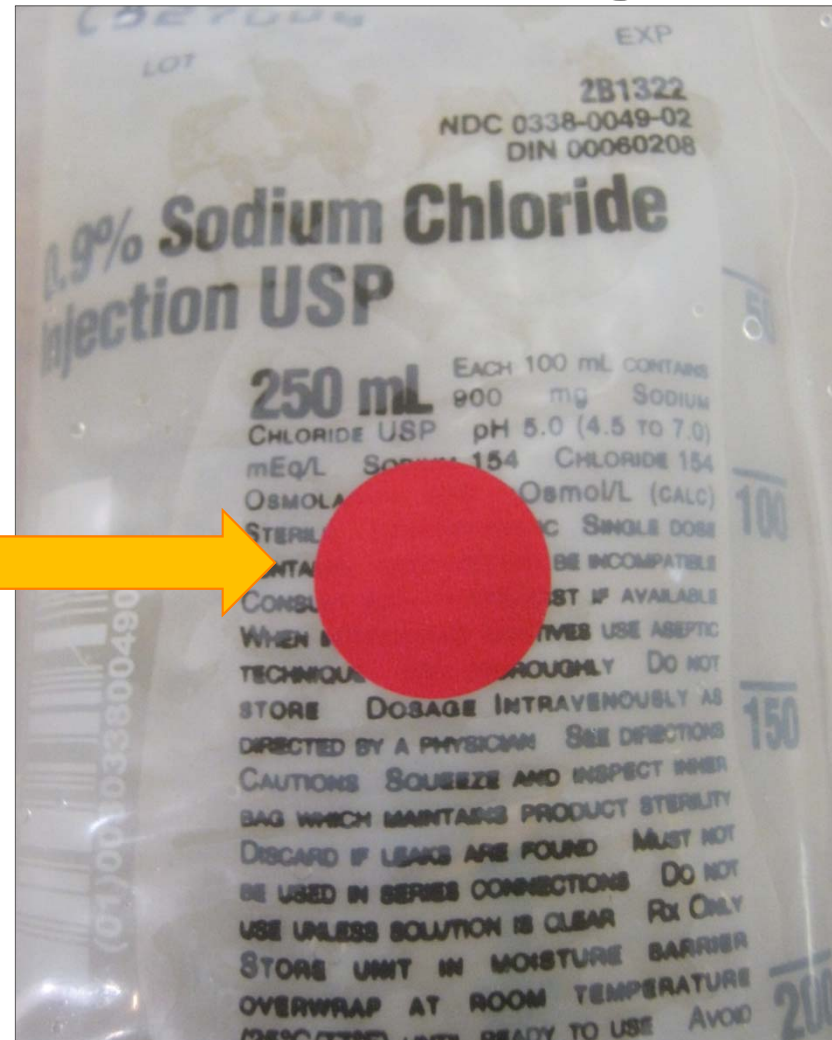
Data

- 991 Total antibiotics
  - 301 baseline data   12/1/10-3/10/11
  - 292 first intervention   3/10/11-4/12/11
  - 232 second intervention   4/13/11-5/10/11
  - 166 third intervention   5/11/11-5/30/11

Data

Total minutes X

Interventions
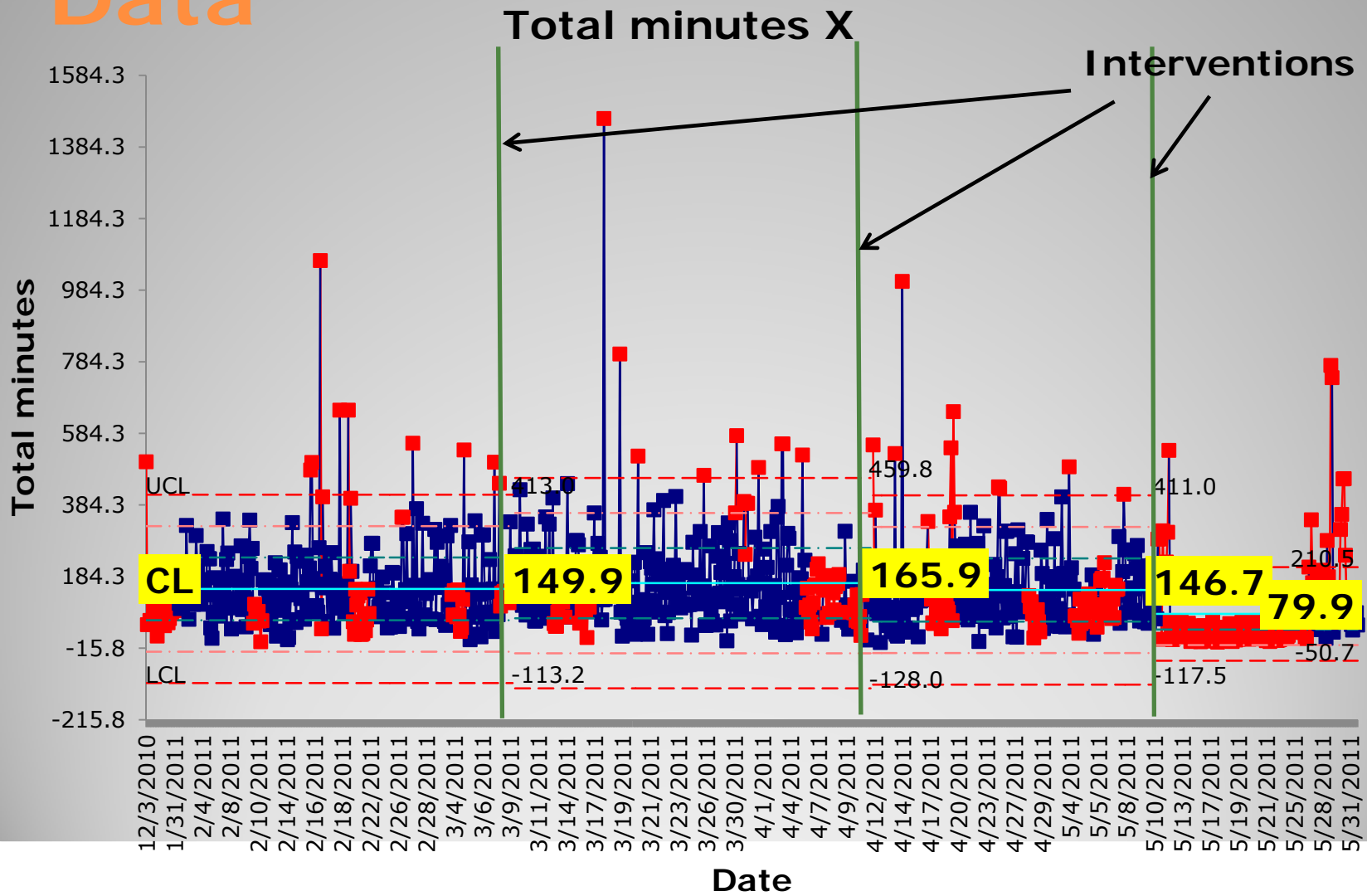
Return on Investment

- Future Data collection
  - LOS
  - Mortality rates

- Value added
  - Pharmacist efficiency
  - Patient/Nurse satisfaction

Spread

- Stocking of Antibiotics on all units
- Stocking of other essential medications
- Rollout at Kerrville campus
- Transparency in Turnaround Times
  - Quarterly reporting to senior leadership

Future

- Nurse alert for Stat Now Once orders
- Expected administration time
  - On provider order
  - On medication label

Barriers

- New tasks for nursing
  - Compounding antibiotics
- Data collection
  - Multiple sources
  - Duplication of data

Lessons Learned

- Physicians/Nurses/Pharmacists have different expectations
- Data is essential

Conclusion

- Small changes = big impact

- Communication is essential

- Don't forget Education of staff

References

1. **Association between timing of antibiotic administration and mortality from septic shock in patients treated with a quantitative resuscitation protocol.** Puskarich MA, Trzeciak S, Shapiro NI, Arnold RC, Horton JM, Studnek JR, Kline JA, Jones AE; on behalf of the Emergency Medicine Shock Research Network Crit Care Med. 2011 May 12

2. **Impact of time to antibiotics on survival in patients with severe sepsis or septic shock in whom early goal-directed therapy was initiated in the emergency department.** *Gaieski DF, Mikkelsen ME, Band RA, Pines JM, Massone R, Furia FF, Shofer FS, Goyal M. Crit Care Med. 2010 Apr; 38(4):1045-53.*

3. **Treatment and outcomes for patients with bacteremic pneumococcal pneumonia.** Berjohn CM, Fishman NO, Joffe MM, Edelstein PH, Metlay JP.Medicine (Baltimore). 2008 May;87(3):160-6.

questions