

# ABC's of a Trauma Performance Improvement (PI) Plan

## Session 3 of a 3 Part Series

### Applying Concepts of PI: Ongoing Evaluation and Closing the Loop

**Objective:** Participants will build upon cumulative knowledge from Parts I and II of this series to further understand how to evaluate the performance improvement and patient safety (PIPS) process, use trauma registry data to inform injury prevention activities, and perform loop closure.

**St. Joseph's Hospital and Medical Center**  
El Dorado Conference Room\*  
350 West Thomas Road | Phoenix, Arizona 85013

**Friday, November 21, 2014**  
**9:00 AM – 5:00 PM**

Presented by the Arizona Bureau of EMS & Trauma System (BEMSTS),  
the Arizona Rural Hospital Flexibility Program (AZ-Flex), and St. Joseph's Hospital and Medical Center.

0900 Welcome & Introductions	Michelle Guadnola Terry Mullins
0910 Review of Agenda	Joyce Hospodar
0915 BEMSTS Data & Quality Assurance Report	Rogelio Martinez
0945 Review of PI Identification and Action Plan	Arvie Webster
1030 Break	
1045 Loop Closure	Lori Wass
1145 Lunch & Network Courtesy of St. Joseph's Hospital and Medical Center	
1245 Ongoing Evaluation of PIPS	Cecile D'huyvetter
1345 Break	
1400 Incorporating the Trauma Registry into Injury Prevention	Dr. Pam Goslar
1500 Trauma Center Improvement: The Proof is in the Pudding	Dr. Scott Petersen
1530 Loop Closure Exercise	Michelle Guadnola / Tiffany Strever
1630 Wrap-up, General Questions, and Future Directions	Open Forum
1700 Tour of St. Joseph's Hospital and Medical Center	Michelle Guadnola

**Series Purpose Statement:**

*Trauma Programs are required to have an effective Performance Improvement (PI) plan in place to assist in the delivery of trauma care and injury prevention outreach activities. This three part series, ABCs of Trauma PI, will provide the fundamentals needed to understand the basics of a trauma program while positively reinforcing the already established components in your current PI plan.*

Event made possible through funding provided by the Health Resources and Services Administration, Office of Rural Health Policy, Medicare Rural Hospital Flexibility Program

5.75 CE credits will be offered upon completion through the Northern Arizona Area Health Education Center.



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Medical Center



## PERFORMANCE IMPROVEMENT MEASURES



**Vatsal Chikani, MPH**  
**Rogelio Martinez, MPH**  
**Mary Benkert**  
**Maureen Brophy**

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## 2013 Updates

System Goals:

1. Reduce Emergency Department (ED) dwell time at Level III/IV trauma centers before transfer to Level I trauma centers,
2. Reduce transfers after admission,
3. Reduce deaths outside of trauma centers,
4. Increase trauma billing efficiency.

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## Data sources

- ARIZONA STATE TRAUMA REGISTRY 2013
- HOSPITAL DISCHARGE DATABASE 2013

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## Performance Measure 1: Reduce ED Dwell Time

- Inclusion: Patients at Level III or IV with an ED disposition of "Transfer to acute care" AND
- Destination listed as an Arizona Level I Trauma Center or acute care facility in Nevada.
- ED Dwell time = "ED/Hospital Arrival Date/Time" - "ED Exit Date/Time"
- 2012: 18 Level IV Trauma Centers,
- 2013: 21 Level IV and 5 Level III Trauma Centers

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## ED dwell time by ISS

2012

1st Performance Measure: ED dwell time (hrs)	By Injury Severity Score							
	Overall		Missing		ISS <= 15		ISS > 15	
	N	%	N	%	N	%	N	%
<2 hours	172	21.0%	12	33.3%	132	20.3%	28	21.0%
>=2 hours	646	78.9%	24	66.6%	517	79.6%	105	78.9%
Total patients transferred	818	100.0%	36	100.0%	649	100.0%	133	100.0%

2013

1st Performance Measure: ED dwell time (hrs)	By Injury Severity Score							
	Overall		Missing		ISS <= 15		ISS > 15	
	N	%	N	%	N	%	N	%
<2 hours	243	17.4%	12	36.3%	193	17.0%	38	16.6%
>=2 hours	1,152	82.5%	21	63.6%	941	82.9%	190	83.3%
Total patients transferred	1,395	100.0%	33	100.0%	1,134	100.0%	228	100.0%

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## 2012 Level IV: ED dwell time by ISS

1st Performance Measure: ED dwell time (hrs)	Overall		Missing		ISS <= 15		ISS > 15	
	N	%	N	%	N	%	N	%
<2 hours	172	21.0%	12	33.3%	132	20.3%	28	21.0%
>=2 hours	646	78.9%	24	66.6%	517	79.6%	105	78.9%
Total patients transferred	818	100.0%	36	100.0%	649	100.0%	133	100.0%

2013

1st Performance Measure: ED dwell time (hrs)	Overall		Missing		ISS <= 15		ISS > 15	
	N	%	N	%	N	%	N	%
<2 hours	202	20.7%	10	32.2%	160	19.9%	32	22.8%
>=2 hours	772	79.2%	21	67.7%	643	80.0%	108	77.1%
Total patients transferred	974	100.0%	31	100.0%	803	100.0%	140	100.0%

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### Level III: ED dwell time by ISS

2013

1st Performance Measure: ED dwell time (hrs)	Overall		By Injury Severity Score					
	N	%	Missing	ISS <=15	ISS >15	ISS <=15	ISS >15	
<3 hours	41	9.7%	2	100.0%	33	9.6%	0	0.6%
>3 hours	390	90.2%	0	0	298	90.0%	92	93.1%
Total patients transferred	421	100.0%	2	100.0%	331	100.0%	68	100.0%

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### Distribution

2012

Median ED dwell time (hrs)	Count	25%	Median	75%	Max
Overall	782	2	3.1	4	28
By Injury Severity Score					
ISS <=15	649	2	3.2	4	28
ISS >15	133	2	2.9	4	11

2013 Overall

Median ED dwell time (hrs)	Count	25%	Median	75%	Max
Overall	1,362	2	3.4	5	21
By Injury Severity Score					
ISS <=15	1,134	2	3.4	5	21
ISS >15	228	2	3.5	5	18

2013 Level IV

Median ED dwell time (hrs)	Count	25%	Median	75%	Max
Overall	943	2	3.2	4	18
By Injury Severity Score					
ISS <=15	603	2	3.3	5	18
ISS >15	160	2	3.1	4	10

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### Performance Measure 2: Reduce transfers after admission

2012

2nd Performance Measure: Transfer after admission	N	%
Total patients	18	18/831 (2.1%)
Los (Days)		
<1 day	6	33.33%
1	5	27.77%
2	2	11.11%
3	3	16.66%
10	1	5.55%
14	1	5.55%

2013

2nd Performance Measure: Transfer after admission	N	%
Total patients	31	31/2,538 (1.2%)
Los (Days)		
<1 day	9	29.0%
1	16	51.6%
2	3	9.6%
3	2	6.4%
4	1	3.2%

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### Level IV: Reduce transfers after admission

2012

2nd Performance Measure: Transfer after admission	N	%
Total patients	18	18/831 (2.1%)
Los (Days)		
<1 day	6	33.33%
1	5	27.77%
2	2	11.11%
3	3	16.66%
10	1	5.55%
14	1	5.55%

2013

2nd Performance Measure: Transfer after admission	N	%
Total patients	15	15/1,035 (1.4%)
Los (Days)		
<1 day	4	26.6%
1	8	53.3%
2	2	13.3%
3	1	6.6%

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### Level III: Reduce transfers after admission

2nd Performance Measure: Transfer after admission	N	%
Total patients	16	16/1,503 (1.1%)
Los (Days)		
<1 day	5	31.2%
1	8	50.0%
2	1	6.2%
3	1	6.2%
4	1	6.2%

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### Performance Measure 3: Reduce deaths outside of trauma center

2012

3rd Performance Measure: Mortality at non-trauma centers	Died		Survived	
	N	%	N	%
Level I	603	2.56%	22,946	97.43%
Level IV	32	1.13%	2,799	98.86%
Non-trauma centers	196	1.33%	14,501	98.66%

2013

3rd Performance Measure: Mortality at non-trauma centers	Died		Survived	
	N	%	N	%
Level I	642	2.8%	21,833	97.1%
Level IV	17	0.7%	2,354	99.2%
Level IV	48	1.2%	3,784	98.7%
Non-trauma centers	176	1.5%	11,632	98.4%

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## Demographics

### Death at non-trauma centers by region

Region	N	%
Missing county	1	0.5%
Out of state county	9	5.0%
Southeastern	48	26.8%
Central	87	48.5%
Western	23	12.8%
Northern	10	5.6%

### Age demographics of deaths outside trauma centers

Age	N	%
Total Died	178	100.0%
<5	3	1.6%
5-14	1	0.5%
15-24	3	1.6%
25-44	14	7.8%
45-64	22	12.3%
65+	135	75.8%

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Type of Injury	N	%
TBI	50	28.0%
Other head, face, neck	17	9.5%
Vertebral column injury	10	5.6%
Torso	23	12.9%
Upper extremity	7	3.9%
Lower extremity	57	32.0%
Other & unspecified	1	0.5%
System wide & late effects	13	7.3%

### Injury demographics of deaths outside trauma centers

Source of admission	N	%
Non-Health Care Facility point of origin	166	93.2%
Clinic or Physician's Office	3	1.6%
Transfer from a Hospital (different facility)	6	3.3%
Transfer from another Health Care Facility	3	1.6%

### Admission demographics of deaths outside trauma centers

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## Performance Measure 4: Level I: Increase billing efficiency

4th Performance Measure: Billing efficiency	ASTR - Trauma Team Activation and Arrived by Ambulance	HCO # 068X Selected	Trauma Billing Efficiency Score	2012
Level I	17,946	15,613	86.9%	
				2013
4th Performance Measure: Billing efficiency	ASTR - Trauma Team Activation and Arrived by Ambulance	HCO # 068X Selected	Trauma Billing Efficiency Score	
Level I	17,296	14,622	84.5%	

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## Performance Measure 4: Level IV: Increase billing efficiency

4th Performance Measure: Billing efficiency	ASTR - Trauma Team Activation and Arrived by Ambulance	HCO # 068X Selected	Trauma Billing Efficiency Score	Level IV 2012
Level IV	1,125	675	60.00%	
				Level IV 2013
4th Performance Measure: Billing efficiency	ASTR - Trauma Team Activation and Arrived by Ambulance	HCO # 068X Selected	Trauma Billing Efficiency Score	
Aggregate Level IV	1,601	439	27.4%	

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## Level III: Increase billing efficiency

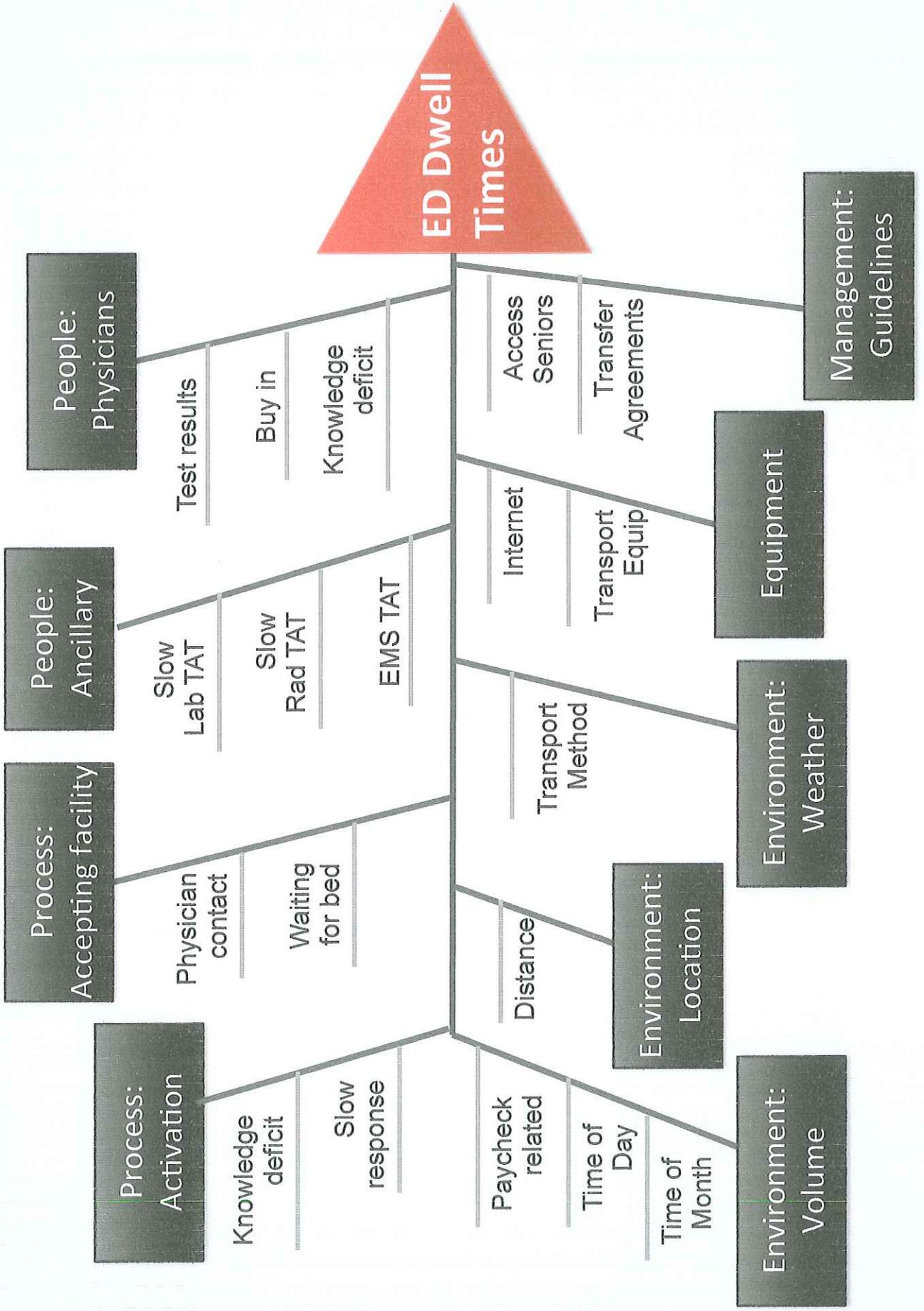
### Level III 2013

4th Performance Measure: Billing efficiency	ASTR - Trauma Team Activation and Arrived by Ambulance	HCO # 068X Selected	Trauma Billing Efficiency Score
Aggregate Level III	1,347	657	48.7%

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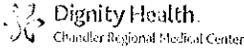


# Fishbone Diagram



## Loop Closure on opportunities for improvement related to Trauma.

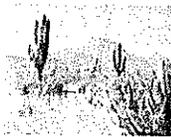
Lori Wass, MSN  
Trauma Program Manager  
November 21, 2014



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Chandler Regional Medical Center

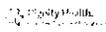
### Objectives

- Define loop closure
- Review components for loop closure
- Examples of loop closure




### Definitions

- Loop closure is defined in the Resources for Optimal Care of the Injured Patient 2006 as the demonstration that the corrective action implemented to address the particular issue that has been monitored to determine if it has had the desired effect of resolution of the problem.
- Acceptable loop closure is proof that all measures have been taken to ensure that a quality issue has been addressed satisfactorily in an effort to improve patient safety.
- Loop closure describes what you did to resolve the problem, and how you educated all those involved in the problem.



### Loop Closure

- How do I close the loop?
  - Audits
  - Education
  - Accountability
  - Re-evaluation




### Problem Solved: "Loop Closure"

- The word "loop" refers to a cycle of monitoring, finding, fixing, and monitoring again
- Has corrective action made a difference?
- Is follow up or continued monitoring needed?
- Can the loop be closed permanently or not?



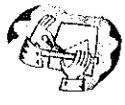
### Examples of Loop Closure

- Action Plans and Corrective Actions:
- Guideline, protocol, or pathway development and revision
- Targeted education (for example, rounds, conferences, journal clubs)
- Enhanced resources, facilities, or communication
- Counseling
- Peer review presentations
- Change in provider privileges or credentials
- External review



### Components of Loop Closure

- Action plans formulated
- Action plans implemented
- Action plans are evaluated for their effectiveness in solving the problem
- The PIPS process re-monitors
- Resolution of problem is documented
- Recurrence of problem, start over in the problem solving process

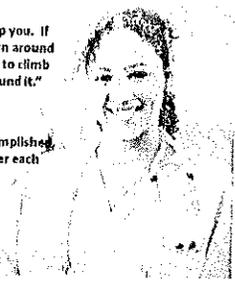


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### Some Realities to review

"Obstacles don't have to stop you. If you run into a wall, don't turn around and give up. Figure out how to climb it, go through it, or work around it."  
Michael Jordan

"Celebrate what you've accomplished, but raise the bar a little higher each time you succeed"  
Mia Hamm



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### Application of Loop Closure Related to Dwell Times

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### Dwell Times for Arizona Trauma Centers

Total Cases 282

Dwell Time	Number of Cases
2 hours or <	97
> than 2 hours	185

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### Dwell Time case study

- EMS patch
  - 65 year old male who had a fall of 15 feet; as a mechanism of injury, lower open extremity fracture .
  - Patient on Coumadin.
  - Suspected injuries include TBI
  - 120/80-120-32, O2 sat 90%, GCS 10
  - Oxygen via NRB at 15L/min with spinal stabilization



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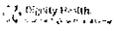
### Dwell Time case study

- ER events
  - Arrived to hospital at 1300.
  - Initial assessment reveals that patient has fracture on lower extremity open
  - CXR done and lower extremity x-rays
  - No Orthopedic Surgeon available for surgery
  - 1330 results of x-rays reported to ER Physician
  - ER Physician determines patient needs to be transferred to a higher level of care 1345
  - ER Physician contacts Level I Trauma center in Phoenix at 1350, Level I Trauma center is on divert.
  - ER Physician contacts another Level I Trauma center for transfer in Phoenix at 1405.
  - ER Physician gets a Physician to Physician report and acceptance at 1415.
  - Charge RN in ER notifies EMS patient needs transfer to higher level of care in Phoenix at 1400

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### Dwell Time case study

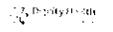
- ER events
  - Charge RN in ER notifies EMS patient needs transfer to higher level of care in Phoenix at 1410
  - EMS states they have 2 ambulances and 1 is out on a run and the other will come once the other ambulance returns, estimated time is to arrive there in 30 minutes. Estimated time is 1440.
  - 1500 EMS calls back and states they had another emergency and will keep us updated as to when they will be able to arrive at facility.
  - 1515 EMS calls and states will be there in 15 minutes.
  - 1530 EMS arrives to transfer patient to Level I Trauma Center.
  - 1545 EMS loaded patient and left facility.
  - Dwell time 2 hrs and 45 minutes



### Dwell Time case study

- Issues Identified and Questions:
  - EMS's
  - Appropriate workup
  - Decision time
  - EMS availability:
    - Call service area
    - Transportation
  - Accepting facility
- Ability to Transfer
  - Case
  - Accepting facility
  - Family approval
  - Insurance coverage
  - Method of transfer



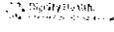


### Dwell Time case study

- Loop Closure:
  - Action Plan
    - What to look at?
    - What to monitor?
    - Processes to change?
    - Education needs?
    - Transfer agreements?



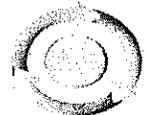
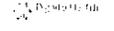
Who is going to implement the changes in the process and education and re-evaluate?



### Dwell Time case study

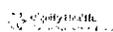
- Loop Closure:
  - Who is going to implement the changes in the process and education and re-evaluate?
  - How long will this be monitored?
  - How do we know we have closed the loop?

Include all players- ie: EMS, ED Physician, Radiology, Nursing

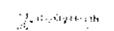
### Dwell Time case study

- Loop Closure:
  - Examples from your facilities
  - What are the barriers?
  - Who do you include?
  - Include all players- ie: EMS, ED Physician, Radiology, Nursing



### Next Steps

- Partnerships
  - AZDHS Bureau of EMS and Trauma System
  - Level I Trauma program managers and medical directors
  - Trauma Surgeons
  - Referral facilities
  - Rural trauma team

**Resources**

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- American College of Surgeons-Committee on Trauma  
<http://www.facs.org/trauma/index.html>
- Arizona Department of Health; Bureau of Emergency Medical Services and Trauma System  
<http://www.azdhs.gov/bems/trauma/index.htm>
- Trauma Systems Consultation  
<http://www.facs.org/trauma/tsepc/index.html>
- STN Trauma Outcomes & Performance Improvement Course (TOPIC) [www.traumanurses.org/topic-courses.html](http://www.traumanurses.org/topic-courses.html)
- Eastes, Lynne. Effective Loop Closure: Tips for the Trauma Program Manager. *Journal of Trauma Nursing*. 2011 January-March; vol 18.

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**Thank You**

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## Putting it All Together

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TPM St. Joseph's Hospital and Medical Center

Tiffany Strever, BSN, CEN, FAEN  
TPM West Valley Hospital

## Objectives

- Review aspects of care in case study
- Identify PI indicators in case study
- Discuss changes in practice to improve outcomes

## Case Study

- 0150 Male presents to ED by POV with slab wound
- Unknown object; minimal details
- Primary Survey
  - Airway patent
  - Respiratory effort labored
  - Bleeding controlled
  - Wound to epigastric area
    - 3-4 cm just right of sternum
  - Initial B/P 81/68

## Case Progression

- 0151 IV's started & O2 applied
- 0155 Portable chest X-ray
- 0156 Labs with T & C drawn
  - H/H 14.8/45.4
- 0201 OR team requested
- 0214 FAST was done and negative
- 0230 to OR
- Vitals remained stable after initial B/P
- 3050 cc IV fluid (no blood)

## Labs

- Lactate 7.2
- ETOH 1
- Amphetamines +
- THC +

## OR

- Laparotomy with liver laceration (cauterized)
- Diaphragm injury
- Clam shell thoracotomy
  - Ventricular laceration repair
  - Hemopericardium drained
  - Hemothorax drained
- Two chest tubes placed

### Case Progression

- Taken to PACU, extubated and sent to ICU
- Dual antibiotic coverage
- Was re-intubated in the ICU within 24 hours
- X-ray did show elevated hemidiaphragms (bilaterally)
- Noted fever and tachycardia
- Consults for cardiology and pulmonary on HD 1

### Case Progression

- Having period of hypotension (80's)
  - On Labetalol
- Renal consulted creatine 1.1 to 2.1
  - Started NS at 150cc/hr
  - May require dialysis
- HD 3 patient status worsened
  - Transferred to Level I center

### PI Issues

- What are four identified PI concerns?
- What was done well?
- What could have been done differently?

### Conclusion

- The goal of PI is to improve outcomes through change in practice



# ABC's of a Trauma Performance Improvement Plan

## Ongoing Evaluation of Performance Improvement Plan

Cecile D'Huyvetter, MSN  
*John C Lincoln North Mountain*

- Develop processes within the program that require continuous assessment and monitoring
  - Built in time lines for performance plan review
  - Routine reports of progress to trauma multidisciplinary committee & administration
  - Assures continuous improvement of your program
  - Assures preparation for the next state or ACS review

**Key to developing a sustainable PI program**

- Goals
  - Improve patient care at bedside level for improved clinical outcomes
  - Fosters competent and current providers
  - Essence of trauma program system development
  - Evaluate the cost of care
  - Reduce unnecessary variations in care
  - Prevent adverse events
- Continuous evaluation/assessment
  - Appropriateness and timeliness of care
  - Opportunities for improvement
  - Patient clinical outcomes
  - Provider response and competency
  - System performance
  - The value of care =  $\frac{\text{Quality of Process} + \text{Quality of Outcomes (ACS)}}{\text{Cost}}$

## **Performance Improvement**

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### **Review your records to identify program issues**

- Incomplete documentation
- Under-triage
- Lack of activation
- Lack of response from providers
- Use of evidenced based clinical practice guidelines

## **Building Blocks**

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## Define audit filters

- Based on industry standards (American College of Surgeons)
- State of Arizona Filters
  - EMS Scene time greater than 20 minutes
  - Facility LOS greater than 2 hours prior to transfer
- Facility issues identified from record review
  - Start with basics
    - GCS documentation
    - Physician arrival time documentation
    - Appropriate level and activation of trauma patients
    - Refer to Medical Director for clinical review

## Building Blocks

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## Develop audit review tool

- Based on audit filters defined
- Develop a process of review that clearly assigns time-line and responsibility
- Enables others to review records
  - Trauma registrar, ED nursing staff, great learning tool
- Assure capture within the registry to facilitate reporting mechanism
  - Establish custom data fields
- Smaller programs may develop Excel spreadsheets to facilitate graph production for meetings

## Building Blocks

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- Audit filters change as trauma program develops
  - Incomplete ED Documentation
  - Appropriate activation
  - Unverified intubation
  - Lack of timely physician response
  - Mortality
  - EMS scene time greater than 20 minutes
  - Over / Under triage
  - No EMS run sheet
  - Evidenced based protocol/guideline use
- Performance improvement is from scene through discharge

## **Building Blocks**

---

- Determine level of review required based on issues identified
    - Primary – Program Manager
    - Secondary – Medical Director
    - Tertiary – Trauma or Facility Multidisciplinary Committee
  - Should be delineated in trauma plan
-

- **Identify level of review**

- Incomplete ED Documentation
- Appropriate activation
- Unverified intubation
- Lack of timely physician response
- Mortality
- EMS scene time greater than 20 minutes
- Over / Under triage
- No EMS run sheet
- Evidenced based protocol/guideline use

## **Building Blocks**

---

### **Determination (judgment)**

- Consistent with facility institutional process
- System
- Provider
  - If attributed to a single provider, consider department of facility peer review process

## **Building Blocks**

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## Develop loop closure plan for identified issues or trends

*"This will never happen to another patient because....."*

- Incomplete ED Documentation ?
- Unverified intubation ?
- Lack of timely physician response ?
- Mortality ?
- EMS scene time greater than 20 minutes ?
- Over / Under triage ?
- No EMS run sheet ?

## **Building Blocks**

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## Trend to determine effectiveness of plan

- Pre and post implementation of loop closure statistics
  - Simple graph or mere percentages of process compliance is sufficient
  - Time frame?
  - Report to Trauma Multidisciplinary committee, administration
  - Repeat trending to assure positive trend is continued
    - New staff and all need a reminder from time to time or positive trend will fade
  - If goal is not met?
    - Re-evaluate plan
    - Implement new changes/education/change processes
    - Re-evaluate

## **Building Blocks**

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## **Pitt falls**

- Breaks In System – Open Issues
- No Follow Through – Loops Not Closed
  - Carry over unresolved issues on meeting agendas till complete
- Documentation and maintaining a trail
  - Through trauma registry
  - Audit tools
  - Loop closure trail clearly visible
    - Where, when, and how it was accomplished

## **On-going surveillance**

- Recommended surveillance for new programs
  - System core measures
  - Clinical core measures

## **On-going surveillance**

- **System Issues**

- Verification/designation benchmarks
    - Trauma surgeon or ED provider response to the ED
    - Appropriate trauma team activation criteria
    - If admitted, trauma service or non-surgical admission?
    - Physician response rates, based on Level and available resources
    - Over/under triage
    - Transfer to higher level of care, 2 hours state of AZ
    - Trauma Center diversion/bypass
    - Delay in operating room availability (level III), track response times
    - CT/MRI response rates
    - Trauma registry completion (80% within 2 months of discharge)
    - Multidisciplinary committee attendance by core membership
- 

- **Clinical Issues**

- Clinical effectiveness of developed protocols
- Consistent use of evidenced based protocols/guidelines by providers
- Timely delivery of care
- Multidisciplinary mortality review of all trauma deaths
  - Adjusted trauma center mortality rate (excludes DOA)
  - Mortality with opportunity for improvement rate
  - Mortality without opportunity for improvement rate

## **On-going surveillance**

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- Excellence in care provided
  - Service excellence
  - Financially sound
  - Timely, coordinated accountable care
  - Treated the way you would want to be cared for

## **Benefits of strong PI**

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### **Building**

- Step-by-step systems based preparation to care for complex critically ill patients
- Knowledge
- Equipment
- Medications
- Protocols
- personnel

## **BUILDING, MAINTAINING, EVOLVING**

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## Maintaining

- Staff Education
- Software updates
- Equipment maintenance
- Accessible protocols
- Addressing ongoing challenges in a constructive manner
- Allowing staff to multitask and problem solve without micromanagement

## **BUILDING, MAINTAINING, EVOLVING**

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## Evolving

- Formal Process Improvement
- Tie patient incidents with PI and change in protocol or system based practice
- Multidisciplinary team based approach
- Ongoing Education
- Expert to learner
- Peer to peer
- Updating protocols to follow Evidence Based Medicine
- Leadership with vision and full administrative support

## **BUILDING, MAINTAINING, EVOLVING**

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- 20 year old male shot in the chest and abdomen
- “minding his own business” by “two dudes”
- Stabilization required lung resection, exploratory laparotomy with bowel resection, splenectomy, and hepatorraphy.
- Angry mob outside of hospital. Some left the bar and walked to the hospital.
- Twitter and facebook erupts the local scene
- Sporadic reports of armed individuals roaming the hospital premises.
- ICU staff “apprehensive”

## **Case report**

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- ICU had closed electronic doors but did not have a key pad for entry or a locking mechanism
- Security was out numbered and people were slipping into different parts of the hospital
- Inexperienced staff and supervisor
- Sentinel situation
- Impending feeling of danger for patient and staff
- Altercation between family members due to escalation

## **ISSUES**

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### **Equipment/Resources**

- Installed keypad locking mechanism
- Hired onsite armed police officers that work in the ED
- Increased the number of hospital security during certain times of week, with a back up call implemented

### **Education**

- Provided lectures on de-escalation and listening to staff and administration
- Educated on the appropriateness of social networking during work
- Revisited hospital policies on hospital lockdown for dangerous situations

## **Loop Closure**

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- Created a formal lock down protocol related to trauma and the ICU
- Formalized staff interaction with the press
- Involved local law enforcement with clearing the hospital premises
- Developed an early warning system of alerting security, administration, and law enforcement for high profile violent injuries
- Administration worked on creating a safe working environment for the staff and a safe environment for the patient

## **Process improvement outcomes**

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- Develop audit filters based on national / state standards and record review
- Develop audit tool and review process that is consistent (registrar/ED staff)
- Develop tracking mechanism of identified filters or trends through registry or Excel to enable reporting and next review preparation
- Provide monthly or quarterly reports to Trauma Multidisciplinary Committee & Administration
- Assure no system breaks or loop closure failures by maintaining issues on meeting agendas till closed or resolved
- Schedule periodic review of trauma service plan and performance improvement plan, including audit filters
- Assure sustained change

## **On-going surveillance**

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- There's no blame in the performance game
- Develop as part of standard work
- With practice, all you do is seen through the eyes of performance improvement
- Trauma is generally the leader due to imposed expectations, but the remainder of the facility follows improving total care for all patients

## **Take home**

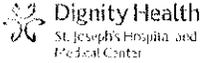
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## **On –going evaluation**

Using Trauma Registry Data for Injury Prevention: What a novel idea!

Pam Goslar, Ph.D.  
Injury Epidemiologist



Dignity Health  
St. Joseph's Hospital and  
Medical Center

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Plan for today:

- THE BASICS
- REQUIREMENTS
- PROCESS: Registry data → Prevention Focus
  - Identifying top injuries
  - Digging deeper
  - Disseminate
  - Finding evidence based programs
- QUESTIONS, ANSWERS, AND TIPS



Dignity Health  
St. Joseph's Hospital and  
Medical Center

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**BASICS**

- 1854 - SIR JOHN SNOW – Epidemiology and Prevention
- 1922 - Committee on Fractures formed by the American College of Surgeons (ACS)
- 1985 - National Research Council and the Institute of Medicine (IOM) recognized the need for a coordinated effort to prevent injuries in the United States. They identified CDC as the federal agency best suited to lead injury research
- 1989 - Surgeon General C. Everett Koop before a U.S. Senate committee - "If some infectious disease came along that affected children in the proportion that injuries do, there would be a huge public outcry and we would be told to spare no expense to find a cure and be quick about it."
- 1997 - IOM's Committee on Injury Prevention and Control recommended that no one agency could effectively serve as the sole leader for injury. Rather, it recommended that agencies should collaborate on injury prevention and control activities, with each agency leading in its area of expertise.



Dignity Health  
St. Joseph's Hospital and  
Medical Center

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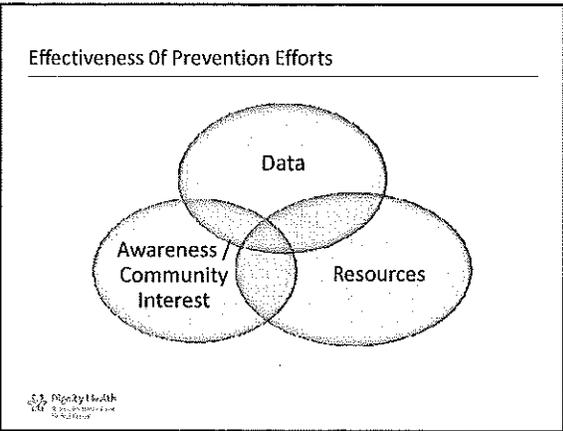
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- ACS Requirements
- Organized and effective approach to injury prevention prioritized on local trauma registry and epidemiologic data
  - Responsibility of *all* trauma team members working in *collaboration* with the community – But with effective leadership (Varies for Level I vs. Levels II, III, IV)
  - Identify the three most common causes of injury or traumatic death at the trauma center or in the community including contributing / risk factors
- In the bottom-left corner of the list area, there is a small logo for 'Dignity Health' with the text 'A HealthPartners Company' and 'www.dignityhealth.org'.

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- KEY ELEMENTS OF AN EFFECTIVE INJURY PREVENTION PROGRAM (Ch. 18 – Table 1)
- Target the Community
  - Work upstream
  - Choose preexisting proved or promising programs
  - Always partner with other organizations
  - Embrace the media
  - Be politically savvy
  - DO NOT FORGET THE DATA
- In the bottom-left corner of the list area, there is a small logo for 'Dignity Health' with the text 'A HealthPartners Company' and 'www.dignityhealth.org'.

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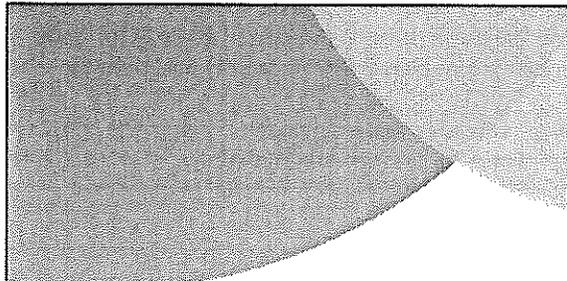
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**Data review –  
SJHMC Example**  
TRAUMA REGISTRY 2009-2013



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**POTENTIAL FOCUS OF PREVENTION  
PROJECTS**

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- **MECHANISM OF INJURY**
  - CDC'S E-CODE MATRIX



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**POTENTIAL FOCUS OF PREVENTION  
PROJECTS**

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- **MECHANISM OF INJURY**
  - CDC'S E-CODE MATRIX
- **TYPE OF INJURY**
  - TBI / SCI
  - ORTHOPEDIC
- **ROOT CAUSES / RISK FACTORS**
  - ALCOHOL AND/OR DRUGS
  - AGE CATEGORIES



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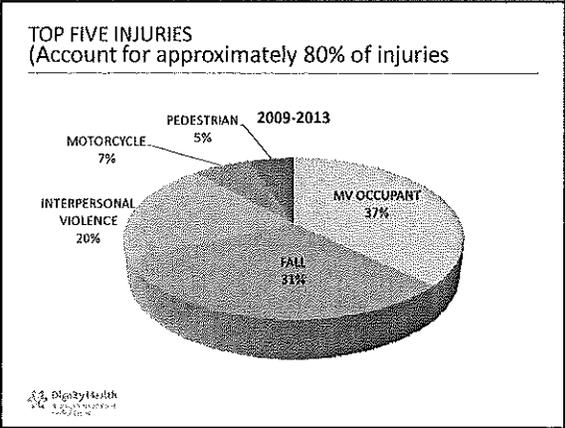
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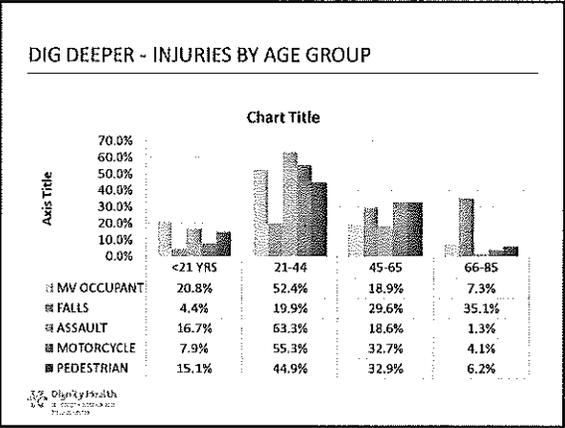
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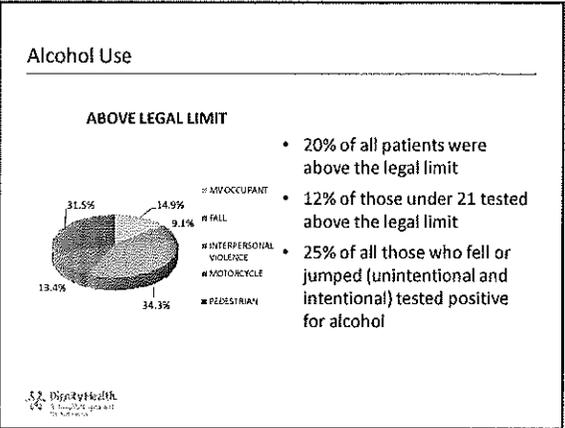
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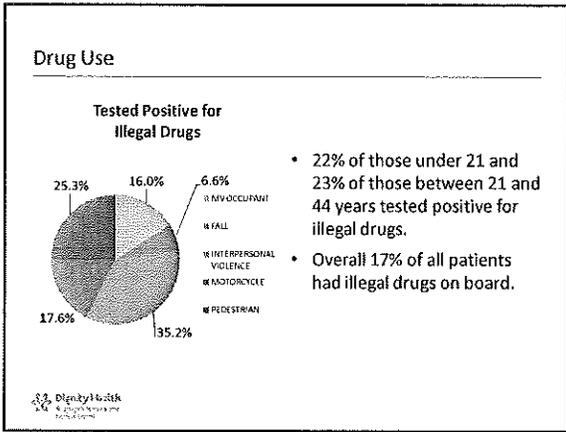
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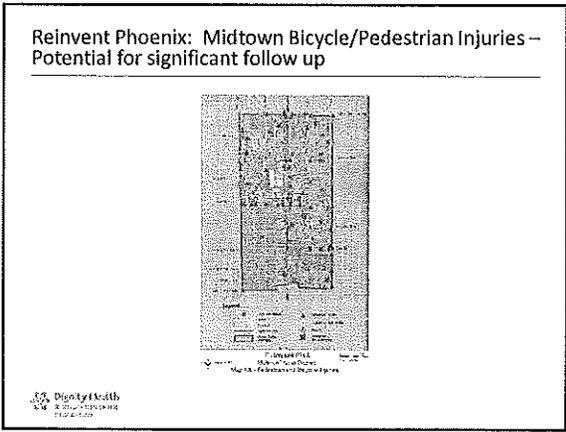
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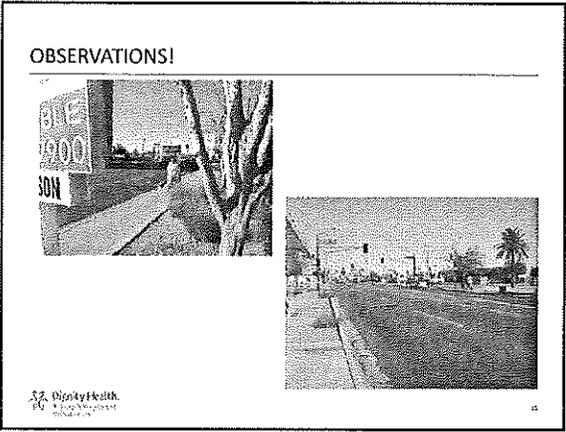
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**OTHER DATA SOURCES TO CONSIDER:**

- Vital Records
- Arizona Department of Health Services Injury Surveillance and Prevention Plan
- State ASTR Trauma Reports
- Local Law Enforcement Data
- Collision data – State and Local
- Surveys

Arizona Department of Health Services

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**RESOURCES – FIND EVIDENCE BASED PROGRAMS**

- ACS – Injury Prevention & Control Website - <https://www.facs.org/quality-programs/trauma/ipc/home>
- Centers for Disease Control – Injury & Violence Prevention – <http://www.cdc.gov/injury/>
- Safe Kids – World Wide - <http://www.safekids.org/coalition/safe-kids-arizona>
- Injury Free Coalition for Kids - <http://www.injuryfree.org/>
- National Highway Traffic Safety Administration - <http://www.nhtsa.gov/>
- Substance Abuse and Mental Health Services Administration - <http://www.samhsa.gov/prevention>

Arizona Department of Health Services

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**OTHER RESOURCES, PROGRAMS, ORGANIZATIONS**

- THINK FIRST FOUNDATION
- ARIZONA FALL PREVENTION COALITION
- ARIZONA BRAIN INJURY ASSOCIATION
- GOVERNOR’S COUNCIL ON SPINAL AND HEAD INJURIES

Arizona Department of Health Services

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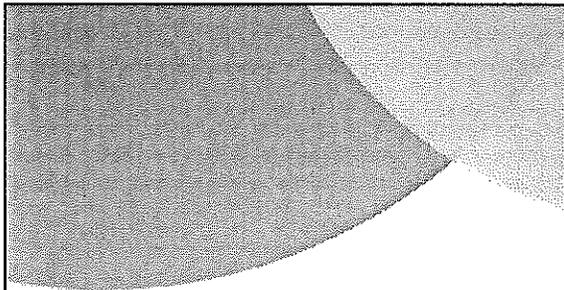
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**CURRENT PROJECTS –  
SJHMC TRAUMA**

SJ DignityHealth  
SACRAMENTO  
2014

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**Boot Camp for New Dads**

- National Program – Evidence based
  - Increases involvement of father's
  - Prevention of Domestic Violence and Child Maltreatment
  - Post-partum Depression
- Monthly workshop facilitated by David Villa and Jeff Gibson with Veteran Dads and their babies as guest "coaches"

SJ DignityHealth  
SACRAMENTO  
2014

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**Arizona Firearm Injury Prevention Coalition**

- Provides firearm safety materials on-line, through schools, and presentations
- Produced video "Four Guns" [www.afipc.org](http://www.afipc.org)
- Gun turn in program (not buy back)
- Safety trainings for health educators and others
- Provides free gun locks

SJ DignityHealth  
SACRAMENTO  
2014

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**Wheelchair / Mobility Scooter Injury Prevention**

- In collaboration with the City of Phoenix Streets Department
- Currently developing data set of reported collisions in Phoenix
- Literature review – specifically for evidence based program
- Potential funding identified.



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**Alcohol / Drug Related Prevention Projects**

- Wake Up! Youth Program
- Alcohol Screening & Brief Intervention Program
- Developing materials / media for underage drinking
- Developing materials/media for older adults and alcohol
- Increasing referral capabilities by making personal contacts relative to intake.
- Potential – Expansion to include drugs



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**New or Exploratory**

- National Violent Death Reporting System participation – grant received by ASU –CVP&CS: Participation on Advisory Council
- Law enforcement Protective Equipment
  - Informal interviews with law enforcement regarding use of "armor"
  - Potential survey through PLEA
  - Establish task force to develop and implement project
- Seat Belt Use – Obesity / Pregnancy



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**TRAUMA PROJECTS SPECIAL CONSIDERATIONS & TIPS**

- COMBINATION OF INJURY PREVENTION, EPIDEMIOLOGY AND CHRONIC DISEASE EXPERTISE
- DON'T WANT TO RE-INVENT THE WHEEL, OR DUPLICATE EFFORTS
- STRONG INTEREST IN PREVENTION AROUND CHILDREN (FUNDING OFTEN EASIER TO OBTAIN)
- EVALUATION IMPORTANT, BUT OFTEN DIFFICULT – BE CREATIVE
- HAVE STUDENTS? RESIDENTS? - USE THEM



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**Q & A**



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**Thank You**



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## Trauma Event Tracking Form

### System Factors (N)

- EMR
- PulseCheck
- Registration
- Schedules
- Resource availability
- Equipment issue
- Hand-off
- Multiple casualty incident
- Inadequate/absent policy or PMG
- Diversion

#### Referral process:

- Incorrect service/consultation
- TRN not notified
- 71 Gun not utilized
- Incorrect transfer team

#### TTA:

- Short notification
- Page confusing
- Incomplete page

### Human Factors (N)

#### **Practitioner factors**

- Practitioner skill-based-failure in execution of 'preprogrammed' & stored instructions or routine tasks
- Practitioner rule-based- failure in retrieval & usage of stored instructions or performing familiar tasks
- Practitioner knowledge-based-failure due to resources limitation (e.g. insufficient time), and incorrect or incomplete knowledge
- Negligence-failure to perform at the level of competence consistent with professional norms of practice and operation
- Recklessness-Intentional deviation from professional norms of good practice and operation without cause
- Intentional rule violations-Knowingly violates a rule or procedure
- Practitioner fatigue
- Practitioner unclassifiable

#### **Patient Factors**

- Uncooperative/Non-compliance
- Left against medical advice
- Left without being seen
- Left before treatment completed
- Family issues

#### **Determination**

- Unanticipated Mortality with Opportunity for Improvement
- Anticipated Mortality with Opportunity for Improvement
- Mortality without Opportunity for Improvement
- Delay in Diagnosis
- Error in Diagnosis
- Error in Judgment
- Error in Technique
- System Issue
- Inadequate Protocol
- Communication Issue
- Other Error Identified--Specify

- Patient Disease
- No Error

#### **Action Plan**

- Track and trend
- Develop PMG/policy
- Education
- Peer review committee
- Strategic Plan
- Hospital/System PI
- Other

Signature:

Date:

### Trauma Event Tracking Form

Date of report:	Medical record No:	Admit Date:
Nature of event:	Date:	Time:
Patient Name:	Age:	Gender:
Diagnosis:		
Level of Activation:		
Other Pertinent Information:		Report completed by:

#### Impact (v)

<b>Physical</b> <input type="checkbox"/> No harm <input type="checkbox"/> No detectable harm <input type="checkbox"/> Potential for harm <input type="checkbox"/> Mild temporary harm <input type="checkbox"/> Mild permanent harm <input type="checkbox"/> Moderate temporary harm <input type="checkbox"/> Moderate permanent harm <input type="checkbox"/> Severe temporary harm <input type="checkbox"/> Severe permanent harm <input type="checkbox"/> Death	<b>Psychological</b> <input type="checkbox"/> No harm <input type="checkbox"/> No detectable harm <input type="checkbox"/> Mild temporary harm <input type="checkbox"/> Mild permanent harm <input type="checkbox"/> Moderate temporary harm <input type="checkbox"/> Moderate permanent harm <input type="checkbox"/> Severe temporary harm <input type="checkbox"/> Severe permanent harm <input type="checkbox"/> Profound mental harm	<b>Legal</b> <input type="checkbox"/> Legal department contacted <input type="checkbox"/> Complaint registered w/ Patient Affairs <input type="checkbox"/> Potential legal risk <b>Socioeconomic</b> <input type="checkbox"/> Delayed disposition <input type="checkbox"/> Unnecessary hospital admission <input type="checkbox"/> Unnecessary EMS/Air transport <input type="checkbox"/> Unnecessary procedure <input type="checkbox"/> Unnecessary treatment <input type="checkbox"/> Behavioral issue
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#### Type (v)

<b>Communication</b> <input type="checkbox"/> Inaccurate or incomplete information <input type="checkbox"/> Questionable advice or interpretation <input type="checkbox"/> Questionable consent process <input type="checkbox"/> Questionable disclosure process <input type="checkbox"/> Questionable documentation	<b>Patient Management</b> <input type="checkbox"/> Delegation of care or tasks <input type="checkbox"/> Patient follow-up <input type="checkbox"/> Consultation or referral <input type="checkbox"/> Resource utilization
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<b>Clinical Performance</b> <u>Pre-Interventional:</u> <input type="checkbox"/> Correct diagnosis, questionable intervention <input type="checkbox"/> Inaccurate diagnosis <input type="checkbox"/> Incomplete diagnosis	<u>Interventional:</u> <input type="checkbox"/> Correct procedure with complications <input type="checkbox"/> Correct procedure, incorrectly performed <input type="checkbox"/> Correct procedure but untimely <input type="checkbox"/> Omission of essential procedure <input type="checkbox"/> Procedure contraindicated <input type="checkbox"/> Procedure not indicated	<u>Post-Interventional:</u> <input type="checkbox"/> Unexpected outcome <input type="checkbox"/> Inadequate post-procedural instructions <input type="checkbox"/> Inadequate home-going instructions
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#### Domain (v)

<b>Setting</b> <input type="checkbox"/> Scene <input type="checkbox"/> Transport <input type="checkbox"/> Transferring facility <input type="checkbox"/> ED <input type="checkbox"/> Radiology <input type="checkbox"/> IR <input type="checkbox"/> OR <input type="checkbox"/> PACU <input type="checkbox"/> ICU <input type="checkbox"/> PCU <input type="checkbox"/> Floor <input type="checkbox"/> Clinic	<b>Phase</b> <input type="checkbox"/> Evaluation <input type="checkbox"/> Resuscitation <input type="checkbox"/> Acute Care <input type="checkbox"/> Post discharge	<b>Time</b> <input type="checkbox"/> Weekday <input type="checkbox"/> Weekend/Holiday <input type="checkbox"/> Day <input type="checkbox"/> Night <input type="checkbox"/> Shift change <input type="checkbox"/> Code yellow/orange
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#### Domain (v) - continued

<b>Staff Providers:</b> <input type="checkbox"/> Trauma consultant <input type="checkbox"/> Fellow <input type="checkbox"/> Resident <input type="checkbox"/> PA /NP <input type="checkbox"/> EM consultant <input type="checkbox"/> ICU <input type="checkbox"/> Ophthalmology <input type="checkbox"/> NS <input type="checkbox"/> Spine <input type="checkbox"/> EP consultant <input type="checkbox"/> Radiology	<input type="checkbox"/> Outside provider <input type="checkbox"/> PM&R <input type="checkbox"/> Anesthesia	<b>Nurses:</b> <input type="checkbox"/> Nursing assistant/PCA <input type="checkbox"/> Licensed practical nurse <input type="checkbox"/> Registered nurse <input type="checkbox"/> Float Staff	<b>Therapists:</b> <input type="checkbox"/> Physical therapist <input type="checkbox"/> Occupational therapist <input type="checkbox"/> Respiratory Therapist <input type="checkbox"/> Speech Therapist	<b>Others:</b> <input type="checkbox"/> Pharmacist <input type="checkbox"/> X-ray technician <input type="checkbox"/> Lab <input type="checkbox"/> Cath Team <input type="checkbox"/> Infusion Therapy
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