Door-to-Drug in Obstetrics

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Disclosures

- None of the authors have any COI to disclose
- Melanie Chichester, BSN RNC-OB CPLC
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Background

Door-to-drug is a critical part of sepsis standard of care.

"Key recommendations and suggestions…
early quantitative resuscitation of the septic patient
during the first 6 hrs after recognition (1C)…
administration of broad-spectrum antimicrobials therapy
within 1 hr of recognition of septic shock (1B)
and severe sepsis without septic shock"

(Dellinger RP, Levy MM, Rhodes A, et al., 2012)

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Background

The concept of "door-to-drug" or "door-to-balloon" times as standard of care for care of acute STEMI are well known.

"Potential delay during the in-hospital evaluation period may occur from door to data, from data to decision, and from decision to drug.

These 4 major points if in-hospital therapy are commonly referred to as the '4 D's.' "
(American Heart Association, 2011)

Background

The American College of Cardiology/American Heart Association recommend reperfusion therapy for patients with STEMI within 90 minutes of arrival for care.

The smaller the delay from presentation to intervention, the better the outcomes. (Parikh, Jacobi, Chu, Addo, Warner, Delaney, et al., 2008)

Background

In addition to evaluating door-to-treatment time, Bradley, et al., (2006) looked at subintervals and the process of evaluation(data), decision, and treatment (drug) to achieve guideline-based care for patients with STEMI

(Bradley, Herrin, Wang, McNamara, Raford, Magid, et al., 2006)

Background

We propose using the same concept to review opportunities for improvement in "door-to-drug" for obstetrical patients.

A woman with a high risk of delivering prematurely should receive betamethasone (or appropriate alternative) at least 48 hours prior to delivery if she is between 24-34 weeks gestation in order to improve neonatal outcomes.

-reduction in the risk of Respiratory Distress Syndrome

-reduction in mortality

-reduction in Intrarventricular hemorrhage (ACOG, 2011)

Background

Both the delivery and duration of drug administration of antenatal corticosteroids have been shown to positively improve neonatal outcomes.

The decision to use antenatal corticosteroids should not be altered by fetal race or gender or by the availability of surfactant replacement therapy

"Further research regarding the risks and benefits, optimal dose, and timing of a single rescue course of steroid treatment is needed." (ACOG, 2011)

Background

At our facility, only 61% of eligible women using the ACOG definition were appropriately receiving antenatal steroids prior to delivery.

Women who are candidates for this therapy
may have a delay in presentation (door), decision for treatment, and initiation of care (drug) based on a variety of variables.

There can be critical time subinterval variations
which affect timely care for these patients
where there is potential for improvement.

This warrants further investigation
in order to improve door-to-drug time
regardless of day or time of arrival.

Purpose

To examine both maternal and system issues that may be associated with delayed delivery (door-to-drug) of antenatal corticosteroids.

Methods

This was a retrospective cohort study of obstetric patients at a tertiary care level suburban teaching hospital with ~6500 deliveries/year.

Women were included who were evaluated in our OB Triage unit and ultimately delivered less than 34 0/7 weeks gestation in 2011 & 2013.

Our primary outcome was time of presentation to drug delivery (Door-to-drug Interval [DDI]).

Secondary outcomes were identifying opportunities for improvement in subintervals, as well as other factors which could contribute to DDI delays

Methods

The charts were reviewed for time of arrival (door), time of evaluation (data), time of admission (decision), and time of medication administration (drug).

Other patient demographics/clinical characteristics were explored for confounding variables.

Analysis was performed using univariate analysis and cox proportional hazard.

A second review and analysis was done of women in 2013 after relocation of the steroids to the OB Triage Dept.

Results

A total of 87 women were identified in 2011 and 70 were identified in 2013.

Mean DDI times were calculated and logistic regression was used to determine factors associated with longer times.

The mean door-to-drug time for 2011 was 195.49 minutes and 180.73 minutes in 2013 ($p = 0.22$, NS).

There was no significant improvement in achieved DDI by placing the steroids in the OB Triage dept.

Results: 2011 versus 2013

Demographic Variable	2011 N = 87	2013 N = 70	Value
Maternal Age	28.6 ± 6.5	28.0 ± 6.5	0.29, NS
Ethnicity			
--% White	37.8%	50.0%	0.36, NS
--% Black	47.2%	40.6%	
-- % Hispanic	9.2%	5.7%	
-- % Asian	5.7%	2.9%	
-- % Other	--	1.5%	
Insurance			
-- % Self	24.1%	20.0%	0.25, NS
-- % Private	36.8%	31.4%	
-- % Medicaid	39.1%	48.6%	
Provider			
-- % Service	35.6%	40.0%	0.57, NS
-- % Private	64.4%	60.0%	
Language			
-- % English	93.1%	95.7%	0.28, NS
-- % Non English	6.9%	4.3%	

Results: 2011 versus 2013

Demographic Variable	2011 N = 87	2013 N = 70	P Value
Gestation @ Delivery (wks)	30.8 ± 2.7	31.0 ± 3.0	0.32, NS
Gravida	2.87 ± 2.14	2.73 ± 1.90	0.33, NS
Para	1.06 + 2.14	1.0 + 1.24	0.39, NS
Significant Medical History			
-- % No / % Yes	51.7% / 48.3%	44.2% / 55.8%	NS
Preterm Labor			
-- % No / % Yes	45.9% / 54.1%	82.8% / 17.2%	NS
Premature/Prolonged ROM			
-- % No / % Yes	63.2% / 36.8 %	82.8% / 17.2%	NS
Met Steroids Standard			
-- % No / % Yes	31% / 69%	31.4% / 68.6%	NS
Weekday / Weekend Evaluation	79.9 % / 20.1%	74.3% / 25.7%	NS
Days/ Nights Evaluation	57.4% / 42.6%	67.1 % / 32.9%	NS
Arrival-to-Exam Time (min)	70.47 ± 58.3	70.14 ± 44.06	0.97, NS
Exam-to-Admit Time (min)	53.9 ± 62.6	43.86 ± 74.64	0.19, NS
Admit-to-1st Steroids Time (min)	65.6 ± 50.3	65.6 ± 103.3	0.50, NS
Door-to-Drug Time (min)	195.49 ± 125.37	180.73 ± 109.3	0.22, NS

Results

No maternal demographics, including ethnicity, gravidity, parity, admission diagnosis, or gestational age altered DDI.

Similarly, system factors such as time of day and day of week did not effect DDI.

Moving the steroids to the OB Triage area
did not significantly reduce the DDI.

Conclusions

There is no standard door-to-drug time for administration of antepartum steroids.

We offer the above data as a starting point to stimulate discussion of an appropriate time frame in which steroids should be administered.

Conclusions

Though door-to-drug delivery interval is an important outcome, it does not appear to be affected by demographics or system factors in a traditional research sense.

- -This demonstrates parity in care administration
- -We were pleased to note no disparities in care, either based on demographics or day/time of care

However, in both time periods 31% of women did not receive steroids in time to receive optimum benefit for the fetus.

Implications for Research

Future research should seek a larger sample and explore further variables.

- This only included those who did deliver prior to 37 weeks gestation (preterm). We could gather a larger number of subjects by including all preterm women who present for care who were then admitted and given steroids, even if they ultimately carried to term.
- We also only looked at whether the women received a full course of steroids, whereas we could add whether they received any steroids, as there is some benefit from only one dose

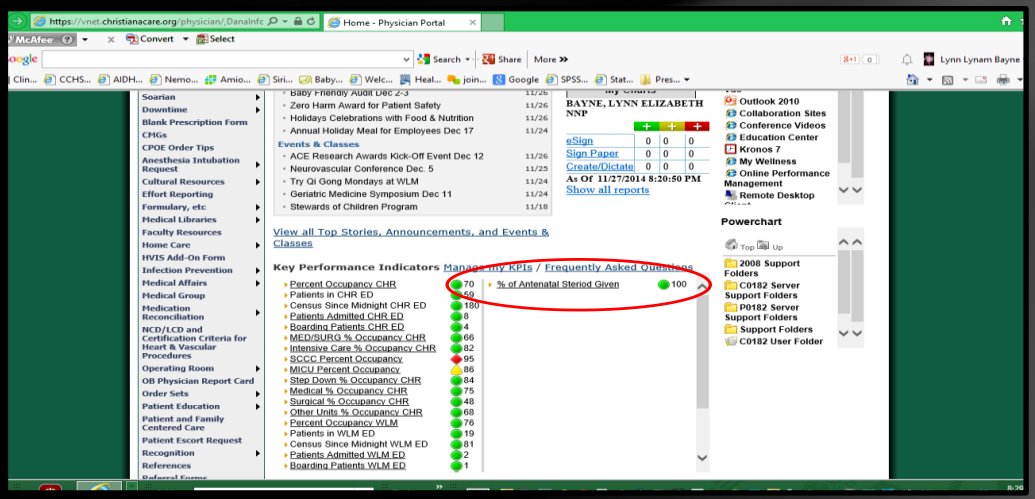
Further data which should be explored includes the time from onset of symptoms to presentation for care, perhaps investigating surveying the women regarding factors which may cause them to delay seeking care.

Implications for Research

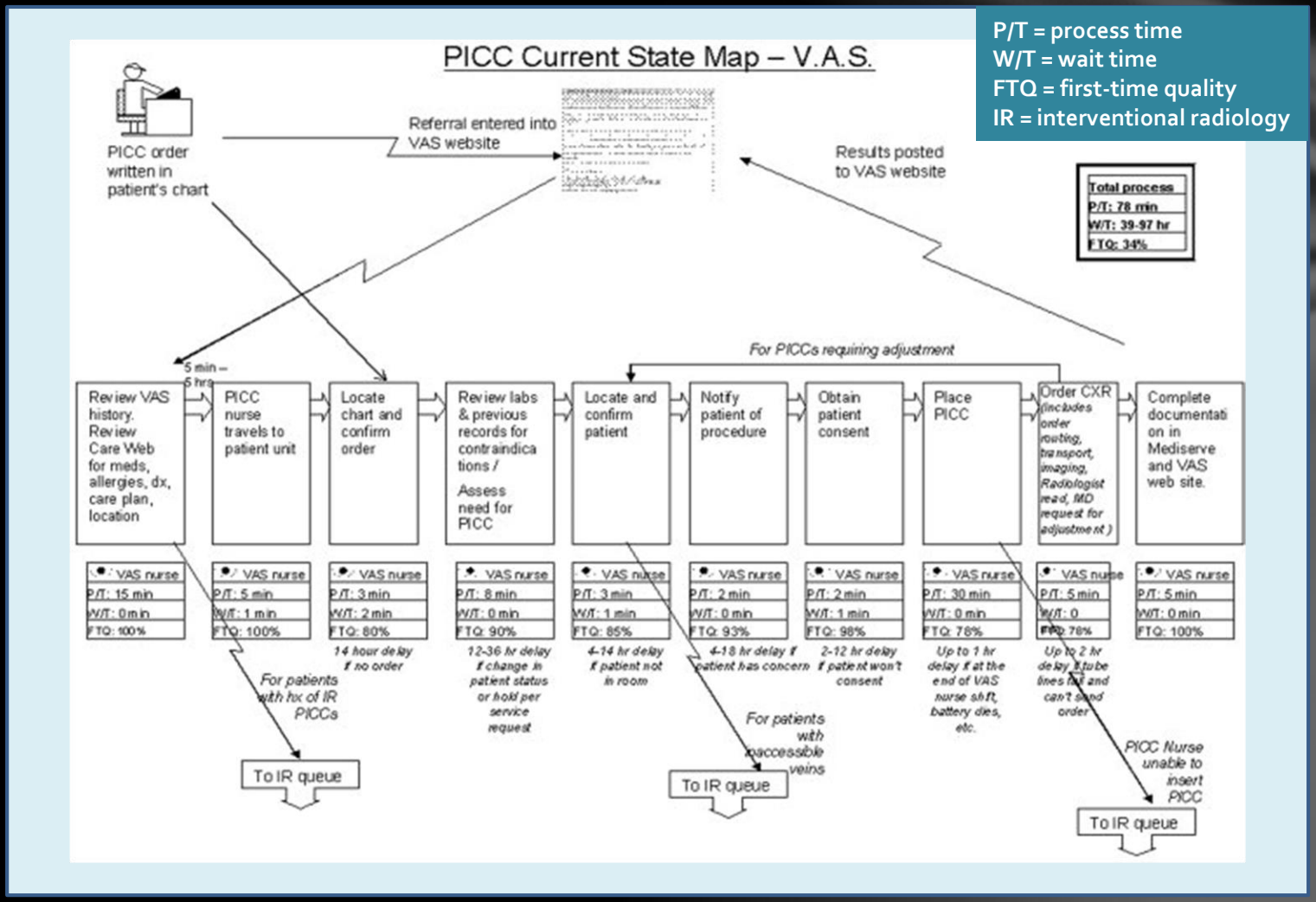
Consideration of an early warning system
similar to heart, stroke, or sepsis alerts
or care algorithm adjustments
could improve compliance with drug delivery
to eligible mothers and to shorten the DDI.

Alternatively, the next step approach might be to use this
information as a baseline and apply quality improvement,
lean/six sigma methods such as value stream mapping
or process mapping to reach target goal of 100% administration.

Next Step: Process Mapping or …

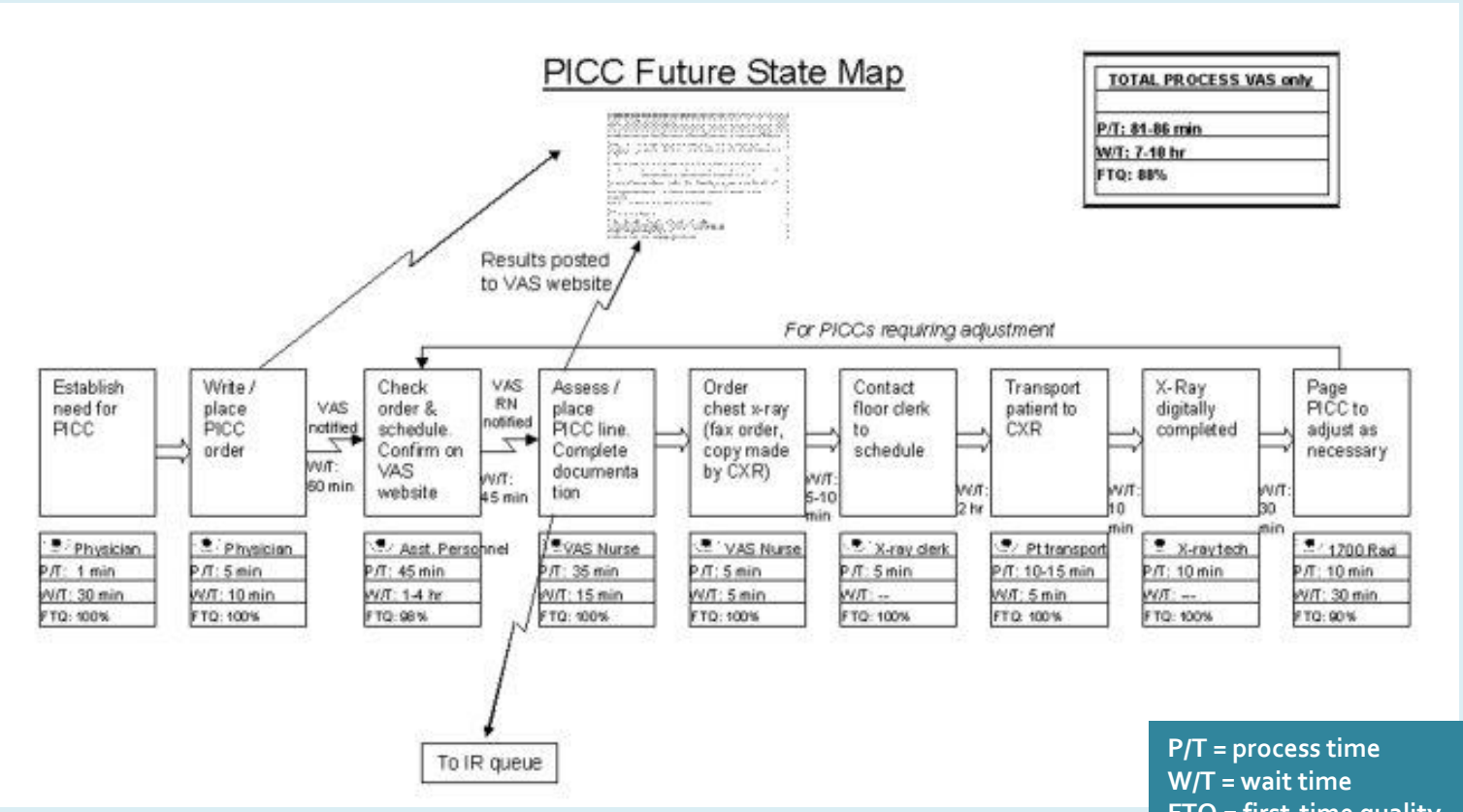


Value Stream Mapping of the DDI Process—Current State



Journal of Hospital Medicine, 2006

Value Stream Mapping of the DDI Process—Future State



P/T = process time
W/T = wait time
FTQ = first-time quality
IR = interventional radiology

Journal of Hospital Medicine, 2006

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Questions?

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Thank you!