

Testimony

Submitted on behalf of the University of Pittsburgh Medical Center

Before the

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Presented by

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Chairman Erickson and Members of the Senate Public Health and Welfare Committee, I am Jeannine Konzier, RN, BSN, M.Ed., Director, Center for Quality Improvement and Innovation, University of Pittsburgh Medical Center (UPMC).

Patient safety is paramount at UPMC. I believe that UPMC has been instrumental in making patients at our own hospitals and hospitals throughout southwestern Pennsylvania safer. We have done this by taking a leadership role in patient safety and have worked collaboratively with thirty two other hospitals in our community to reduce the rate of hospital acquired infections across the entire region. Our results are very significant.

I am here today to talk about some of the successes that we have found after implementing programs to ensure that preventative measures would be consistently followed. Three of our most effective and widely referenced programs include those to reduce central-line associated blood-stream infections (CLABs), methicillin resistant Staphylococcus aureus (MRSA) and Clostridium difficile (CD) colitis. Many quality improvement initiatives are initially successful, but achieving sustained effects is more difficult. By questioning the limits of what is achievable, we have raised the bar on quality improvement.

CLABs - 80,000 CLABs occur annually with a crude mortality approaching 40%. Our CLAB initiative began in FY03. Our healthcare leaders have been enormously committed providing resources, support and leverage. UPMC is the leading health system in western PA and one of the largest nonprofit integrated health systems in the United States. UPMC's consortium of health care facilities includes 20 tertiary care, specialty, and community hospitals, 15 being general acute adult hospitals (GAAH) ranging in size from 59 to 1108 beds with 308 licensed ICU beds. A multidisciplinary team was convened at each facility that included change agents, opinion leaders, and champions. Readiness for change was assessed and baseline CLAB data was collected across all ICUs. The program consists of implementing a CLAB "bundle":

- 1) A standard procedure note requiring documentation of barriers and antiseptic used
- 2) Mandatory CLAB education (<https://cme.health.pitt.edu/index.asp?MI=000011>)
- 3) Chlorhexidine gluconate (CHG) for skin antisepsis
- 4) The option to use a CHG/Silver sulfadiazine coated central venous catheter (CVC)
- 5) Use of 5 maximal barrier precautions (MBP) which consists of a large drape, sterile gown, sterile gloves, mask with face shield and hat
- 6) **Real-time feedback of data to clinicians and health-care leadership**
- 7) **Resources, Support, Leverage**

Kits were developed to "bundle" all necessary supplies and conveniently placed in all areas where central venous catheters are stored. Data on outcomes and process measures were collected monthly, analyzed and reviewed by clinicians and healthcare leaders, including CEOs and Boards of Directors.

After 1 year, the HS CLAB rate decreased by 71.4% to 1.2/1000 CL days (See Attachment A). All unit types demonstrated decreased rates. This rate is well below the CDC 25th percentile. This Quality Improvement Initiative has been ongoing for over 3 years. In FY06, the rate further decreased to 0.7/1,000 CL days. This rate is well below the CDC 10th percentile. This initiative

prevented over 450 CLABs, saved 158 lives and was associated with a cost saving of greater than \$4 million.

MRSA - MRSA HAIs increase patient length of stay, costs, and mortality. One ICU in our hospital was reporting increased MRSA infections. This is a 28-bed medical ICU. In 2001 they had a 29% increase of MRSA HAIs (35.3/10,000 PT days vs. 27.3 for 2000). Hospital wide, 63% of all clinical *S. aureus* isolates were MRSA. In November 2001, the MICU implemented an MRSA "bundle". The bundle consisted of:

1. Performing active screening to identify MRSA colonized patients
2. The consistent use hand hygiene and of barrier precautions
3. Real-time reporting of newly identified cases
4. Clean or dedicated equipment
5. Enhanced environmental cleaning
6. **Real-time feedback of data to clinicians and health-care leadership**
7. **Resources, Support, Leverage**

Screening was done on all MICU admissions, discharges and during the high risk stay. On average, 1200 screening cultures were obtained annually on admission. Overall 11.4% patients were identified as MRSA colonized on admission. Identifying and isolating MRSA colonized patients, in addition to infected ones, has resulted in a **90.3%** MICU MRSA HAI rate reduction (3.7/10,000 PT days for 2004 vs. 38.2/10,000 PT days for 2001, OR 10.4, 95% CI 3.0-43.0, $p = 4.6 \times 10^{-6}$), (See Attachment B). This low rate was maintained through today. Clinical cultures alone would have only identified about 25% of this cohort allowing further transmission of MRSA. This MRSA initiative was then expanded to the CTICU, another very high-risk area and beginning in FY06 to all ICUs across our health system. This initiative prevented 68 MRSA infections, saved 33 lives, and overall was associated with a cost avoidance of \$2.4 million.

Clostridium difficile (CD) - CD significantly impacts patient outcome and costs. In June, 2000, CD hospital acquired infection (HAI) rate peaked at 10.4/1000 discharges at UPMC-PUH and the annual 2000 rate was significantly higher than the rate in 1999 (7.2 vs 2.7). This increase was associated with increased colectomies and deaths. A multidisciplinary approach was taken and a CD "bundle" was implemented. The CD bundle consisted of:

1. Consistent use of hand hygiene with soap and water
2. Barrier precautions
3. enhanced cleaning with bleach
4. Increased case finding methodologies/ early identification/early appropriate treatment
5. Target antibiotic restriction
6. **Real-time feedback of data to clinicians and health-care leadership**
7. **Resources, Support, Leverage**

Ongoing control measures began in 2000. Today, severe CD associated outcomes have now been reported worldwide. A novel CD strain has been identified that has a genetic mutation that makes this strain more deadly than older strains.

Overall, the CD HAI rate decreased significantly from 7.2/1000 discharges to 4.7 ($p=0.005$), (See Attachment C). We did find this new strain in our hospital in 2000 and by 2001, 40% of our

isolates were of this type. In 2005, only 13% of the isolates were the "bad" strain and of these, only 2 isolates (20%) were hospital acquired. Compared to 2001, a significant reduction in both the overall incidence and the incidence of the bad strain was observed ($p < 0.0001$).

In conclusion, our results illustrate that by taking a leadership role in patient safety we can reduce the rate of hospital acquired infections. We appreciate the opportunity to present our quality improvement initiatives to the Committee and look forward to working with you to continue to improve upon our results.

Attachment A

Table 1		Baseline 1/02 – 6/02	FY 03	FY 04	FY 05	FY 06
	Goals NNIS 25 th percentile	CLABs/CL days (Rate)	CLABs/CL days (Rate)	CLABs/CL days (Rate)	CLABs/CL days (Rate)	CLABs/CL days (Rate)
Med/Surg	1.9	8/3,372 (2.4)	9/5,954 (1.5)	5/5,381 (0.9)	2/6,254 (0.3)	5/7,047 (0.7)
Surgical	2.5	28/5,027 (5.6)	54/9,782 (5.5)	17/8,704 (2.0)	17/12,543 (1.4)	14/14,783 (0.9)
CT	1.5	16/4,771 (3.4)	33/9,399 (3.5)	10/9,650 (1.0)	14/11,060 (1.3)	8/10,456 (0.8)
CCU	1.9	9/1,975 (4.6)	21/4,500 (4.7)	3/2,158 (1.4)	2/2,435 (0.8)	5/2,236 (2.2)
Med	3.4	16/2,942 (5.4)	14/6,296 (2.2)	3/5,387 (0.6)	8/8,489 (0.9)	10/11,413 (0.9)
Trauma	5.0	5/976 (5.1)	12/2,031 (5.9)	4/4,952 (0.8)	2/4,799 (0.4)	1/5,621 (0.2)
Neurosurg	2.5	7/1,847 (3.8)	13/3,503 (3.7)	6/3,530 (1.7)	4/3,829 (1.0)	3/4,584 (0.7)
Med/Surg teaching	3.2	10/2,503 (4.0)	14/4,063 (3.4)	7/7,296 (1.0)	2/4,155 (0.5)	0/5,376 (0)
Total	NA	99/23,413 (4.2)	170/45,528 (3.7)	55/47,058 (1.2)	51/53,564 (1.0)	46/61,516 (0.7)
Process Measures C						
	Goal	Baseline period	FY03	FY 04	FY 05	FY 06
Use of all 5 MBP	70%	NC	2,364/5,966 (39.6%)	10,318/11,640 (88.6%)	12,993/13,641 (95.2)*	14,164/14,543 (97.4%)*
*P value <0.05			**NC = Not Collected			

Attachment B - ICU MRSA HAI Rates

	2002	2003	2004	2005
BSI Rate	7.3	2.2	0	1.2
SSI Rate	0	0	0	0
PNEU Rate	22.0	17.3	4.4	1.2
Other Rate	8.8	7.6	1.1	1.2
Tot Rate*	38.2	27	5.5	3.7

Attachment C - CD Rates

Year	CD rates				
	# CD HAIs	DCs	CD Rate* (/1,000 DCs)	Pt-days	CD Rate /10,000 pt days
1996	89	28,453	3.1	192,243	4.6
1997	97	27,622	3.5	163,329	5.9
1998	76	28,552	2.7	164,120	4.6
1999	72	27,029	2.7	157,099	4.6
2000	214	29,757	7.2	183,540	11.7
2001	179	31,864	5.6	191,874	10.7
2002	161	31,930	5.0	198,770	10.2
2003	164	31,837	5.2	196,824	8.3
2004	148	32,182	4.6	205,095	7.2
2005	188	34,067	5.5	211,883	8.9
2006*	66	19,605	3.4	127,337	5.2