“Real World” Experience with Preventing BSIs

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Objectives:

- *Discuss the advantages of a collaborative approach to preventing BSI in dialysis patient*
- *Identify facility challenges and obstacles to making changes in the dialysis setting*
- *Describe the outcomes after implementation through a collaborative approach of an EBP project*

Brief History

- Jan. 2008: Started Tracking Catheter Infection Rates. Averaged 4 patients per month with sepsis from catheter infections
- May 2008: New procedure and product implemented to clean the ports of the catheters prior to accessing the lines.
- June 2008-Oct 2008: No BSI. Thought we had figured it out!
- Nov. 2008: We started having a catheter associated BSI’s and or exit site infections every month.

- Jan. 2009: Re-educated staff on Catheter Care using CDC recommendations.
- Strict aseptic technique was reviewed
- All staff began wearing facemask while doing Catheter care.
- Changed Procedure and Product to clean Catheter Exit Site.

Moving Forward

- 2009: Continued to have either a catheter associated BSI or exit site infection every month thru July 2009!

Time to shake things up!

Joined the CDC Dialysis Collaboration

- Joined the Collaborative July 2009
- Great opportunity to network with other units with similar circumstances

Benefits of Joining the Collaborative

- Have the opportunity to network with other members through in-person meetings and monthly collaborative calls to discuss infection prevention topics

- Get input on specific challenges to prevention from dialysis and BSI prevention experts

- Gain familiarity with analysis of NHSN data for their dialysis center and receive support for NHSN use and infection measurement from experts at CDC

- Describe collaborative efforts at regional and national meetings and serve as role models for others

- Have support from experts in implementation science. Easier to get staff buy-in!

Collaborative process

Facilities will work together to develop a package of interventions to prevent BSI
Each facility will then work to implement the interventions in their facility
Each facility will track the number of BSIs using a national CDC surveillance system (NHSN) to see what happens to these infections over time
Facilities will also keep track of how well staff are using the prevention interventions

Proposed Core Interventions for CDC/Dialysis Collaborative

1. **Surveillance for Positive Blood Cultures, Antimicrobial Starts, and Hospitalizations Using NHSN –**

   Conduct Monthly Surveillance for Dialysis Events and Enter Events Into NHSN. CDC Will Provide Facility Rates and Comparisons to Other Facilities. Facilities Should Actively Share Results With Front-line Providers.

2. Chlorhexidine for Skin Antisepsis – Use chlorhexidine (2% or Greater) As the First Line Agent for Skin Antisepsis. Povidone-iodine, Preferably With Alcohol, Is an Alternative.

3. Hand Hygiene Surveillance – Perform Monthly Hand Hygiene Audits With Feedback of Results.

4. Catheter care/ access observations –

Perform monthly audits of catheter care and accessing practices to ensure adherence to facility guidelines. This may include use of a mask while connecting and disconnecting catheters and during dressing changes.

5. Patient Education/engagement –

Provide Standardized, Basic Education to All Patients Including (but Not Limited To) Care of Vascular Access, Hand Hygiene, Cleansing Vascular Access, and Instructions for Access Management When Away From the Dialysis Unit.

6. Staff education and competency – Provide regular training for staff on infection control topics, including care of access and aseptic technique. Perform evaluation of competency for skills such as catheter care and accessing at least yearly and upon hire.

7. Catheter reduction – Incorporate efforts within the facility (e.g., patient education) to reduce catheters by identifying barriers to permanent vascular access placement and catheter removal.

Supplemental Intervention:

1. Antimicrobial ointments or Chlorhexidine-impregnated dressings –

Apply bacitracin/gramicidin/polymixin B ointment or povidone-iodine ointment to catheter exit sites during dressing change OR use a chlorhexidine-impregnated dressing. Facilities are strongly encouraged to select one of these interventions to implement. Facilities that choose not to implement one of these interventions initially should reassess their rates and consider using it on all patients with catheters should rates not reach collaborative targets following the implementation of the core interventions.

Opportunity for Research Project

- We had been collecting data for about 18 month
- Encouragement from hospital to have a research project
- Decided to turn this ongoing problem into a “Evidence Based Research” project

Research Title

Correlation between change of dialysis catheter preparation and infection rates

Purpose

To reduce the number of catheter infections in the dialysis unit. The dialysis unit has been working on reducing the catheter infection rate for the last 2 years, and continue to have catheter infections.

Getting Started

Unit shared governance

- Shared decision making
- All staff have a voice
- Group brainstorming
- Shared responsibility

Educate and Practice

Emphasize Consistency

- Builds confidence in patients
- Reduces Variation
- Forms a habit

Put it in writing

Dialysis Initiation and Q-Syte change with a Catheter

Set Out 4 pairs of gloves
Set up Clean Field
Put on mask,(pt. and self) shield and gloves
Put outside wrap on Patient
Remove old dressings
Remove gloves/wash/re-glove
Open sterile towel and place under catheter
Clean exit site with chloraprep back & forth motion
Repeat chloraprep cleaning is necessary
Assess exit site*
Cleanse catheter from exit site to bifurcation with alcohol
Allow chloraprep at exit site to completely air dry
(use outside wrap for garbage)
Apply ointment and Dress Exit site

***Assess exit site for:**
- **Drainage**
- **Soreness**
- **Catheter placement**

Scrub catheter hubs with alcohol for approx. 15 sec.
Cleanse catheter from hub to bifurcation with alcohol pad
Pull out old heparin/blood form ports
Put in sharps container if open or on outside wrap
Draw labs if needed
Instill Heparin Bolus
Remove gloves/wash/chart
Wait 2-3 minutes for heparin to circulate
Glove, hook up patient
Remove gloves/wash/re-glove
Wipe stethoscope and machine off.
Settle patient
Remove gloves. Wash hands. Finish charting.

****Pt. Hook up includes:**
- **Connecting pt.**
- **Securing lines**
- **Working machine up to prescription**
- **Flipping dialyzer**

At end of Treatment (Mon. and Tues.)
Make sure catheter clamps are clamped
Remove one Q-Syte and hold catheter end. Do not set down!!
Open chloraprep pad and wipe across end of open catheter end
Using same chloraprep pad, scrub threads of catheter end
Allow chloraprep to completely dry (approx. 1 min.)
Place new Q-Syte on catheter end
Repeat for second lumen.
Install Heparin flush into each lumen

Encourage staff to use “cheat sheets”

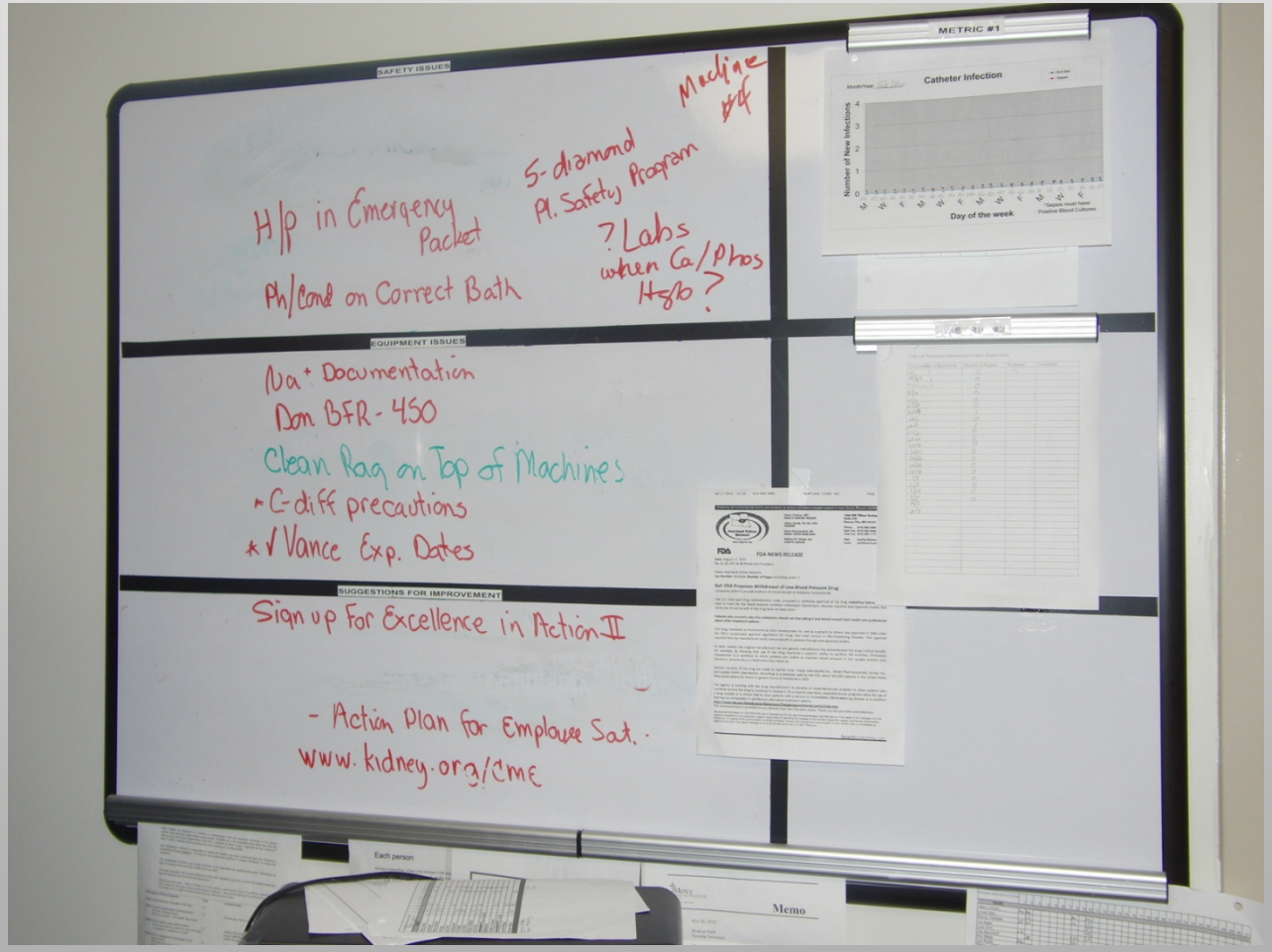
Observe and Critique

Catheter Care Observations
Observer:_____

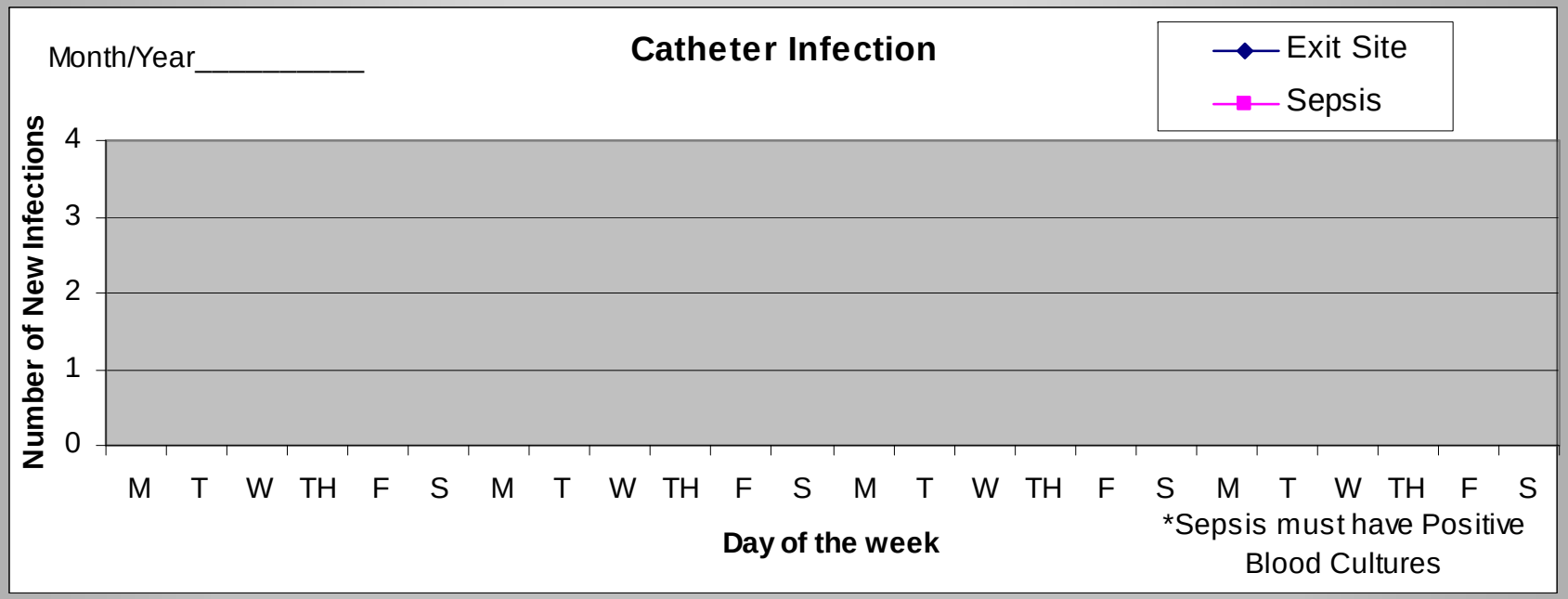
1.Set Out 4 pairs of gloves
2. Set up Clean Field
3. Moisten 2x2's
4. Put on masks (2), shield and gloves
5. Put outside wrap on Patient
6. Remove old dressings
7. Remove gloves/wash/re-glove
8. Open sterile towel and place under catheter
9. Clean exit site with chloraprep inside-out
10. Allow exit site to dry and apply ointment.
11. Cleanse Q-sytes with alcohol swab
12. Cleanse catheter with alcohol swab
13. Pull out old heparin/blood
14. Install prescribed heparin
15. Put in sharps container if open or on outside wrap
16. Remove gloves/wash/chart
17. Wait 3-5 minutes for heparin to circulate
18. Glove, hook up patient (Pt. Hook up includes)
•Connecting pt. and secure lines
•Working machine up to prescription
•Flipping dialyzer
19. Remove gloves/wash/re-glove
20. Wipe stethoscope and machine off.
21. Settle patient
22. Remove gloves. Wash hands. Finish charting.

Date/Staff	Date/Staff	Date/Staff	Date/Staff
1.			
2.			
3.			
4.			
5.			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17A			
B			
C			
18			
19			
20			
21			
22			

Monitor Results Daily



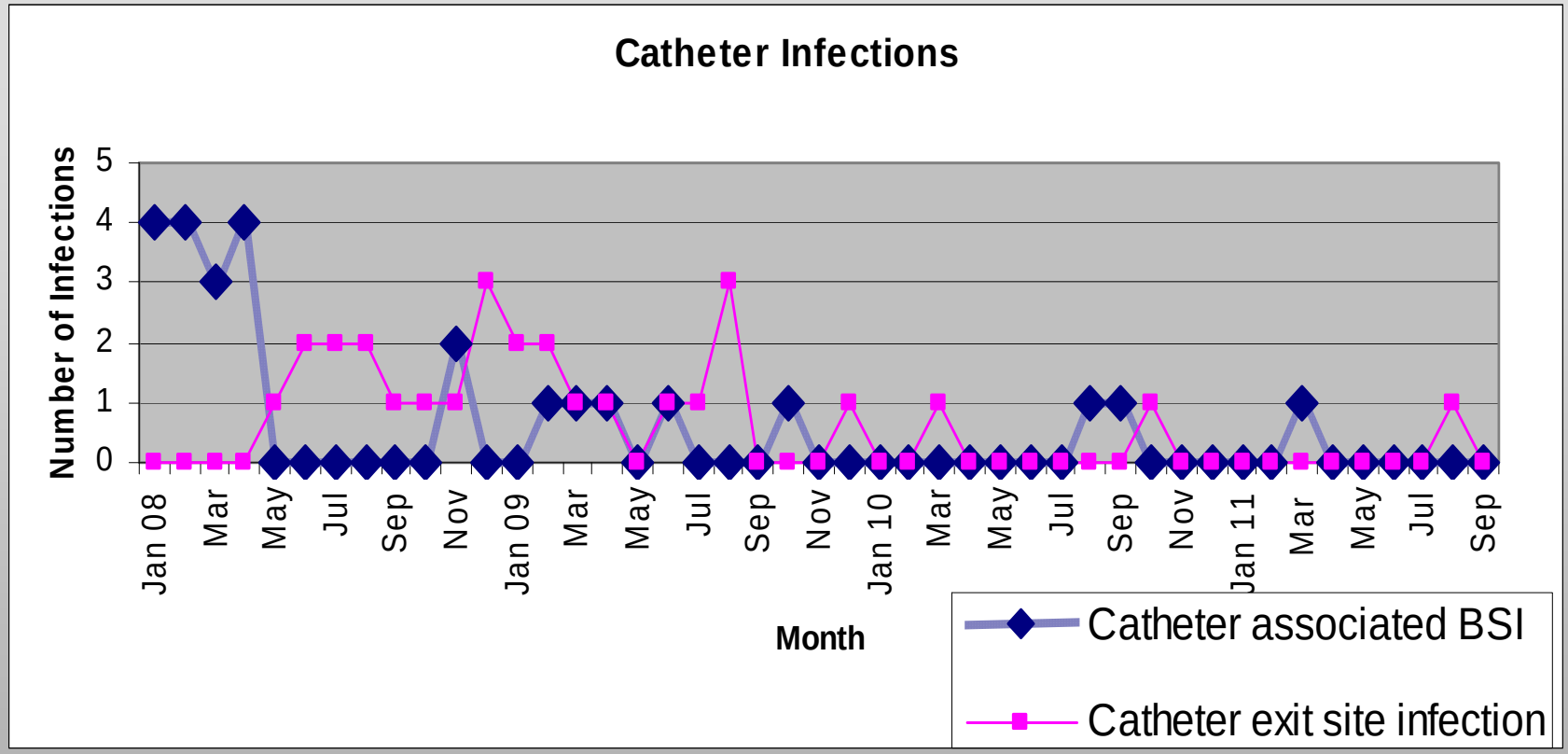
Monitor results Daily



Positive Results

- 2008 data: 17 Catheter related BSI and 9 catheter exit site infections
- 2009 data: 4 Catheter related BSI and 14 catheter exit site infections
- 2010 data: 2 Catheter related BSI and 2 catheter exit site infections
- 2011 data to date: 1 Catheter related BSA and 1 exit site infection.

Results


Catheter Infections
Number of Infections
5
4
3
2
1
0
Jan 08
Mar
May
Jul
Sep
Nov
Jan 09
Mar
May
Jul
Sep
Nov
Jan 10
Mar
May
Jul
Sep
Nov
Jan 11
Mar
May
Jul
Sep
Month
Catheter associated BSI
Catheter exit site infection

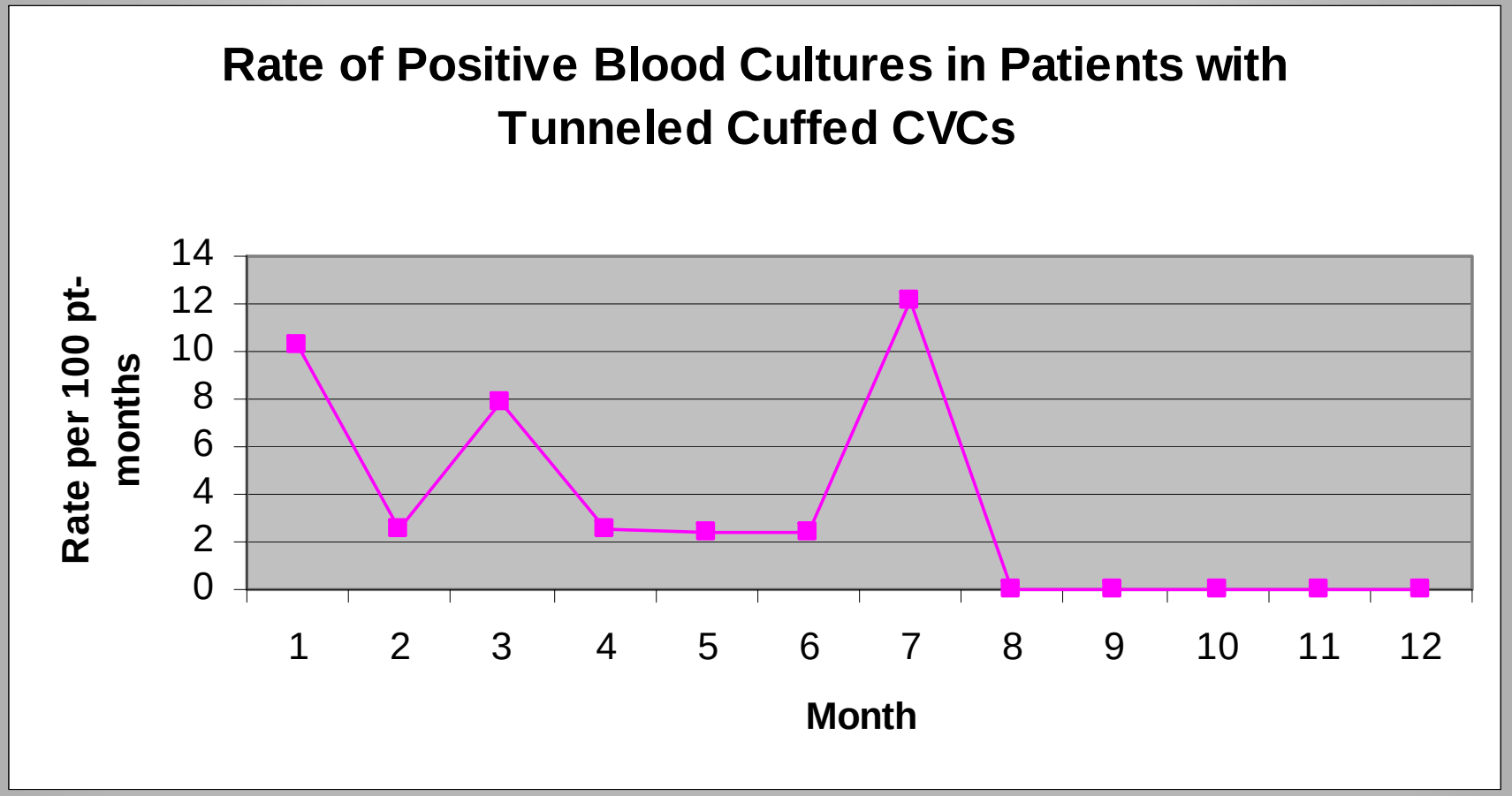
Sustaining Results

- Monthly hand hygiene surveillance
- Practices with “dummy” yearly at Skills Validation
- Periodic observation of catheter care
- Continue daily monitoring of catheter infections

Sustaining Results

- Continue to work with CDC dialysis collaboration to keep updated on new products or best practices
- Ongoing Patient education
- Being very aggressive with “Fistula First”
- Report monthly to NHSN and give staff feedback

Examples of NHSN Report



Examples of NHSN Report

Rate Table for Vascular Access Infection

accessType	summaryYR	months	vaiCount	numPats	VAIRate	VAI_Mean	IDR_pval	IDR_pctl
All	2010	12	4	699	0.6	.	.	.
Fistula	2010	12	0	536	0.0	0.4	0.0963	25
Graft	2010	12	0	62	0.0	0.9	0.5732	25
PermCentral Line	2010	12	4	101	4.0	4.8	0.4731	54

CDC Prevention Collaborative Surveillance Data Report

Pooled mean rates of events per 100 patient-months

	2009 Facility Pooled Mean	2009 Collaborative Pooled Mean	2007-2008 NHSN Facility Pooled Mean
All BSI	0.61	1.30	-
BSI			
AV Fistula	0.73	0.75	0.68
AV Graft	0.00	0.42	1.14
Tunneled CVC	0.50	3.10	3.93
All CVC	0.50	2.95	-
IV Antibiotic Start			
AV Fistula	4.65	3.02	2.19
AV Graft	9.43	2.76	2.64
Tunneled CVC	9.05	8.58	6.26
All CVC	9.05	8.24	-
Hospitalization			
AV Fistula	12.47	9.63	7.36
AV Graft	7.55	9.44	10.30
Tunneled CVC	10.55	14.32	13.52
All CVC	10.55	14.26	-

Fistula First Rate

Month/Year	% using AVF	% with AVF
Jan 2008	63%	78%
Jan 2009	70%	81%
Jan 2010	68%	80%
Jan 2011	79%	83%

Lessons Learned

- Use all the resources that are out there
- Learn from others
- Don’t hesitate to join a group. The extra effort is well worth it
- Don’t let up
- Be visible
- Educate! Educate! and Re-Educate!

In Closing

- Hard work pays off
- Great feeling to be part of creating “best practices”
- Joining the CDC dialysis collaboration has been very informative, helpful and even fun
- Our work with the collaborative is ongoing
- Everyone wins when we work together

Resources

Visit the Web Site for valuable information

http://www.cdc.gov/dialysis/collaborative/

NHSN

Dialysis Event Surveillance

CMS ESRD QIP Proposed Rule

- **In July 2011, CMS proposed an ESRD Quality Incentive Program (QIP) rule**
  - Potential to affect 5,304 dialysis facilities
- **Part of the proposed rule is to incentivize reporting to NHSN**
- **Finalized rule released November 2011**
- **According to the rule, dialysis facilities should be enrolled in NHSN and report three consecutive months of data in the calendar year 2012.**

National Healthcare Safety Network

- NHSN is the National Healthcare Safety Network
- It is a secure, internet-based surveillance system
- Public Health Surveillance is the ongoing, systematic collection, analysis, interpretation, and dissemination of data regarding health-related events for use in public health action to reduce morbidity and mortality and improve health

Why perform dialysis surveillance?

- **Surveillance requires the use of specific instructions and definitions so that data are collected uniformly**

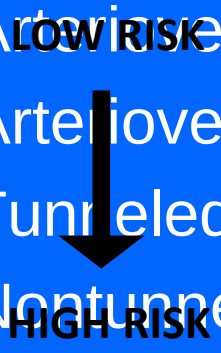
- **This allows dialysis facilities to:**
  - Make meaningful comparisons
    - between facilities (aggregated)
    - within the facility (over time)
  - Evaluate interventions
  - Identify problems
  - Engage staff by providing regular & consistent feedback

Why perform dialysis surveillance?

- **In 2008, more than 350,000 patients were treated with chronic hemodialysis in the U.S.**
- **Bloodstream infections and localized vascular access infections cause substantial morbidity**
  - Often involve drug-resistant bacteria
- **Need to identify and implement best practices for dialysis**
  - Requires data for evaluation

Infection Risk by Vascular Access

Risk of infection varies by vascular access type:



Arteriovenous fistulas

Arteriovenous grafts

Tunneled central lines

Nontunneled central lines

NHSN data are stratified by vascular access type.

Practical Experience with CDC Dialysis Event Surveillance

- Busy London dialysis unit with 112 patients implemented CDC dialysis surveillance
- Described their experience for an 18 month data collection period
- After the initial set up, surveillance required 2 hours per month

George A, Tokars JI, Clutterbuck EJ, et al. Reducing dialysis associated bacteraemia, and recommendations for surveillance in the United Kingdom: prospective study. BMJ 2006; 332:1435-1439.

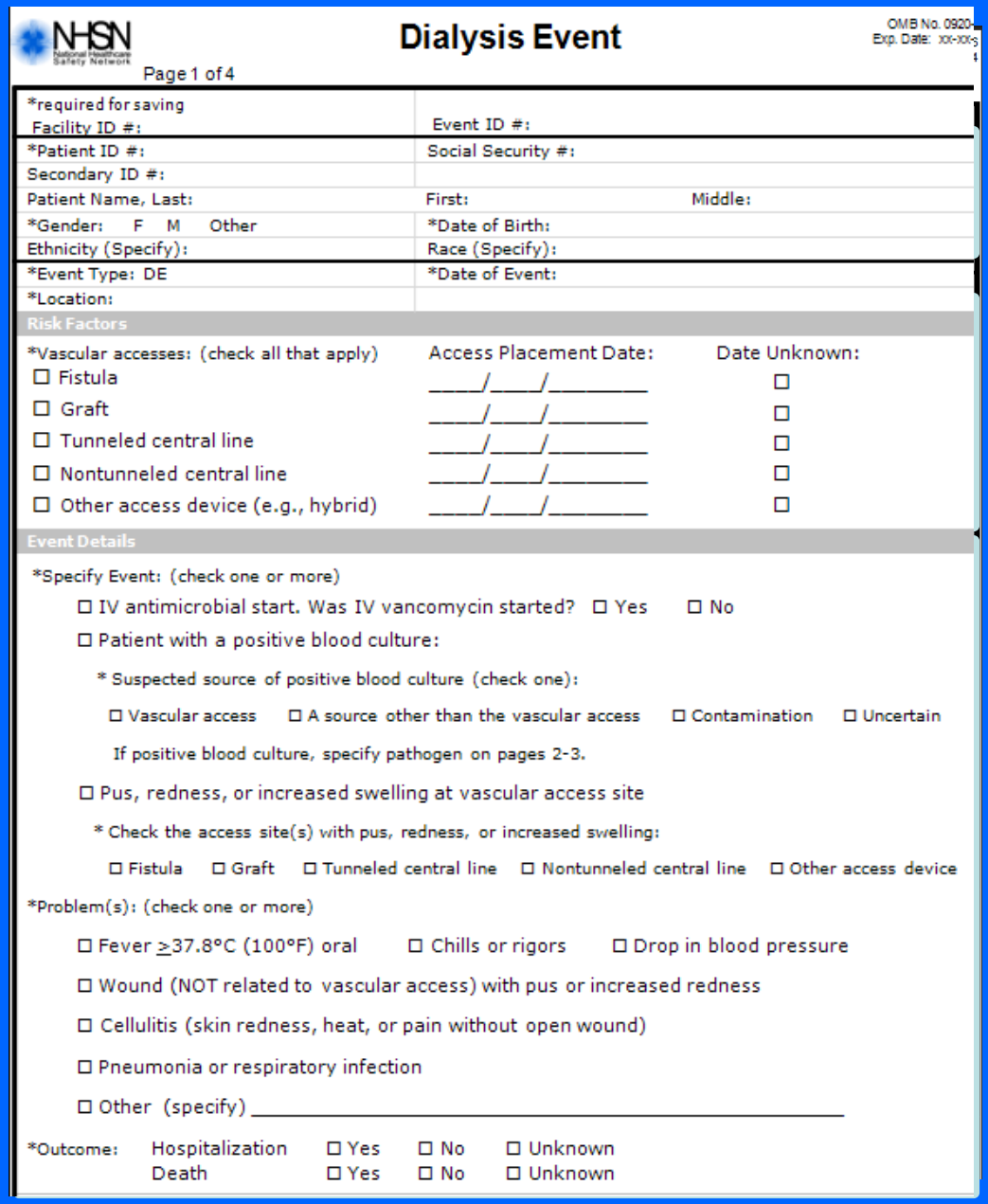
Surveillance Outcomes Reported

- **Dialysis unit reported reductions in:**
  - Access-related bloodstream infections
  - Antibiotic usage
  - Hospital admissions
- **These reductions occurred simply by doing surveillance and providing feedback to staff**
- **There were no other interventions!**

George A, Tokars JI, Clutterbuck EJ, et al. Reducing dialysis associated bacteraemia, and recommendations for surveillance in the United Kingdom: prospective study. BMJ 2006; 332:1435-1439.

Dialysis Event Form

- Patient demographics
- Risk Factors
- Dialysis Event type(s) & details
- Problems/ symptoms
- Outcomes



NHSN National Healthcare Safety Network

Dialysis Event

OMB No. 0920-
Exp. Date: xx-xx-x

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*required for saving Facility ID #:	Event ID #:
*Patient ID #:	Social Security #:
Secondary ID #:	
Patient Name, Last:	First: Middle:
*Gender: F M Other	*Date of Birth:
Ethnicity (Specify):	Race (Specify):
*Event Type: DE	*Date of Event:
*Location:	

Risk Factors

*Vascular accesses: (check all that apply)	Access Placement Date:	Date Unknown:
☐ Fistula	____/____/_____	☐
☐ Graft	____/____/_____	☐
☐ Tunneled central line	____/____/_____	☐
☐ Nontunneled central line	____/____/_____	☐
☐ Other access device (e.g., hybrid)	____/____/_____	☐

Event Details

*Specify Event: (check one or more)

☐ IV antimicrobial start. Was IV vancomycin started? ☐ Yes ☐ No

☐ Patient with a positive blood culture:

* Suspected source of positive blood culture (check one):

☐ Vascular access ☐ A source other than the vascular access ☐ Contamination ☐ Uncertain

If positive blood culture, specify pathogen on pages 2-3.

☐ Pus, redness, or increased swelling at vascular access site

* Check the access site(s) with pus, redness, or increased swelling:

☐ Fistula ☐ Graft ☐ Tunneled central line ☐ Nontunneled central line ☐ Other access device

*Problem(s): (check one or more)

☐ Fever ≥37.8°C (100°F) oral ☐ Chills or rigors ☐ Drop in blood pressure

☐ Wound (NOT related to vascular access) with pus or increased redness

☐ Cellulitis (skin redness, heat, or pain without open wound)

☐ Pneumonia or respiratory infection

☐ Other (specify) _____

*Outcome:				
	Hospitalization	☐ Yes	☐ No	☐ Unknown
	Death	☐ Yes	☐ No	☐ Unknown

Acting on the Data

- **Get the most benefit by acting on the data**
- **Recognize areas for improvement**
  - Suggestion: look at your rates for BSI, do any vascular access types have higher rates than expected?
  - Set measurable goals
- **Provide feedback to frontline staff**
  - Inspire staff engagement in preventing vascular access infections
- **Continue NHSN surveillance, monitor for changes in performance**

Summary

- **NHSN Surveillance**
  - Secure internet based surveillance system
  - Outpatient dialysis facilities use the ‘Dialysis Event’ module
  - Benefits of participation: ultimately improve patient outcomes

- **CMS ESRD QIP proposed rule incentivizes Dialysis Event reporting for 3 or more months in 2012**

Summary

- **NHSN Enrollment**
  - Complete training before starting 5 step process, includes:
    - Getting a digital certificate to access the Secure Data Network
    - Submitting a dialysis center practices survey
    - Getting facility leadership to consent to participation
- **Resources for NHSN Enrollment and Reporting**
  - Dialysis Event website http://www.cdc.gov/nhsn/psc_da_de.html
  - NHSN Helpdesk nhsn@cdc.gov
  - Some ESRD Networks and State Health Departments

Next Steps – If Planning to Enroll in NHSN

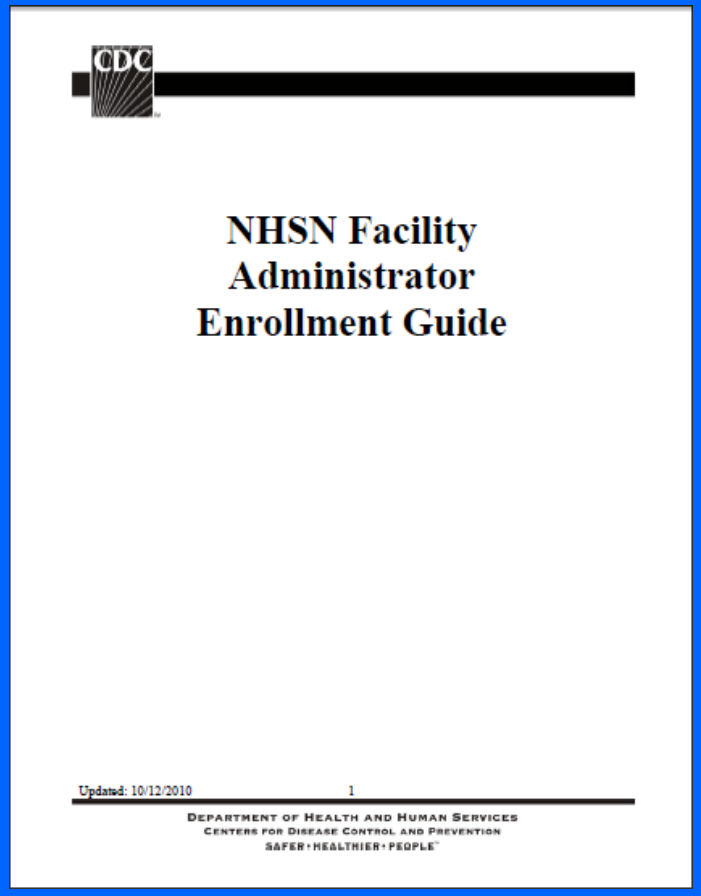
- **Print and begin the Outpatient Dialysis Center Practices Survey**
  - Available under "Essential Forms" on the Dialysis Event website: http://www.cdc.gov/nhsn/psc_da_de.html
- **Complete required dialysis training**
  - Learn how to enroll a dialysis facility in NHSN (Steps 1 – 5)
    - Print the NHSN Facility Administrator Enrollment Guide
  - Learn how to do NHSN Set-up for outpatient dialysis
  - Learn what to data to collect and how to data entry

NHSN Enrollment Steps 1 - 5

1. **Agree to Rules of Behavior**
2. **Facility Registration**
3. **Acquire Digital Certificate**
   - Request
   - Install
4. **Access NHSN Enrollment Page**
   - Submit Facility Contact Information
   - Submit Outpatient Dialysis Practices Survey
5. **Print, Sign & Return Consent Form**
   - Upon receipt, NHSN activates facility & sends confirmation email

Reference Materials

- **NHSN Facility Administrator Enrollment Guide**
  - Print this guide for your reference
  - Contains detailed instructions and helpful information
- **Available at http://www.cdc.gov/nhsn/enroll.html**



Enrollment steps

http://www.cdc.gov/nhsn/dialysis/cms-dialysis-enroll-steps.html

5 step process with very easy instructions, including time frames for completing each process

For assistance contact: nhsn@cdc.gov