Welcome to

Tune in to Safe Healthcare: Reducing Infection in the Outpatient Dialysis Facility - Results of the Standardizing Care to Improve Outcomes in Pediatric End Stage Renal Disease (SCOPE) Collaborative

The audio for today’s webinar will be coming through your computer speakers. Please ensure your speakers are turned on with the volume up.

Thank you!
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ACCREDITATION STATEMENTS:

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DISCLOSURE: In compliance with continuing education requirements, all presenters must disclose any financial or other associations with the manufacturers of commercial products, suppliers of commercial services, or commercial supporters as well as any use of unlabeled product(s) or product(s) under investigational use.

CDC, our planners, our presenters, and their spouses/partners wish to disclose they have no financial interests or other relationships with the manufacturers of commercial products, suppliers of commercial services, or commercial supporters with the exception of Dr. Bradley Warady and he wishes to disclose that he is a research sponsor for Baxter Healthcare. Planning committee reviewed content to ensure there is no bias.

Content will not include any discussion of the unlabeled use of a product or a product under investigational use.

CDC did not accept commercial support for this continuing education activity.
PROGRAM DESCRIPTION:

- This presentation will include a discussion of results of the Standardizing Care to Improve Outcomes in Pediatric End stage renal disease (SCOPE) Collaborative, which is a Quality Transformation Network for dialysis centers serving children aiming to:
  - Improve patient outcomes
  - Support collaborating pediatric nephrology centers
  - Enable physicians to meet the American Board of Pediatrics (ABP) Part IV and Maintenance of Certification (MOC) requirements, and
  - Generate new knowledge and evidence-based clinical practices in the pediatric nephrology population.

CEOBJECTIVESFORTHESAHEALTHCAREWEBINAR SERIES:

- Describe infection control techniques that reduce the risk and spread of healthcare-associated infections (HAI).
- Identify unsafe practices that place patients at risk for HAIs.
- Describe best practices for infection control and prevention in daily practice in healthcare settings.
- Apply standards, guidelines, best practices, and established processes related to safe and effective medication use.
Reducing Infection in the Outpatient Dialysis Facility - Results of the Standardizing Care to Improve Outcomes in Pediatric End Stage Renal Disease (SCOPE) Collaborative

January 31, 2017

National Center for Emerging and Zoonotic Infectious Diseases
Division of Healthcare Quality Promotion
The *Making Dialysis Safer for Patients Coalition* is a collaboration of diverse organizations who have joined forces with the common goal of promoting the use of CDC’s core interventions and resources to prevent bloodstream infections in dialysis patients.
Feat ured Speakers

- Bradley A. Warady, M.D., Professor of Pediatrics at the University of Missouri-Kansas City School of Medicine; Director, Division of Nephrology and Director, Dialysis and Transplantation at Children's Mercy Hospital

- Alicia Neu, M.D., Professor of Pediatrics and Division Director for Pediatric Nephrology at the Johns Hopkins University School of Medicine, Director of Pediatric Dialysis and Kidney Transplantation, the Bloomberg Children’s Center at Johns Hopkins Hospital

CDC Disclaimer: The findings and conclusions in this presentation are those of the presenter(s) and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
Before We Get Started…

- **To submit a question:**
  - Use the “Chat” window, located on the lower left-hand side of the webinar screen.
  - Questions will be addressed at the end of the webinar, as time allows.

- **To ask for help:**
  - *Please press the “Raise Hand” button, located on the top left-hand side of the screen.*

- **To hear the audio:**
  - *Please ensure your speakers are turned on with the volume up* — the audio for today’s conference should be coming through your computer speakers.

*The speakers’ slides will be provided to participants in a follow-up email.*
Reducing infection in the outpatient dialysis facility:

Results of the Standardizing Care to Improve Outcomes in Pediatric ESRD (SCOPE) Collaborative
Dialysis Modality by Age

![Bar chart showing the percentage of patients by age and dialysis modality. The chart compares peritoneal dialysis (PD) and hemodialysis (HD). The data is from NAPRTCS, 2011.]
Peritonitis Project: Rationale

- Peritonitis is the leading cause for hospitalization in pediatric PD patients worldwide
- Recurrent peritonitis is a leading cause for PD failure
- Infection is a leading cause of mortality in pediatric PD patients
Peritonitis Variability In US
(Months between Infections)

Each value represents mean peritonitis rate at single pediatric peritoneal dialysis facility between 2003-2008
SCOPE Collaborative Structure

• Children’s Hospital Association Structure & Support
  – Experience facilitating national collaboratives
  – Model includes multi-disciplinary, multi-institutional faculty

• NAPRTCS
  – 25 years of experience with data collection in pediatric CKD/Dialysis/Transplant from over 140 pediatric nephrology centers

• Site Teams
  – Form multi-disciplinary team to test and implement bundles
  – Report process & outcome data monthly
  – Participate in workshops, webinars & listserv
40 SCOPE CENTERS
Quality Transformation Collaborative

- **STANDARDIZE** care
- Audit to ensure **RELIABLE** performance of standardized care
- **TEACH** clinical teams to change their behaviors and *how to engage patients/families to implement best practices*
- **SUPPORT** teams with monthly transparent **DATA** and networking sessions
- Scientifically **ASSESS** impact of effort
Quality Transformation Collaborative

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- Scientifically **ASSESS** impact of effort
Standardizing PD Catheter Care

- PD Catheter Insertion Bundle
- Training Bundle
- Follow Up Care Bundle
PD Catheter Insertion Bundle

• Catheter exit-site orientation in the lateral or downward position
• IV 1st generation cephalosporin x 1 dose prior to incision
• No sutures at exit site
• Post-op
  • Catheter immobilized
  • No dressing changes in 1st 7 days and then only sterile (gown, mask, gloves) dressing changes until exit site healed
  • No catheter use for 14 days
Patient and Care Giver Training Bundle

- Training performed by qualified RN
- Training RN to pt/family ratio 1:1
- Primary provider & alternate for each patient
- Appropriate teaching aids
- Unit training protocols based upon ISPD guidelines
- Specific protocols for aseptic technique, WHO hand hygiene, exit site care
- Post-training concept test & demo test
- Home visit
PD Catheter/Exit Site Follow-Up Care Bundle

- **Monthly visit**
  - Exit-site scored by RN (IPPN scoring)
  - Key aspects of hand hygiene, exit site care and aseptic technique reviewed
- **Every 6 month demo test and concept test**
- **Re-training after peritonitis episode**
- **Prophylactic antibiotics with touch contamination or other break in aseptic technique according to ISPD guidelines**
Quality Transformation Collaborative

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Compliance Data

- EVERY catheter insertion
- EVERY initial training session
- EVERY follow-up visit
Training compliance

Training Overview
- Training performed by RN
- Just pt/caregiver and Trainer (1:1)
- Training comply with ALL checklist items under overview

Sub-components
- Hand Hygiene
  - All steps in hand hygiene protocol reviewed
- Exit Site Care
  - All steps in exit site care protocol reviewed
- Aseptic Technique
  - All steps in aseptic technique protocol reviewed
- Post-Training
  - Training comply with ALL checklist items under post-training protocol
  - At least 1 home visit
Quality Transformation Collaborative

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The Model for Improvement

- Developing a culture of safety
- Using small tests of change
Quality Transformation Collaborative

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PLEASE NOTE: To access the Directory, please type NAPRTCS in the User Name box and WELCOME in the Password box when you are prompted. (The ID and password are case sensitive - all caps)

Welcome to the NAPRTCS Website

NAPRTCS is now known as the North American Pediatric Renal Trials and Collaborative Studies.

At the outset of the study, the operational objective of this group was to obtain the voluntary participation of all renal transplant centers in North America in which multiple (>4) pediatric patients received renal allografts annually. Scientific...
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PD Project  Launched October 2011
Enrollment/Data (October 4, 2016)

• 1210 enrollments, 873 terminations
• 1073 Catheter Insertions
  • 748 New
  • 325 Prevalent
• 1098 Training Sessions
  • 573 Initial
  • 573 Re-training
• 15214 Follow Up Forms
• 833 Infections over 16998.89 catheter-months of follow up
  • 596 Peritonitis episodes
  • 237 Exit site/tunnel infections
Aggregate Monthly Exit Site Infection

Monthly: Interval Between Exit Site Infections

Monthly: Annualized Exit Site Infection Rate
Aggregate Monthly Exit Site Infection
Annualized Exit Site Rate by Month: Pre- thru 57 Months Post

N=22 Centers with Pre/Post Data, Excluding Hospitalizations

Rates – Exit Site
Median Cost: $14,049 per infection episode

ICU stay, septic shock, and fungal peritonitis associated with higher cost of hospitalization
Data Review and Networking Opportunities

- Monthly Webinars
- Twice Yearly Face to Face Learning Sessions
- eGroup/Listserv
- Practice Inventory
- Online sharing of resources
Quality Transformation Collaborative

- **STANDARDIZE** care
- Audit to ensure **RELIABLE** performance of standardized care
- **TEACH** clinical teams to change their behaviors and *how to engage patients/families to implement best practices*
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- Scientifically **ASSESS** impact of effort
Implementation of standardized follow-up care significantly reduces peritonitis in children on chronic peritoneal dialysis

Alicia M. Neu¹, Troy Richardson², John Lawlor², Jayne Stuart², Jason Newland³, Nancy McAfee⁴ and Bradley A. Warady³; and the SCOPE Collaborative Participants⁵

¹Division of Pediatric Nephrology, Johns Hopkins University School of Medicine, Baltimore, Maryland, USA; ²The Children’s Hospital Association, Alexandria, Virginia, USA, and Overland Park, Kansas, USA; ³Divisions of Pediatric Nephrology and Infectious Diseases, Children’s Mercy Hospital, Kansas City, Missouri, USA; and ⁴Seattle Children’s Hospital, Seattle, Washington, USA
Results

Current SCOPE Participants

Participating at Collaborative Launch October 2011

Provided pre-launch patient and infection data

40 Centers

29 Centers

24 Centers

644 enrollments
751 catheter insertions
319 training sessions
7977 follow up forms
Methods

• Monthly Compliance scoring all or none
• Infection rates for each center were calculated as an annualized rate =
  \[ \text{Number of infections during time period} \]
  \[ \text{Peritoneal dialysis patient-years at risk} \]

• Collaborative rates were calculated as the mean of the center rates

Neu AM, et al; Design of the standardizing care to improve outcomes in pediatric end stage renal disease collaborative. Pediatr Nephrol. 2014 Sep;29(9):1477-84
SCOPE Care Bundle Compliance

Monthly Percent Compliance

- PD Cath Insertion Bundle
- Training Bundle
- Followup Bundle
**SCOPE Care Bundle Compliance**

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<td>Follow up</td>
<td>1.10</td>
<td>(1.10,1.11)</td>
<td>&lt;0.001</td>
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<tr>
<td>Follow up (w/ random Hosp Effect)</td>
<td>1.15</td>
<td>(1.11,1.19)</td>
<td>&lt;0.001</td>
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Generalized Linear Mixed Model Techniques
PD Catheter/Exit Site Follow-Up Care Bundle

• Monthly visit
  – Exit-site scored by RN (IPPN scoring)
  – Key aspects of hand hygiene, exit site care and aseptic technique reviewed
• Every 6 month demo test and concept test
• Re-training after peritonitis episode
• Prophylactic antibiotics with touch contamination or other break in aseptic technique according to ISPD guidelines

Monitored at EACH monthly follow up visit for EVERY patient
Barriers to Follow Up Compliance

• Monthly PD visits are multidisciplinary: evaluations by MD, RN, dietician and SW required. Typical length 60-90 minutes.
• CMS requires the following be assessed at every visit:
  • Adequacy of dialysis
  • Anemia
  • Bone and mineral metabolism
  • CV/fluid management
  • Rehab/psychosocial assessment
  • Nutrition
  • Growth and development
  • Transplant status
  • Infection/Dialysis Access
Techniques to increase FU compliance

- Dedicated nurse educator to review topics between visits with other providers
- Use of posters/other visual aids
- Have patient perform ES care in clinic

<table>
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<tr>
<th>ASEPTIC CONNECTION TECHNIQUE</th>
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<tr>
<td>Wash hands with soap and water according to WHO guidelines</td>
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<td>Collect supplies</td>
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<td>Clean work area</td>
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<td>Close windows, turn off fans</td>
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<td>Put on mask</td>
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<td>Perform hand hygiene using WHO handrub procedure (Note: after hand hygiene, hands are <strong>clean</strong> not sterile)</td>
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<td>After handrub, touch only PD supplies and equipment</td>
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<tr>
<td>Perform hand hygiene using WHO handrub procedure, if anything other than PD supplies and equipment is touched</td>
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<td><em>REMEMBER WHICH PARTS OF SUPPLIES ARE STERILE</em></td>
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<td>Perform the connection procedure, according to procedure</td>
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Examples of techniques to increase FU compliance/reduce “review” fatigue

- Have patient monitor provider hand washing
- Glo Germ™ to assess patient/caregiver hand hygiene technique
- Patient video audits
- Video games
Peritonitis Rates

• Pre-launch (13 mo)
  – 206 peritonitis episodes/3778 pt months

• Post-launch (36 mo)
  – 320 peritonitis episodes/8853 pt months
# Mean Monthly Peritonitis Rates

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Generalized Linear Mixed Model assuming a negative binomial distribution with a natural log link function. A random center effect was included to account for center specific variability in peritonitis rates.
Mean Monthly Peritonitis Rates

Collaborative Launch
Mean Monthly Peritonitis Rates
## Sensitivity Analysis

<table>
<thead>
<tr>
<th>Follow Up Compliance %</th>
<th>Month/Year Mean Compliance Achieved</th>
<th># Months to Mean Collaborative Compliance</th>
<th>Ratio of Peritonitis Rates (95% CI)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>65%</td>
<td>November 2012</td>
<td>13</td>
<td>1.23 (0.86, 1.77)</td>
<td>0.311</td>
</tr>
<tr>
<td>70%</td>
<td>March 2013</td>
<td>17</td>
<td>1.27 (0.89, 1.78)</td>
<td>0.168</td>
</tr>
<tr>
<td>75%</td>
<td>July 2013</td>
<td>21</td>
<td>1.37 (0.95, 1.96)</td>
<td>0.086</td>
</tr>
<tr>
<td>80%</td>
<td>November 2013</td>
<td>25</td>
<td>1.42 (1.01, 1.99)</td>
<td>0.045</td>
</tr>
<tr>
<td>85%</td>
<td>March 2014</td>
<td>29</td>
<td>1.65 (1.17, 2.34)</td>
<td>0.007</td>
</tr>
</tbody>
</table>
PD Project: Moving Forward

Ongoing efforts to maintain high level compliance with follow up bundle and improve compliance with insertion and training

- SCOPE Research Groups
  - Infant
  - Fungal peritonitis
  - ES Care
  - Catheter Insertion Training

- PD Innovation Groups
  - Touch contamination
  - Ideal Home Visit

- PD & HD Innovation Groups
  - Health Literacy
  - Patient & Family Engagement

- Cost of peritonitis
  - Link data from SCOPE and PHIS
Hemodialysis Access-Related Infection Prevention Project

• Launched in late 2013 (rolling)
• Combined the success of the PD project with CHA’s other quality transformation projects which successfully reduced access-related blood stream infections in hospitalized children
• Care bundles derived largely from CDC recommendations
Distribution of vascular access type in prevalent pediatric hemodialysis patients (aged 0-21 years* as of December 31, 2015), 2015

Data Source: Special analyses, USRDS ESRD Database. Hemodialysis patients initiating treatment for ESRD at least 90 days prior to December 1, 2015, *who were <22 years old as December 1, 2015, and who were alive through December 31, 2015; Catheter = any catheter use; fistula and graft use shown are without the use of a catheter. Abbreviations: AV, arteriovenous; ESRD, end-stage renal disease.
Hemodialysis Access Care and Maintenance Practices

Standardized Practices for Accessing:

- Tunneled Hemodialysis catheter
- AV Graft
- A/V Fistula
Hemodialysis Catheter Connection/Entry Procedure

– Proper hand hygiene per WHO guidelines
– Use Personal Protective Equipment (PPE) including new, clean exam gloves and proper face protection
– Mask for patient’s face or trach
– Hub/cap is prepped/scrubbed
  - Alcohol (15 second scrub, 15 second dry); CHG (30 second scrub, 30-60 second dry); Povidone-iodine (apply according to manufacturer’s recommendations and let dry); Sodium hypochlorite (60 second scrub, 60 second soak); FDA Approved disinfection device
– Connect catheter to blood lines using aseptic technique
– Remove gloves and perform hand hygiene per WHO guidelines
Hemodialysis Catheter
Disconnection/Cap Change Procedure

- Proper hand hygiene per WHO guidelines
- Use Personal Protective Equipment (PPE) including new, clean exam gloves and proper face protection
- Mask for patient’s face or trach
- Disconnect using aseptic technique
- Cap changed on a schedule specified by manufacturer (every treatment for standard caps, every 7 days for closed connector luer access cap)
- Hub scrubbed
  - Alcohol (15 second scrub, 15 second dry); CHG (30 second scrub, 30-60 second dry); Povidone-iodine (apply according to manufacturer’s recommendations and let dry); Sodium hypochlorite (60 second scrub, 60 second soak)
- Remove gloves and perform hand hygiene per WHO guidelines
Hemodialysis Catheter Exit Site Care and Dressing Change Procedure

- Proper hand hygiene per WHO guidelines
- Use Personal Protective Equipment (PPE) including new, clean exam gloves and proper face protection
- Mask for patient’s face or trach
- Site is prepped
  - CHG (30 second scrub, 30-60 second dry); or 70% Alcohol (15 second scrub, 15 second dry); Povidone-iodine (apply and let dry for 2-3 minutes when used on skin); Sodium hypochlorite (apply and let dry for 2 minutes)
- Appropriate antibiotic ointment/cream at insertion site
  - mupirocin, bacitracin/polymixin, gentamicin, povidone-iodine OR use chlorhexidine-impregnated sponge dressing
- Appropriate dressing change
  - Sterile transparent, semi-permeable dressing: change every 7 days and PRN if soiled, damp or loose
  - Gauze dressing change every 2 days PRN if soiled, saturated or loose
  - Documentation of date of dressing change
- Remove gloves and perform hand hygiene per WHO guidelines
Fistula /Graft Cannulation Procedure

- Patient site washed with soap and water
- Proper hand hygiene per WHO guidelines
- Use Personal Protective Equipment (PPE) including new, clean exam gloves and proper face protection (not applicable for self-cannulation)
- Site is prepped
  - Alcohol (1 minute rubbing motion); CHG (30 second scrub, 30-60 second dry); Povidone-iodine (apply and let dry for 2-3 minutes when used on skin); Sodium hypochlorite solution (apply and let dry for 2 minutes)
- Needles inserted using aseptic technique
- Remove gloves and perform hand hygiene per WHO guidelines
VI. Fistula/Graft
Decanulation Procedure

- Proper hand hygiene per WHO guidelines
- New, clean exam gloves
- Proper face protection
- Remove needles using aseptic technique
- Apply clean gauze/bandage to site
- Compress the site with clean gloves
- Remove gloves and perform hand hygiene per WHO guidelines
HD Data Collection Process Flow: For Each Event

1. **Patient at your center begins receiving outpatient HD**
   - Complete Enrollment form (online at EMMES)

2. **Patient's primary dialysis access changes (catheter is placed, AV fistula or graft is used for first time)**
   - Complete Primary Access/Revision form

3. **HD patient has an infection**
   - Complete HD Event form

4. **If HD patient transfers to a different unit, dies, is lost to follow-up, discontinues HD or is otherwise no longer under your care**
   - Complete HD Termination form
HD Data Collection Process Flow:

**Monthly**
For each HD patient cared for in your center

Complete HD Maintenance Observation Form
Strive to collect 2 times the number of HD patients cared for by your center each month with a maximum of 30 forms/month

**Annually**
For each active HD patient

Complete HD Follow-up Form
HD Project Launched June 2013
Enrollment/Data (October 4, 2016)
• 25 Sites Entering Data
• 498 enrollments
• 4956 Total Observations
• 753 Follow up forms
• Through 8/30/2016:
  • 3174 Catheter observations
    • 2292 Dressing/exit site assessments
    • 2432 Connection/entry observations
    • 2223 Disconnection observations
    • 2371 Cap care observations
    • 1809 Dressing change/exit site care observations
  • 1313 AV fistula/graft observations
    • 1068 Graft Care and Cannulation observations
    • 994 Decannulation observations
• 77 infections over 4300.17 catheter months of follow up
• 2 infections over 1797.57 AV fistula/graft months of follow up
Aggregate Monthly Compliance

04OCT2016

Monthly Compliance Rates

Percent

Catheter Access Compliance

AV Fistula/Graft Access Compliance

0 1 1 0 2 13 6 10 6 15 6 5 5 1 7 0 6 6 7 2 7 8 8 2 8 7 8 5 1 0 5 9 8 1 2 4 1 5 1 0 3 3 2 8 3 8 5 4 5 3 5 3 4 4 7 6 1 6 4 8 6 6 5 3 4 5 5 4 3 8 1 7 7 0 0

0 0 0 0 0 7 1 4 4 7 2 4 3 0 3 3 2 6 3 3 3 5 3 3 3 2 3 8 3 2 4 0 5 4 4 1 4 1 4 9 5 7 5 8 6 5 7 2 6 4 6 4 5 3 6 4 6 2 6 5 5 3 5 9 5 2 5 1 5 2 2 4 0
Rates – Access Related BSI

Access Related BSI Rate by Month: Pre- thru 37 Months Post

N=15 Centers with Pre/Post Data

32.5% decrease in infection rate from 4.0 BSI per 100 patient-months to 2.7 BSI per 100 patient-months.
Thanks to the SCOPE team members and especially to all of our patients and their families
Questions?

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Question and Answer Session & the Coalition

- Please submit your questions via the chat window, located on the lower left-hand side of the webinar screen.
- For more information on the Making Dialysis Safer for Patients Coalition, visit: https://www.cdc.gov/dialysis/coalition/
- Or send an email to DialysisCoalition@cdc.gov

#DialysisPatientsFirst
Before We End Today’s Webinar…

- **Continuing Education**
  - Detailed instructions for taking the post-test and evaluation will appear on your screen as soon as today’s webinar concludes.
  - [www.cdc.gov/tceonline](http://www.cdc.gov/tceonline); Access Code: **WC0131**
  - If you exit out of the webinar prior to taking the post-test and evaluation, you can access the continuing education information in an email that will be sent to you following today’s webinar.

**THANK YOU**