To accomplish these goals this project has engaged the resources of:

- CHA, in assistance in developing and running a quality transformation collaborative
- The American Board of Pediatrics, to certify that the project meets MOC requirements
- EMMES/NAPRTCS to provide a pre-established collaborative network of Pediatric Nephrology Centers currently engaged in data collection and dissemination for the purpose of quality assurance

PDI Initiative Change Package/Bundle

The collaborative improvement effort will have three areas of emphasis for peritoneal dialysis catheter care and maintenance. These areas of focus further codify and define best care approaches which may lead to infection rate reduction.

BUNDLE #1:Peritoneal Dialysis Catheter Insertion Bundle:

1. Standardize CPD catheter exit-site orientation to the lateral or downward position
2. Standardize use of a single dose of a first generation cephalosporin at the time of CPD catheter placement
3. Standardize post-operative exit-site care to include standard duration without dressing change, use of sterile dressing changes until exit-site is healed, and immobilization of the CPD catheter during healing phase

BUNDLE #2: Peritoneal Dialysis Training Bundle

1. Standardize Registered Nurse as training personnel
2. Standardize trainer to trainee (or family) ratio to 1:1
3. Standardize that at least one primary provider and alternate provider receive training for each patient
4. Standardize use of teaching aides such as photographs, mannequin or apron during training.
5. Standardize use of a pediatric-specific training manual.
6. Standardize inclusion of key aspects of training in the areas of hand washing, exit-site care and aseptic technique.
7. Standardize that post-training concept and demonstration tests be administered at the completion of training and one month following completion of training
8. Standardize that a home visit be performed during the training period

BUNDLE #3: Peritoneal Dialysis Catheter/Exit Site Follow up Care Bundle

1. Standardize inclusion of objective score of exit-site, evaluation for immobilization of catheter and review of key aspects of training in monthly follow-up evaluation
2. Standardize that post-training concept and demonstration test be administered every 6 months
3. Standardize that re-training be performed after a peritonitis episode
4. Standardize use of prophylactic antibiotics after touch contamination or other break in aseptic technique according to the ISPD guidelines

PDI Initiative Core measures:

Patient Outcome Measures

- Exit-site infection rates defined as:
  - Number of infections for a time period, divided by dialysis-years time at risk and expressed as episodes per year (e.g. 0.43 episodes per year)

- Months of peritoneal dialysis at risk, divided by number of episodes, and expressed as interval between episodes, as defined by the ISPD guidelines (e.g. 1 episode every 28.1 patient months)
- For the purposes of the project, an exit site infection will be defined as treatment for exit site infection. As per the ISPD guidelines, The diagnosis of a catheter exit-site infection should be made in the presence of a purulent discharge from the sinus tract, or marked pericatheter swelling, redness, and/or tenderness, with or without a pathogenic organism cultured from the exit site. Infectious symptoms should be rated according to an objective scoring system (see table below) and an infection should be assumed with a cumulative exit-site score of 4 or greater.

Exit-Site Scoring System

	0 Points	1 Point	2 Points
Swelling	No	Exit only (<0.5 cm)	Including part of or entire tunnel
Crust	No	<0.5 cm	>0.5 cm
Redness	No	<0.5 cm	>0.5 cm
Pain on pressure	No	Slight	Severe
Secretion	No	Serous	Purulent

[a] Infection should be assumed with a cumulative exit-site score of 4 or greater.

- Peritonitis rates defined as:
  - Number of infections for a time period, divided by dialysis-years time at risk and expressed as episodes per year
  - Months of peritoneal dialysis at risk, divided by number of episodes, and expressed as interval between episodes, as defined by the ISPD guidelines
  - For the purposes of the project, a peritonitis episode will be defined as treatment for peritonitis. As per the ISPD guidelines, an empiric diagnosis of peritonitis should be made if the peritoneal effluent is cloudy, the effluent white blood cell (WBC) count is greater than 100/mm3, and at least 50% of the WBCs are polymorphonuclear leukocytes.
  - Relapsing peritonitis, defined as a recurrence of peritonitis with the same organism as in the immediately preceding episode, according to antibiotic susceptibilities, or a second culture negative infection within 4 weeks of completion of antibiotic treatment will be tracked, not be counted as a new infection.
- Median infection rates for the program will be determined by calculating the infection rate for each patient, and then obtaining the median of these rates

Process Measures

- Percent of patients for which all required catheter insertion, training and maintenance bundle components were implemented across dialysis unit
- Percent compliance with each bundle component in the dialysis unit
- Safety culture score at beginning of collaborative and annually thereafter

Additional Measures: Clinical and Demographic Data

For risk stratification exploration, the following additional variables will be captured for all patients experiencing an exit-site infection or peritonitis episode: Also capture data (with exceptions noted below) on all patients at time of catheter placement.

- Age
- Cause of ESRD
- Date of dialysis initiation
- History of previous kidney transplant
- Presence of gastrostomy tube/button
- Presence of urinary stoma (continent or incontinent)
- History of touch contamination, catheter leak or other break in aseptic technique within one week of infection (only after infection)
- Characteristics of peritoneal dialysis catheter (Exit site orientation (up/down/lateral), tunnel configuration (swan neck, straight, single cuff, dual cuff)
- Type of adapter (titanium/other)
- History of screening for and/or treatment of S. aureus carriage in patient and/or caregiver
- Identity of provider performing dialysis at time of infection and whether that provider received training (only after infection)
- Type of immobilization device used
- For exit site infection: Exit site score at time of infection/Culture obtained (Y/N), if yes, organism recovered (Y/N) if yes, specify. (only after infection)
- For peritonitis: Culture results (include negative)/ Was this episode a relapse (ie same organism within 4 weeks?/ Outcome of episode (resolution/removal of catheter/reduction in membrane function) (only after infection)

Participants

All hospital Pediatric Nephrology teams who perform chronic peritoneal dialysis are invited to participate in this project. Participants will include clinicians specializing in Pediatric Nephrology and quality improvement, and infection control professionals from across the country. Teams of all sizes are encouraged to participate. Institutional membership in CHA is not required.

Clinicians who participate will:

- Receive the most current pediatric recommendations for the management of exit site infections and peritonitis in children (pediatric specific vs. extrapolated from adult data)
- Receive materials for use in clinical practice
- Learn early the results of collaborative studies and quality improvement projects
- Establish and implement best practices
- Contribute to the advancement of science and clinical practice
- Learn improvement science methods that can be applied to other topics
- Become a member of an esteemed collaborative
- Satisfy a requirement for Part IV maintenance of certification by the American Board of Pediatrics

The project requires Pediatric Nephrology clinical leadership and principal investigator roles that will gain experience in PDI reduction and elimination; a passion for achieving results; the ability to communicate with and engage physicians across the country; and the willingness to be visible and/or vocal at project related workshops and meetings. The Planning Committee was crucial in the development of the proposal and charter and includes key leaders in moving this national collaborative forward.

Planning Committee

- Mike Aldridge, MSN, RN, CCRN
- Paul Kurtin, MD
- Nancy McAfee, MSN, RN, CCN
- Marlene Miller, MD, MSc
- Alicia M Neu, MD
- Bradley A Warady, MD

SCOPE Faculty

SCOPE is now led by a national faculty including clinical leaders, infectious disease specialists, and quality improvement experts.

- Brandy Begin, RN
- Chris Day, MD
- Jennifer Ehrlich, RN
- Alicia M Neu MD
- Bradley A Warady MD

Expectations and Boundaries

For the length of time of this project, the PDI Clinical Faculty Steering committee and CHA will:

1. Provide an opportunity to participate in a collaborative that we believe can substantially reduce exit site infection and peritonitis rates in your patients
2. Provide evidence-based information on PDI
3. Teach participating centers how to apply a care model for reducing PDI
4. Teach the Model for Improvement
5. Offer coaching to Pediatric Nephrology teams on implementing and evaluating changes
6. Coordinate communication activities to keep participants connected to the steering committee and to colleagues during the improvement collaborative
7. Develop a framework for testing changes in care delivery
8. Provide tools, forms, and other aids to help with implementation of key areas of care for reducing PDI
9. Commit to writing multiple peer-review manuscripts with rigorous data analysis on collaborative efforts.

Participating organizations and teams are expected to:

1. Commit a senior leader – this may be the same person as the physician champion – to support and promote the team working on the collaborative improvement project
2. Send one (required) or two(recommended) team members who have the authority to drive change, including the physician champion and, ideally, a nurse and/or infection control professional, to two 2-day learning workshops per year (travel costs to be covered by participating hospital)
3. Provide resources and support to the hospital's team (includes attending workshops, devoting time to data entry, testing and implementing changes, and promoting active senior leadership)

4. Collect and submit data every month to the collaborative database
5. Provide staff to accommodate the approximately 40 hours of data collection required per month
6. Implement the standardized database collection tool to track patients and their care and submit monthly data
7. Commit to be transparent with all data to all other teams within the collaborative group
8. Work to involve all hospital staff as appropriate with the aim of helping the multidisciplinary clinical team become competent in safety and quality improvement
9. Perform pre-work activities to prepare for workshops
10. Connect project goals to the broader patient safety work in the hospital
11. Participate in collaborative group webinars and conference calls and a collaborative discussion listserv to share with and learn from others
12. Make well-defined measurements at least monthly, plot them over time for the duration of the collaborative improvement project and share them with the other teams in the collaborative
13. Maintain responsibility for IRB requirements for a quality improvement project (with option to publish aggregate data)

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