

Using CQI Techniques for Managing Infections in PD Patients

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"PD should be offered to most patients as a valuable alternative to hemodialysis and transplantation and not as a last resort."

Progress has been made in the prevention and treatment of the infectious complications of peritoneal dialysis (PD). Among the technological advances responsible for much of this are improved connectology, better systems for continuous ambulatory PD (CAPD), and automated PD (APD) that require fewer connections, the increased utilization of therapeutic modalities using flush-before-fill fluid flow patterns, and more effective diagnosis and treatment of infection.

Despite better infection control with PD during the last decade, however, the complications that occur often threaten both patient and program success. To counter this, PD programs can take continuous quality improvement (CQI) steps to train and follow patients on this modality. This approach focuses on *preventing* complications rather than simply treating them.

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CQI Steps

The CQI process begins when a training program is developed or revised. Instead of just quickly training the patient to do the procedures of PD, the teaching content for patients and the CQI process are developed to focus on the factors or root causes of potential reasons for modality failure.

The process continues with the initial patient selection. Prospective patients are interviewed and assessed not only for the ability and willingness to perform the procedures correctly, but also for the risk factors for developing complications, i.e., peritonitis, inadequate treatment, and catheter complications. The staff should use cause and effect diagrams, often called fishbones, to guide their questioning (Figure 1). Each fishbone displays root causes or reasons for significant complications as well as risk factors. If the patient is accepted into the program, teaching and treatment plans are modified to focus on prevention or minimization of the risk factor(s). For example, a new patient who has rheumatoid arthritis and is on chronic immunosuppression is accepted for training in PD. Immunosuppression is identified as a risk factor for development of peritonitis and a CQI Action Plan is devised to prevent the development of this complication.

TABLE 1 CHARACTERISTICS OF A SUCCESSFUL PD PROGRAM

- Careful patient selection
- Well developed training program for patients and nurses
- Application of a CQI program
- Knowledge and enthusiasm of the renal team
- Staff dedicated to PD
- PD nurse on call for telephone consultation with patients
- Protocols and algorithms for:
 - Therapy selection
 - Treatment of complications
- Use of strict guidelines for initiation and delivery of therapy
- Strict adherence with monthly visits for clinical monitoring
- Regular monitoring of delivered therapy

Issues in Peritoneal Dialysis

FIG. 1 A FISHBONE DIAGRAM FOR TRACKING THE CAUSE OF PERITONITIS

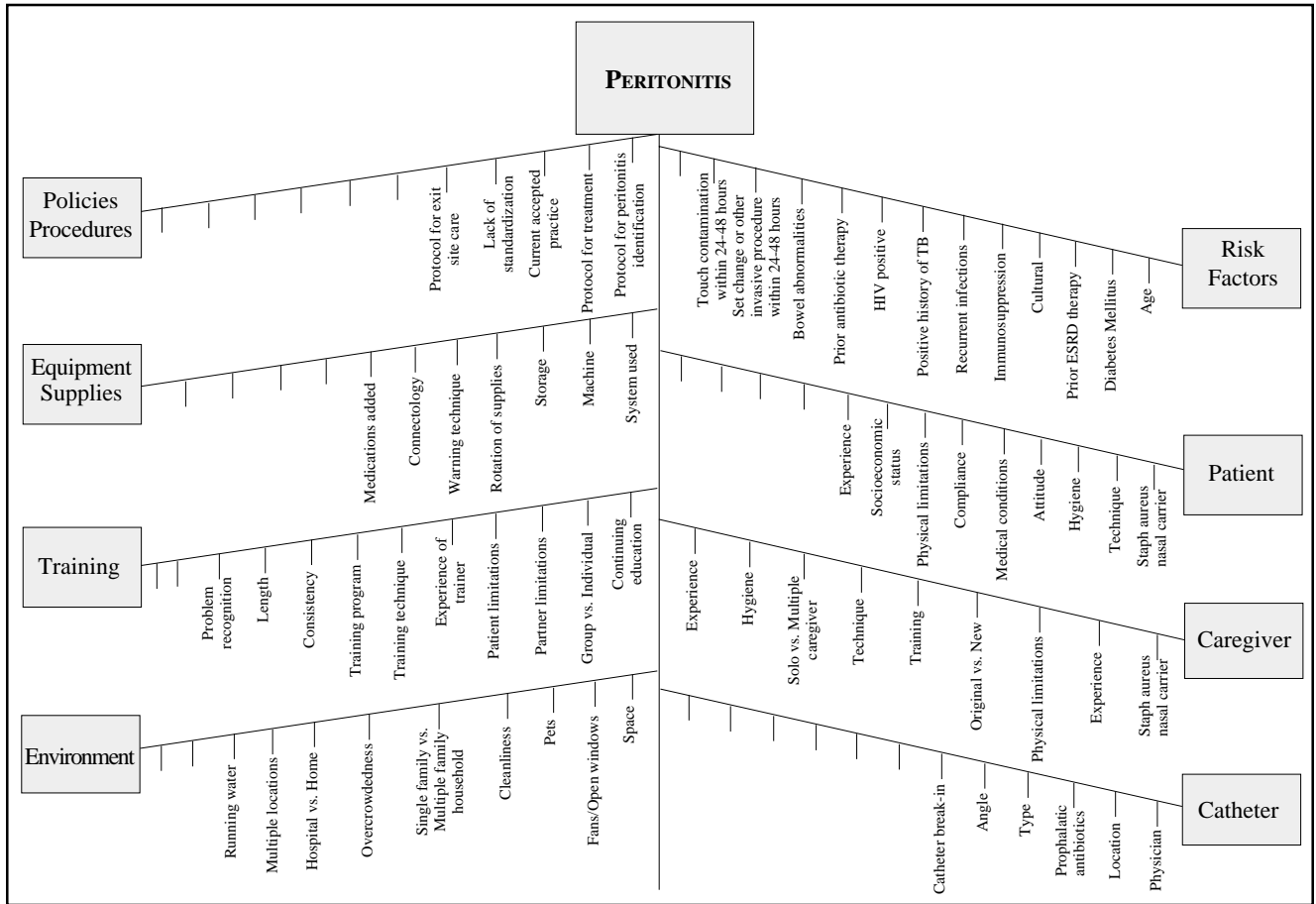


FIGURE 2 CONTINUOUS QUALITY IMPROVEMENT ACTION PLAN

Problem Statement: Episodes of peritonitis (E.O.P) exceed standards
Root Causes: System used: patient related factors (hygiene, handwashing)
Data Required: Organisms, Systems, Patient-related Factors, Techniques
Solution to Implement: Teaching and Review, System Change, Evaluation

Needed Resources
 Training Tools, New Systems, National Standards for Treatment of Peritonitis

Action Plan (steps)	Responsible Team Member	Start Date	Estimated Completion	Checkpoint Dates	Date Completed	Comments (status, outcomes, disposition)
Review patient technique	Nurse 1	1/5/95	1/30/95	1/12	1/30/95	Four patients evaluated required review or retraining.
Retrain techniques	Nurse 1	1/5/95	1/30/95	1/12 1/19 1/26	1/30/95	All 4 patients demonstrated acceptable practice after retraining session.
Change systems	Nurse 2	1/12/95	2/10/95	1/28/95	2/10/95	2 patients required changes; 2 degrees to conventional system, >1 of peritonitis.
Review and compare current treatment plans to national standards	MD 1	1/5/95	1/12/95	N/A	1/12/95	Plans varied from national standards in several areas; protocols revised to reflect changes.

When complications occur, CQI offers a consistent and structured process to 1) identify the cause of the complication, 2) develop a plan to correct or minimize the problem, and 3) prevent the problem (if possible) in the future. Cause and effect diagrams are used to systematically review potential factors or root causes of the complication so all factors are considered. Data collection tools such as computer reports, checklists, interviews, etc. guide the review or investigative process. Once the cause has been identified, a patient specific action plan can be developed to correct the current problem, but equally important, prevent it in the future. Figure 2 provides an example of an action plan for a patient whose rate of peritonitis exceeded the clinic's standards.

Patient Specific Quality Improvement (QI)

Activities

Patient specific QI activities are important, but overall program trending of QI activities are critical if the PD program is to succeed long-term. Taking the example of peritonitis detailed in the action plan, a proactive PD quality improvement team will assess the trend in the rate of complications on a monthly basis, looking for statistically significant occurrences as well as recurring root causes. Trend charts such as the one shown in Figure 3 are helpful in visualizing peritonitis rates. In this particular example, the rate of peritonitis is graphically summarized for seven quarters for Facility X and for all the facilities in the state. The data for the state include the mean incidence of peritonitis and the standard deviation (SD) range. It is apparent that the trend for both facility and state is favorable with a diminishing rate of peritonitis in time. However, despite the definite improvement in peritonitis rates at Facility X, the incidence remains markedly worse than the state as a whole. When trends are identified, review of individual patient data collection tools for the particular complication will reveal root cause trends.

In our experience, the most significant characteristics of successful programs are summarized in Table 1. Inadequate patient selection should be singled out as a very important, but frequently neglected cause of high complication rates and poor patient and technique survival. A program may enjoy

FIGURE 3 PERITONITIS INCIDENCE TREND CHART

most of the positive attributes listed in the table, but may reserve PD for "patients unable to do hemodialysis." In view of all the recent advances in hemodialysis (controlled ultrafiltration, ultrapure water, bicarbonate solutions, biocompatible membranes, etc.), it is likely that patients unable to hemodialyze would be extremely fragile, often malnourished and plagued with many co-morbid conditions. PD should be offered to most patients as a valuable alternative to hemodialysis and transplantation and not as a last resort. CQI can identify patterns and trends of patient selection and help focus on appropriate practices associated with best outcomes.

In summary, CQI can help clinicians meet the challenges facing PD programs' long-term patient and program success. It helps the programs achieve their mission to provide safe and effective long-term therapy in the home using a proactive approach. Its focus is on those features associated with a successful program, identifying risk factors and root causes of complications and modifying training and procedures to correct and prevent the problems. CQI provides the structure and process for such an approach to care. **NN&I**