

Evaluation of Educational Interventions for Catheter Exit Site Management in Chronic Hemodialysis Patients at Saint Paul's Hospital (ACCESS)

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Background

- Catheter-related bacteremia (CRB) is the most common and serious complication of hemodialysis (HD) patients who use catheters for vascular access.
- An exit site infection (ESI) may lead to CRB.
- Providence Health Care's (PHC) Renal, Pharmacy and Microbiology departments collaborated to provide a series of educational interventions to HD staff to enhance their ability to accurately and promptly recognize and treat an ESI.
- The educational interventions included:
 - ESI screening tool to objectively and systematically assess exit site at each HD run
 - Proper exit site swabbing techniques
 - Proper interpretation of exit site swab culture results

Methods

- Retrospective study of HD patients at Saint Paul's Hospital
- Study period:
 - 12 months pre-interventions (Jan 1, 2010 - Dec 31, 2010)
 - 1 month educational intervention (Jan 1, 2011 - Jan 31, 2011)
 - 12 months post-interventions (Feb 1, 2011 - Jan 31, 2012)

Primary Objectives

- To compare pre- and post-educational interventions:
 - incidence of clinically diagnosed ESI (defined as an antibiotic course ≥ 10 days)
 - use of topical and systemic antibiotics
 - specimen quality as defined by Microbiology department

Secondary Objectives

- To compare pre- and post-educational interventions:
 - incidence of presumed CRB
 - number of hospitalizations related to CRB
 - number of catheter replacements related to CRB

Patient Characteristics	Pre n = 99	Post n = 102
Age (years, mean \pm SD)	64.8 \pm 14.2	64.9 \pm 16.6
Male (%)	57.6	63.6
Dialysis vintage (days, mean \pm SD)	482.5 \pm 472.1	584.9 \pm 564.9
Catheter vintage prior to enrollment (days, mean \pm SD)	124.2 \pm 275.1	123.7 \pm 265.1
Femoral Catheter (%)	3.1	3.7

Table 1: Baseline Patient Characteristics

Results

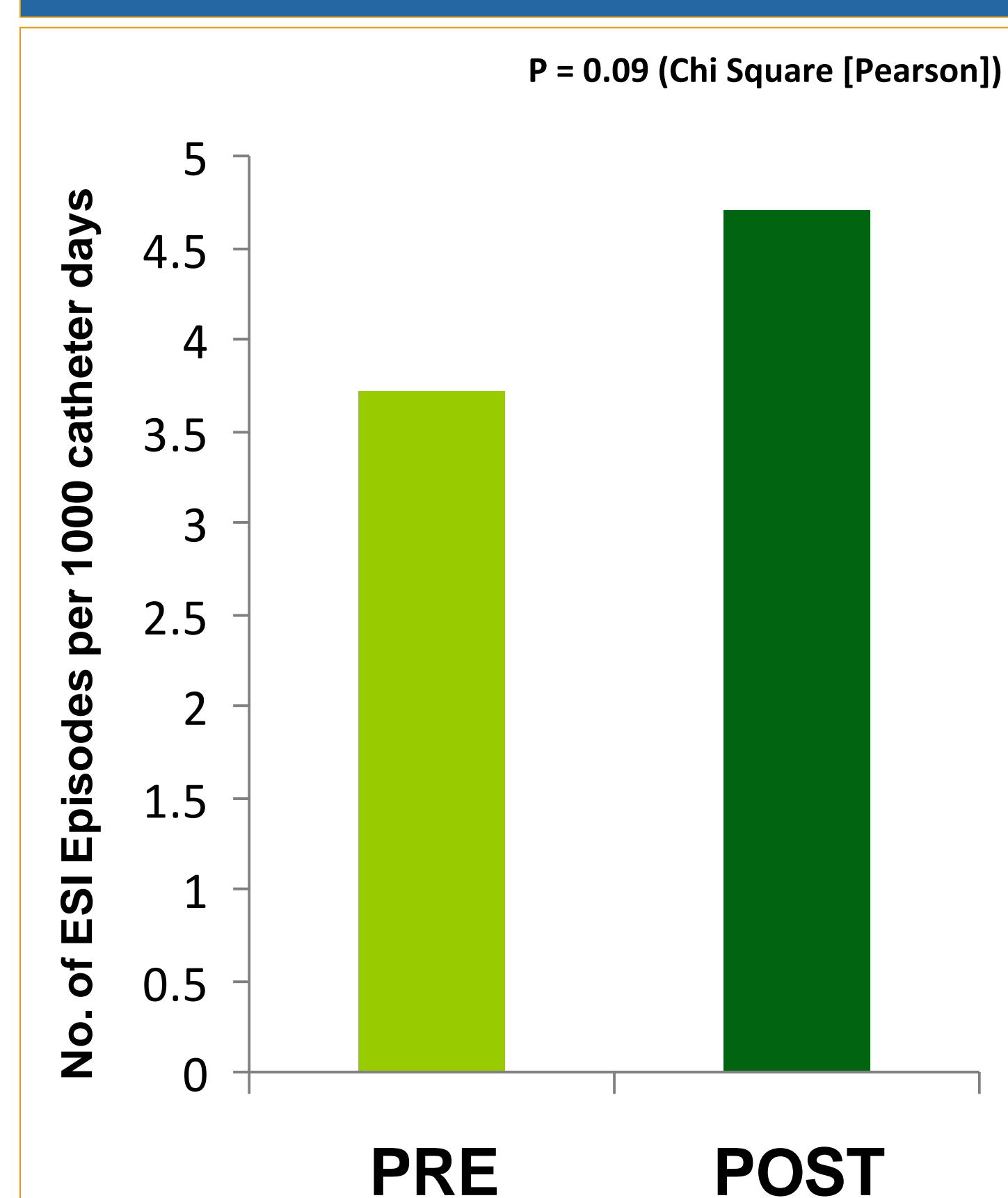


Figure 2: Incidence of Clinically Diagnosed ESI

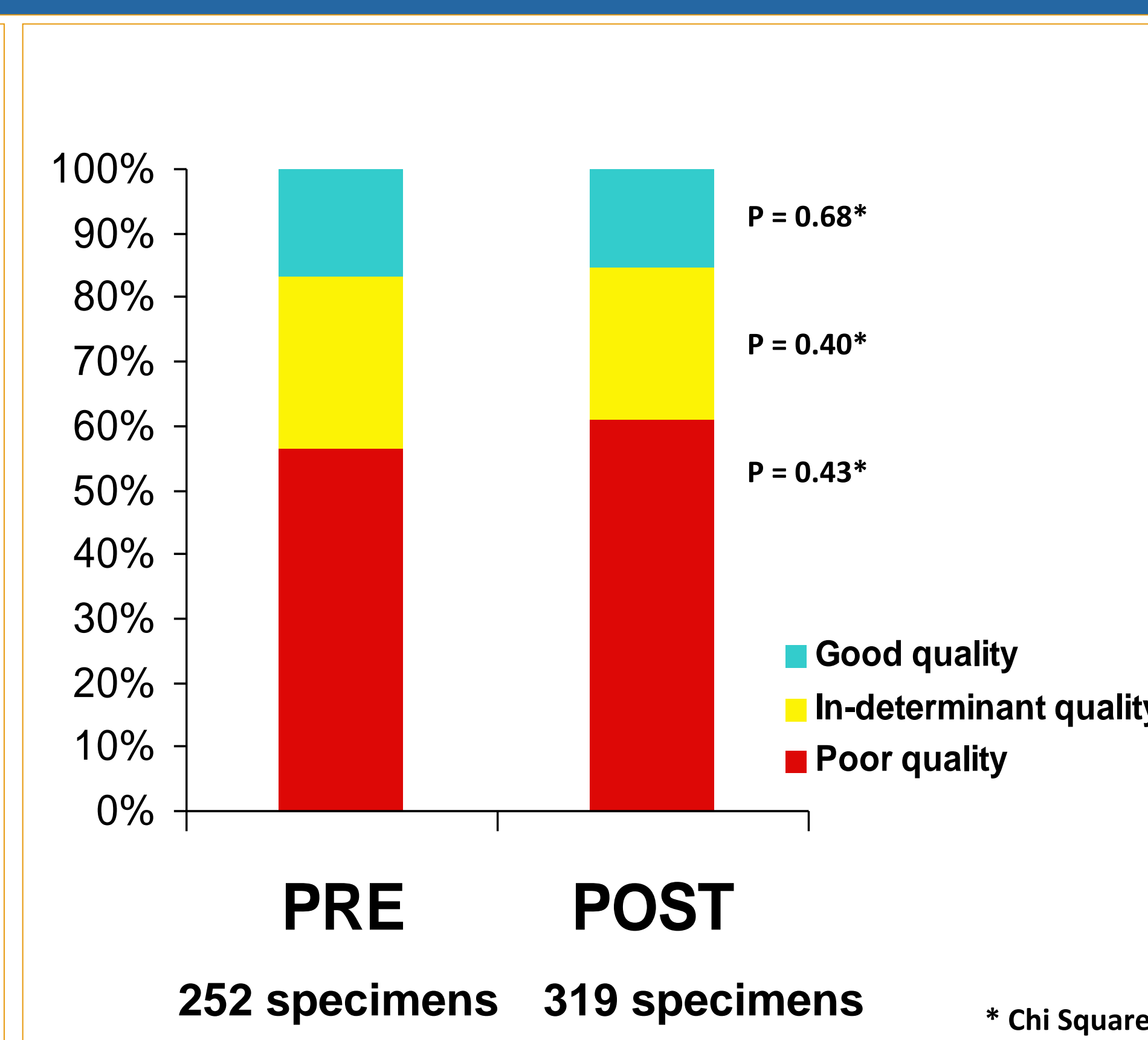


Figure 3: Specimen Quality

Results

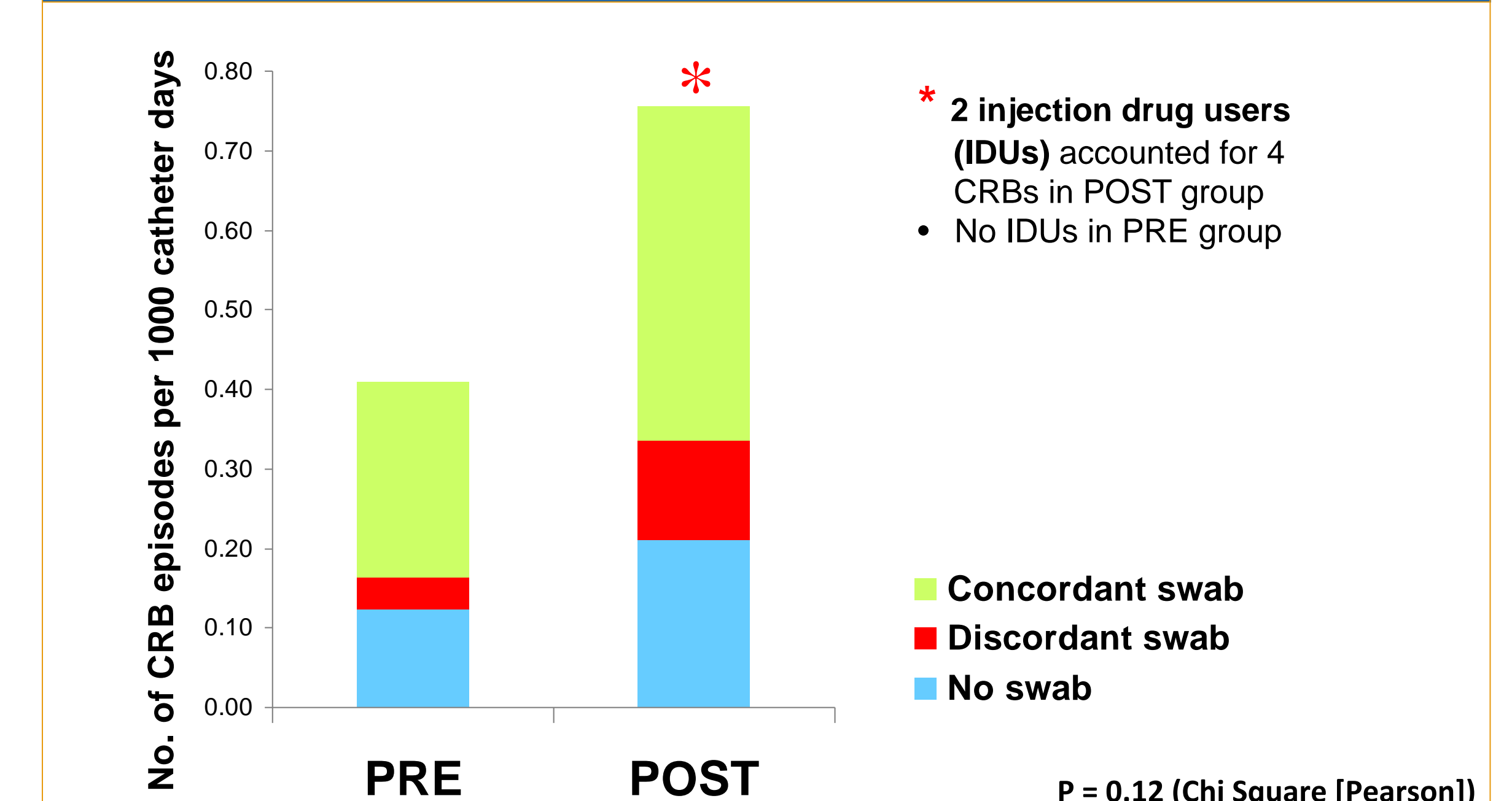


Figure 5: Incidence of Presumed CRB

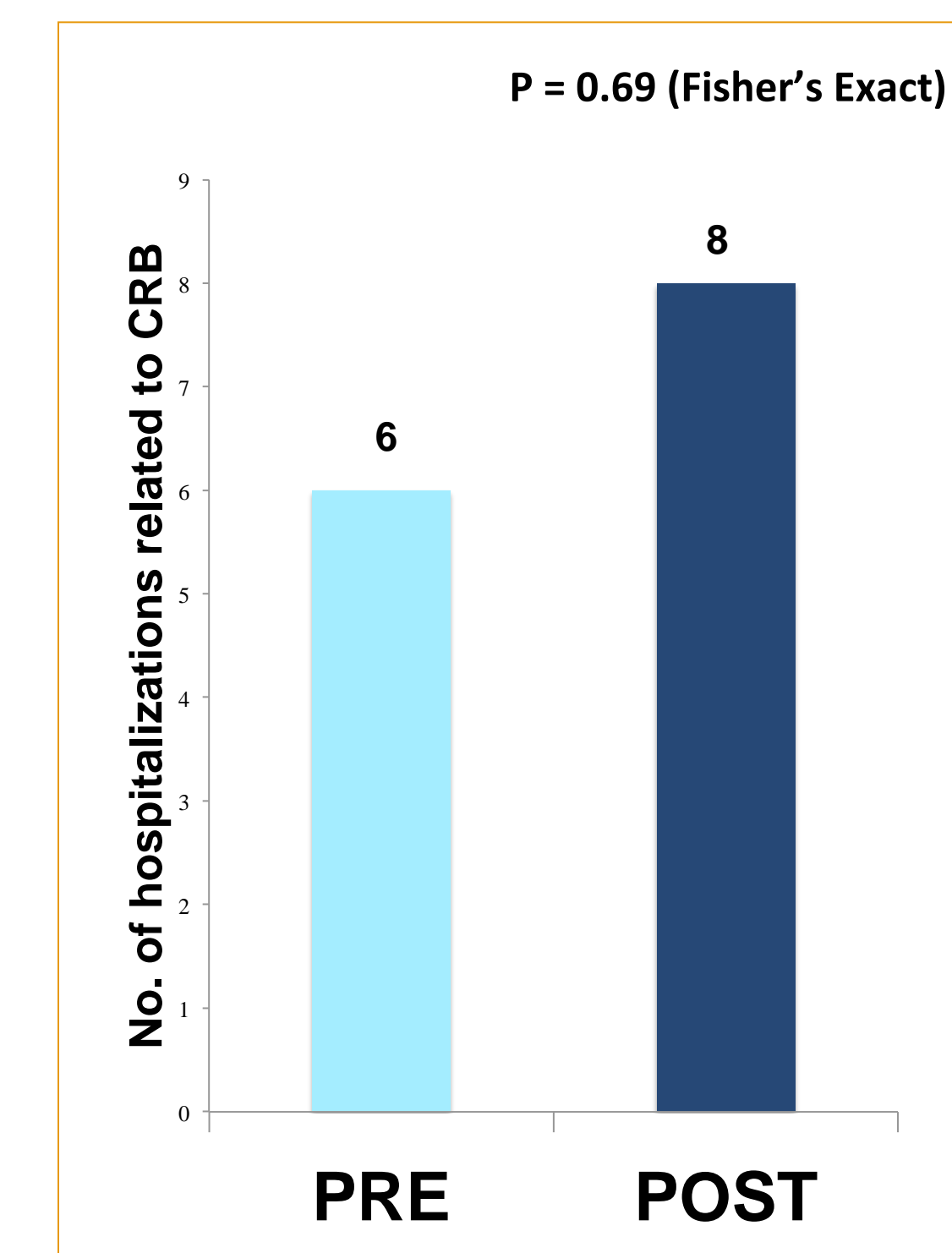


Figure 6: Hospitalizations Related to CRB

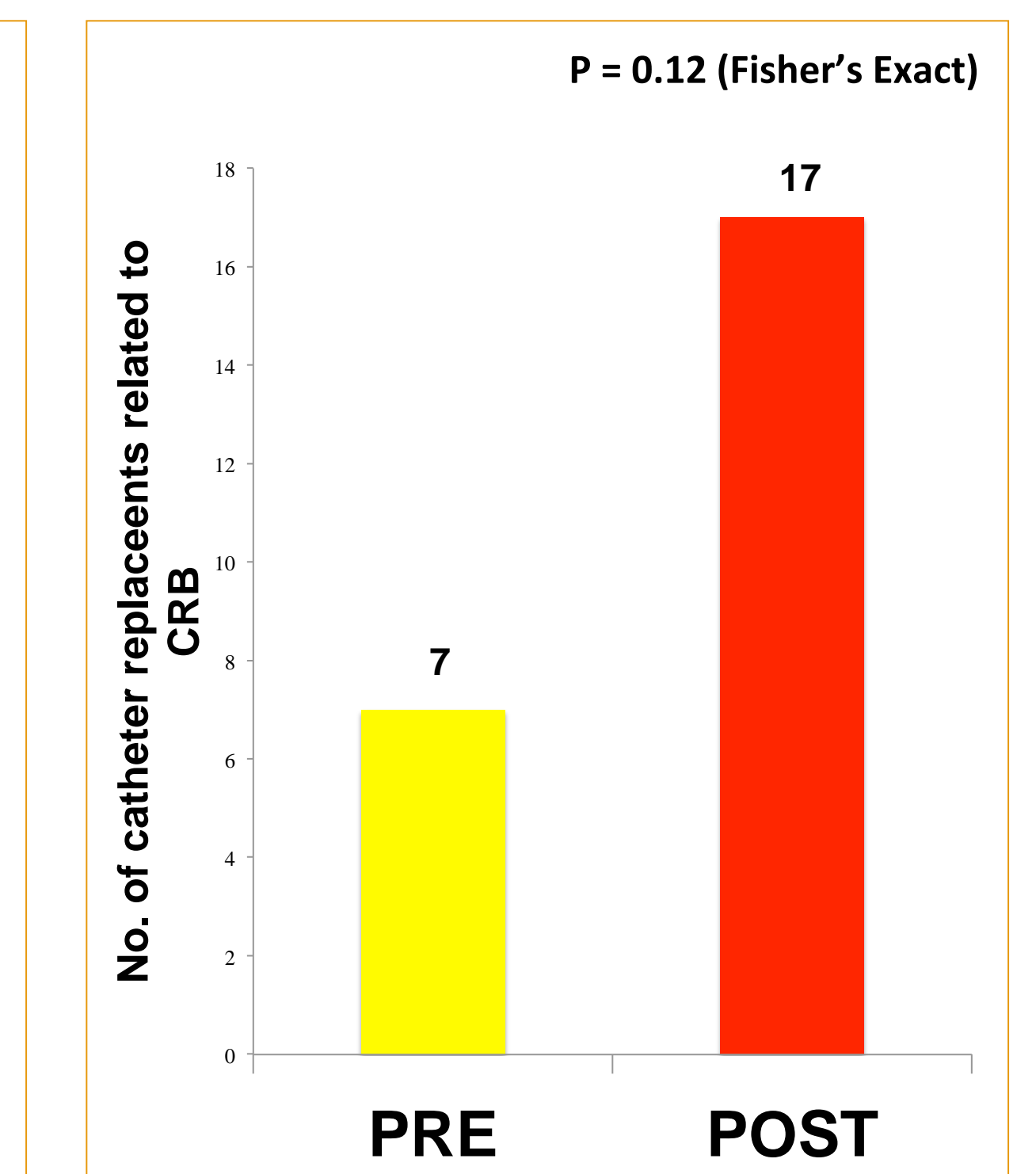


Figure 7: Catheter Replacements Related to CRB

Limitations

- Retrospective study
- Small sample size
- Baseline co-morbidities not captured, e.g., injection drug use, diabetes
- Inaccurate data entry in PROMIS renal database
- Data not captured when patients admitted to other hospitals

Conclusions

- Systematic and objective assessment of the catheter exit site using ESI screening tool at each HD run:
 - increased the number of swab specimens collected, antibiotic usage and antibiotic costs
 - did not significantly affect the incidence of clinically diagnosed ESI, CRB and CRB-related hospitalizations and catheter replacements.
- A one-time educational session may be insufficient to produce sustained improvement in swabbing techniques and swab culture interpretations
 - Need repeated educational sessions to reinforce learning and to capture all staff (including staff turnover)

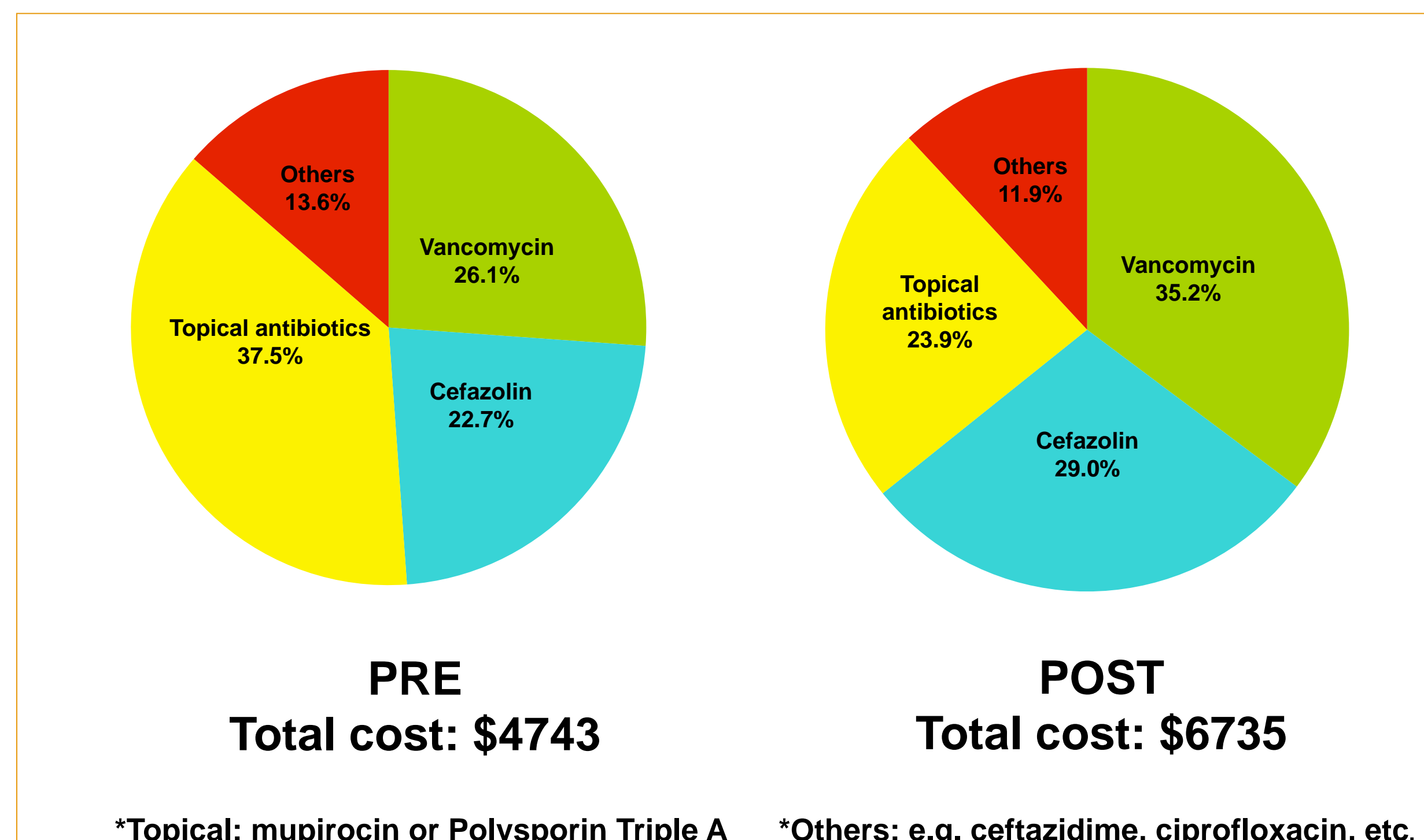


Figure 4: Use of Topical and Systemic Antibiotics

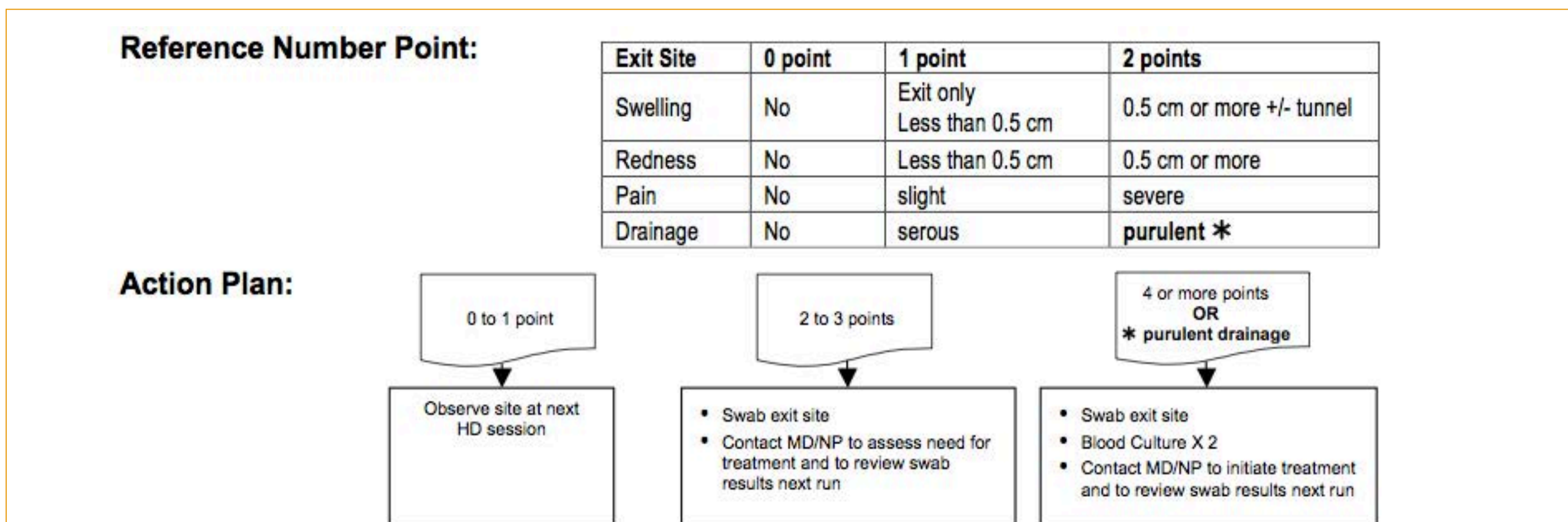


Figure 1: HD Catheter Exit Site Assessment Form

