

Using the plan–do–study–act model to convert to a new insulin delivery system

Hospital-targeted studies report numerous gaps in diabetes care and barriers to glucose management.^{1,2} In an effort to improve safe medication practices at The Ohio State University Medical Center, the plan–do–study–act (PDSA) cycle was employed to help nurses change from using insulin vials to patient-specific insulin pens in daily practice. The PDSA cycle for quality improvement, developed by Deming, is considered to be the scientific method used for action-oriented learning by the Institute for Healthcare Improvement.³ The PDSA cycle has been used to examine the effect of various educational strategies on process improvement and health outcomes.⁴

In the *plan* stage, the insulin pen task force (consisting of nurses, diabetes educators, pharmacists, and physicians) was responsible for the following goals: (1) to consider all insulin products on the formulary for insulin pen conversion, (2) to review the advantages and disadvantages of switching to insulin pens, (3) to review any safety concerns or issues that could be caused by converting to insulin pens, (4) to identify any obstacles that might be encountered during insulin pen transition, and (5) to develop an education

and training plan. The task force decided that nurse education materials would include handouts and hands-on training, with implementation occurring in three phases. Phase 1 was implemented in a 170-bed, community-based hospital; phase 2 was implemented in a specialty hospital with approximately 115 licensed beds; and phase 3 was implemented in a 765-bed, level-1 trauma center.

In the *do* stage, inservice education was conducted by representatives of the insulin pen and safety needle manufacturers on every nursing unit, during each shift, seven days a week. In addition, “demo kits” consisting of demonstration pens and needles were supplied to each nursing unit. Before implementing the inservice education program, a trial version was conducted with a group of 15 diabetes resource nurses to assess the time and to determine the content of the training session. The three phases of the inservice education program were completed in January, February, and April, 2007, respectively. The sales representatives provided a total of 315 inservice education sessions to the nursing staff. The sessions were advertised as mandatory by the unit managers.

During the *study* stage, feedback (oral and via e-mail) was solicited by nursing staff continuously to improve the inservice education program in latter phases.

During the *act* stage, the PDSA cycle helped to identify several areas for continuous process improvement to incorporate insulin pens into daily practice.

Upon completion of phase 1, nursing staff suggested a heavier focus on the injection technique during inservice education; the safety needle of the insulin pen should be injected at a 90° angle during subcutaneous injection.

Feedback upon completion of phase 2 included offering “drop-in” inservice education programs in addition to the unit-based program. It was requested to place the sales representatives in a central location for a designated block of time in an uninterrupted environment; this request was implemented in the phase 3 inservice education program.

After implementation, feedback from nursing staff and data from the internal event-reporting system and external sources (e.g., the Institute for Safe Medication Practices) led to ongoing inservice education with nurses focusing on administration technique and education to better address nurse perceptions. Some perceptions targeted during the training sessions included statements such as “the



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old needles were better” and “the insulin pens are wasteful.”

Changing practice by eliminating vials and replacing them with prefilled pens, as with any change in practice, is an ongoing challenge. The continuous feedback and improvement made the transition to a new insulin administration system successful through the use of the PDSA cycle.

1. Currie CJ, Kraus D, Morgan CL et al. NHS acute sector expenditure for diabetes: the present, future, and excess in-patient cost of care. *Diabet Med.* 1997; 14:686-92.
2. Sampson MJ, Brennan C, Dhatariya K et al. A national survey of in-patient diabetes services in the United Kingdom. *Diabet Med.* 2007; 24:643-9.
3. Cook CB, Jameson KA, Hartsell ZC et al. Beliefs about hospital diabetes and perceived barriers to glucose management among inpatient midlevel practitioners. *Diabetes Educ.* 2008; 34:75-83.
4. Institute for Healthcare Improvement. Improvement methods. www.ihl.org/IHI/Topics/Improvement/Improvement-Methods (accessed 2008 Oct 10).

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Structure of postgraduate year 1 pharmacy residency interviews

In 2003, Mancuso and Paloucek¹ conducted a survey of pharmacy practice residency programs accredited by the American Society of Health-System Pharmacists (ASHP) to assess the process used in evaluating residency candidates during interviews. Since this time, the number of ASHP-accredited residency programs has increased by over 60%. In addition, the granting of the bachelor of science in pharmacy degree was discontinued in favor of the doctor of pharmacy degree, and the pharmacy practice residency was converted to the postgraduate year 1 (PGY1) pharmacy residency.^{2,3} We conducted a study to determine if a standard exists among PGY1 residency programs regarding the interview process and to update the information provided by the Mancuso and Paloucek study.

A 37-question survey was created to gather information about the interview process at PGY1 pharmacy residency programs. The survey was posted online using a commercial Web-based survey tool. A link to the survey was e-mailed in November 2007 to the directors of all PGY1 programs listed with ASHP. This study received institutional review board approval.

Of the 544 programs that were sent a survey, 282 programs responded, resulting in a response rate of 52%. Many of these results were similar to those in the 2003 survey, including the types of

application materials utilized, involvement of current residents, and overall interview structure. The differences are highlighted below.

First, over 90% of the programs asked candidates about time management. Time management was ranked the most important area of focus during the interview, while questions relating to extracurricular activities ranked least important. Approximately 50% of programs asked clinical questions, including questions about drugs of choice (35%) or guidelines (21%). Other methods used to assess clinical knowledge included asking candidates to give case presentations (14%) or prepare subjective-objective-assessment-plan (SOAP) notes for a case (9%).

Approximately 27% of programs required a presentation during the interview. The majority of the programs allotted 15–29 minutes for the presentations and required candidates to use slides.

Another trend, not mentioned previously, was requiring a photograph of the candidate as part of the interview process, required by approximately 17% of the programs. A quarter of these programs obtained the photograph before the interview, and the remainder took a picture during the interview.

A number of our results were similar to those of the 2003 survey and were not