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# TEACHING SELF-ADMINSTRATION OF NASOGASTRIC TUBE INSERTION TO AN ADOLESCENT WITH CROHN DISEASE

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We examined the effectiveness of simulation training to teach an adolescent male with Crohn disease to self-administer nasogastric tube insertion. Nasogastric tube insertion was taught using simulation training, after which self-insertion skills were assessed. Results across skill components indicated that this subject was able to self-administer insertion of the nasogastric tube.

DESCRIPTORS: Crohn disease, nasogastric tube, simulation training

Management of Crohn disease may require daily nasogastric tube feedings to promote growth and to reduce the use of medical treatments (e.g., prednisone) that can produce adverse side effects. Patients with Crohn disease often need to insert a nasogastric tube daily. If a child is unable to insert the tube independently, the procedure must be performed by a parent or health care professional.

Simulation training has been used to teach medical self-management skills such as self-catheterization (Neef, Parrish, Hannigan, Page, & Iwata, 1989) and suctioning of tracheostomies (Derrickson, Neef, & Parrish, 1991). These studies demonstrate improved skills after simulation training and also suggest a reduction of failure during self-administration by detecting errors during simulation training (Neef et al., 1989). Standard clinical practice of teaching nasogastric tube insertion is done by training actual self-insertion and does not routinely involve simulation training. The purpose of this investigation was to extend research on simulation training for medical self-management to nasogastric tube insertion.

METHOD: *Subject.* Sam was a 17-year-old male with a 3-year history of Crohn disease. Nasogastric tube feedings were necessary to provide nutrition, to prevent an exacerbation of the disease symptoms, and potentially to induce a remission.

*Procedure.* A task analysis of nasogastric tube insertion skills was developed with a pediatric gastroenterology nurse for each of the three components associated with nasogastric tube insertion. (For a more detailed description of similar procedures, see Neef et al., 1989.) All training and probe sessions were conducted in Sam's hospital room. The first and the third authors independently scored each step of the task analysis (i.e., correct vs. incorrect). A correct score represented independent performance. An incorrect score included failure to attempt a step, inaccurate performance, or incorrect step sequence. Mean interobserver agreement, conducted for 92% of the sessions on a step-by-step basis, was at or above 96%.

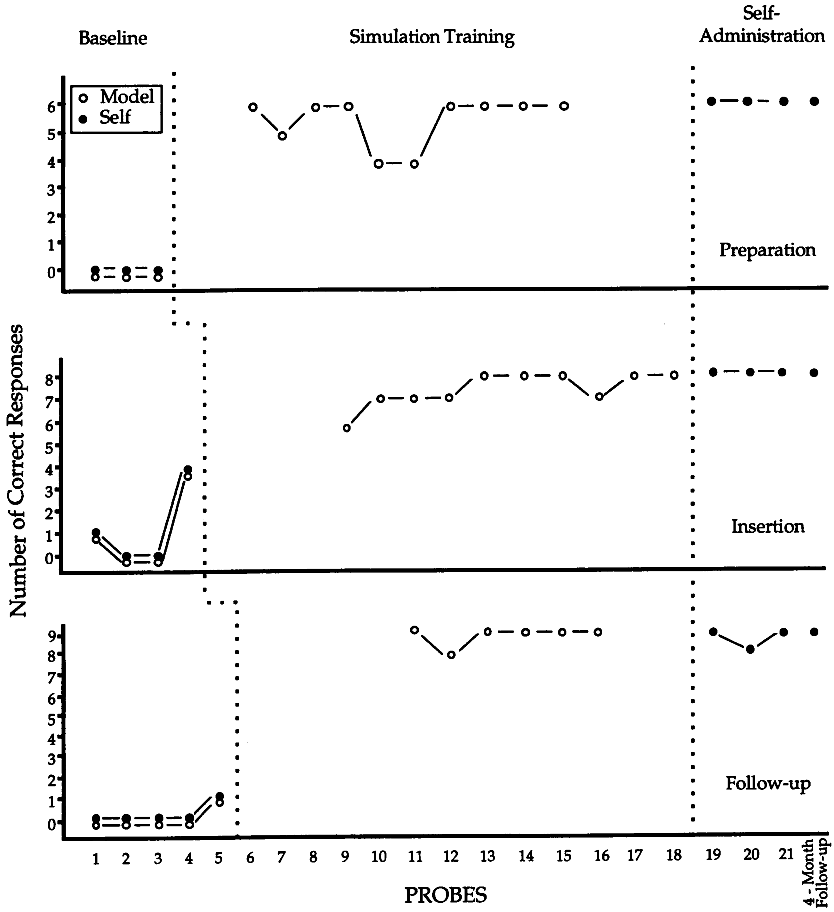
The task analysis of nasogastric tube insertion consisted of three basic skill components: (a) *preparation* (assembling supplies, measuring insertion length on tube), *insertion* (lubricating tube, stopping insertion at identified landmark), and *follow-up* (attaching syringe and injecting air). Intervention effects were evaluated with a multiple baseline design across skill components. A therapist informed Sam that he would be taught to self-insert a nasogastric tube, and that a simulated model would be used during the training process. Each baseline session consisted of Sam performing each of the three skill components on himself and the training model. Probes that assessed Sam's ability to self-administer the tube were conducted during baseline for experimental purposes only. These probes would not usually be conducted (prior to training) during routine clinical practice. A gastroenterology nurse was present during the probes to offer assistance, if needed.

Following baseline, Sam was trained to insert the nasogastric tube on the plastic model. He received specific instructions for each skill component and was allowed to observe the third author performing each skill on the model. During training sessions, Sam received verbal, gestural, and physical prompts if a step was omitted, completed incorrectly, or completed out of sequence. A least-to-most intrusive prompt hierarchy was used, and praise was given for correctly performing a step. Sam received training until a minimum of four training sessions were performed with 100% accuracy.

Sam was required to independently perform each of the steps in the skill component on the model on two consecutive probes before training advanced to the next skill component. During each training probe, Sam was asked to describe each skill component and was given no performance feedback or differential consequences. No probes were conducted during training. The number of training sessions and probes varied from one component to another, depending on Sam's performance. Sam performed the procedure on himself without feedback or reinforcement following the completion of training on all three skill components to allow assessment of the transfer of skills from simulation training with the model to self-insertion.

RESULTS AND DISCUSSION: The figure shows the number of correct responses across skill components using the model (open points) and during self-insertion probes (closed points). During baseline, Sam performed few steps correctly on the model or on himself. Following simulation training, he demonstrated competence with preparation, insertion, and follow-up (mean percentage correct was 92%, 93%, and 98%, respectively). However, the introduction of simulation training for preparation appeared to improve his performance on the insertion component. Sam then demonstrated corresponding self-insertion competence (100%, 100%, and 96%, respectively), demonstrating a transfer of skills from simulation training to performance on himself. Sam also demonstrated self-insertion mastery on the 2 days following training. Follow-up contacts made 4 months after his hospitalization indicated that Sam was continuing to implement the procedure accurately.

In the present case, the use of simulation training to teach an invasive medical procedure had a number of advantages noted by Neef et al. (1989); it appeared to promote actual skill acquisition, it may have helped to reduce anxiety or apprehension about performing an invasive medical procedure, and it permitted errors to be made on the model rather than on the patient. Finally,




simulation training is cost effective and time efficient and has potential for significant and long-lasting health benefits. In this study, self-administration of nasogastric tube feedings helped to induce the remission of Sam's disease and reduced the need for other costly treatments (e.g., prednisone or surgery).

## REFERENCES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