The Original Pink Tape®
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Latex Free • Zinc Oxide Based • Waterproof • Secure Adhesion • Easy Removal

Case Studies For Securing Devices/Delicate Skin

When dealing with tubes, devices and catheters, stabilizing and securing are critical. Hy-Tape does not compromise skin health as it adheres firmly to skin and devices. The Case Studies below are examples of how Hy-Tape made a difference during patient care.

Stabilizing Endotracheal Tube

Challenge

Endotracheal tubes require secure placement with a tape that will adhere in the presence of moisture yet remove easily without traumatizing the skin. Moisture from perspiration, diaphoresis, and respiratory secretions can cause curling and dislocation of most tapes. The skin under the tape often becomes macerated and susceptible to tearing. Many other tapes leave an adhesive residue after removal of the tape. This can cause additional harm, and may serve as a reservoir for bacteria, which Hy-Tape® does not do.

Solution

Hy-Tape®, The Original Pink Tape, is a unique water-resistant and washable tape especially suited for use with endotracheal tubes. It adheres to oily or hairy skin and remains intact in the presence of moisture until change is indicated. Its zinc oxide-based adhesive soothes the skin and aids in the reduction of injuries such as skin tears and tape burns. Hy-Tape® is particularly indicated for newborns and pediatric patients because it is so gentle to young skin. The zinc oxide adhesive can help reduce the chance of dermatitis or skin trauma.

A unique feature of Hy-Tape® that makes it work so well with endotracheal tubes is its elasticity, allowing accommodation to respirations decreasing the chance of skin damage or shift in tube position. Because it is waterproof, secretions may be easily cleansed without requiring a change of tape. Hy-Tape® is the ideal product when an adhesive or tape must remain on the skin for an extended period of time or when moisture is present.

Approximately 17-19 inches of tape is needed to adequately secure an endotracheal tube.

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Stabilizing Endotracheal Tube in the Neonate

Challenge

In the neonate, endotracheal tubes require secure placement with a tape that will adhere yet remove easily without traumatizing the infant's delicate skin. Moisture from perspiration, diaphoresis, and respiratory secretions can cause curling and dislocation of most tapes. The skin under the tape often becomes macerated and susceptible to tearing. In addition, many other tapes leave an adhesive residue after removal which can cause additional harm and may serve as a reservoir for bacteria, which Hy-Tape® does not do.

Solution

Hy-Tape®, The Original Pink Tape, is a unique water resistant and washable tape, especially suited for the tender skin of the neonate. It remains intact in the presence of moisture until change is indicated. The zinc oxide based adhesive soothes the skin, aids in the reduction of epidermal stripping, and reduces the risk of other injuries. Hy-Tape® is particularly indicated for newborns and pediatric patients because it is so gentle to young and immature skin.

A unique feature of Hy-Tape® that makes it perform well with endotracheal tubes is its elasticity which allows accommodation to respiration with minimal skin damage or shift in tube position. Because it is waterproof, secretions may be easily cleansed without requiring a change of tape. Hy-Tape® is the ideal product when a tape must remain on the neonate's skin for an extended period of time.

*Use caution when removing Hy-Tape® to reduce the potential for skin damage.

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Securing Epidural Catheter

Challenge

Stabilizing epidural catheters can be difficult with ordinary tapes. The ideal product must conform to body contours, resist rolling, adhere to oily or hairy skin and decrease friction even when applied to edematous regions. A tape must accommodate underlying tissue expansion or shrinkage, yet remain securely intact. Reducing skin trauma and minimizing dermatitis are other highly desirable qualities.

Solution

Hy-Tape®, "The Original Pink Tape®, is a waterproof, flexible tape. The zinc oxide adhesive is soothing to delicate skin and reduces the potential for maceration and trauma. It is easily applied to any part of the body and conforms to contours, making it ideal for hard-to-hold areas. It will not roll or detach from either the skin or a dressing. Hy-Tape® adheres well to oily or hairy skin. Because it adheres even when the skin is wet, it is particularly effective for diaphoretic patients, such as in labor and delivery. In addition, it is flexible and has memory; therefore, it will accommodate tissue expansion and contraction. Hy-Tape® will adhere in the presence of moisture from beneath or above its surface without slipping or detaching. It is occlusive and resists contamination by fluids or bacteria.

Approximately 18-22 inches of tape is needed securing an epidural catheter.

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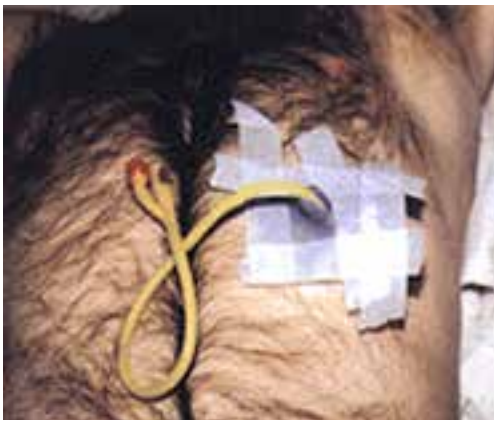
Securing Gastrostomy Tube



Challenge

N. is a 57-year-old male with ALS (Amyotrophic lateral sclerosis). He is ventilator dependent and has a gastrostomy feeding tube. Because he has a history of sensitivity to tapes and adhesives, we felt that Hy-Tape® would be an excellent choice for securing the gastrostomy tube. Prior to using Hy-Tape®, N, experienced so much discomfort when other tapes were removed that he was hesitant to try anything different. However, he consented to a trial with Hy-Tape®.

Where adhesives had previously been placed, his skin was irritated, inflamed, and painful. N. was a nursing care challenge because other tapes did not adhere and increased skin trauma, causing severe discomfort. Because he receives whirlpool baths twice weekly, a waterproof tape with an adhesive that helps prevent maceration seemed the ideal choice.

Solution

Because of the history of sensitivity to adhesives, we decided to first patch test with a piece of Hy-Tape®. There were no visible skin reactions or signs of inflammation after 72 hours.

We then used Hy-Tape® strips to secure the gastrostomy tube as well as other dressing and tubes. After long-term use there have been no skin eruptions, irritations, or physical discomfort for the patient. Hy-Tape® stabilizes the gastrostomy tube and holds firmly in the presence of moisture and drainage. We no longer have to change the tape after each whirlpool, reducing his pain and the cost of supplies. The tape conforms easily and adheres to oily or hairy skin. The zinc oxide adhesive is soothing to delicate skin and helps to reduce the risk of dermatitis and skin trauma. Drainage may be washed from the tape, yet it remains securely attached. Hy-Tape® removes with minimum trauma to the skin leaving little or no adhesive residue.

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Comparison of Nasogastric Tube Securing Methods and Tube Types in Medical Intensive Care Patients

By Suzanne M Burns, RN, MSN, RRT, CCRN, Marilyn Martin, RN, Valerie Robbins, RN, MSN, Theresa Friday, RN, Molly Coffindaffer, RN, BSN, Sandra C Burns, RN, BSN, and James E Burns, MD, MBA. From University of Virginia Health Sciences Center, Charlottesville, Va, and Virginia Department of Health, Culpeper, Va.

Background
Fecal collection pouches can be used successfully to manage bowel incontinence. However, the secure Nasogastric tube displacement can result in serious complications such as aspiration and inadvertent migration of the tube into the lungs. Replacement of the tubes is costly, time-and-›effort-intensive, uncomfortable for the patients, and potentially dangerous.

Objective
To determine the best of three methods for securing nasogastric tubes in a medical intensive care population and to identify variables related to the failure of tube securing methods.

Methods
A convenience sample of 103 patients requiring duodenal or standard gastric tubes for feeding, medication delivery, or decompression were randomly assigned to one of three taping methods: pink tape, clear tape, or “butterfly,” for a total of 264 taping episodes. Data collection included the mean time until failure of the securing methods as well as variables such as patient alertness and mobility.

Results
The mean time until failure was 100 hours with pink tape versus 56 hours with clear tape and 30 hours with the “butterfly.” Differences were significant. Duodenal tubes stayed secured longer than standard sump tubes (mean time until failure was 86 vs 41 hours) for all taping methods, but no significant relationship was demonstrated between mean time until failure and variables such as alertness, sedation, confusion, mobility, and the use of restraints.

Conclusion
Our results showed that the pink tape method was superior. Nasogastric tube securing methods in adult critical care patients vary in efficacy and should be selected carefully. (American Journal of Critical Care. 1995;4:198-203)

Although use of nasogastric tubes is common in critically ill patients, their placement can be uncomfortable, traumatic, time-consuming, and costly. Furthermore, displaced tubes usually have to be replaced. We designed a study to determine the best method for securing nasogastric tubes in our patient population and to identify the variables that affected failure of tube securing methods. Continue to next page....

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Conclusion Cont.

Our hypotheses were that the mean time until failure of our standard taping method would be less than for other selected taping methods; small-bore duodenal feeding tubes would stay secured longer than standard sump tubes; and factors leading to a short mean time until failure would include restlessness, confusion, and combativeness, whereas sedation, immobilization or paralyzation, and the use of restraints would favor a longer mean time until failure.

Background

Although numerous studies can be found describing use, placement, and assessment of nasogastric tubes, to our knowledge none have compared different securing methods for use in critically ill patients. For example, Metheny et al1 and Meer2 described the frequency of nasoenteral tube displacement and also identified associated risk factors such as confusion, restlessness, obtunded state, accidental dislodgment by staff, and severe coughing and vomiting. Eisenberg et al3 identified some patient characteristics that correlated with tube removal such as presence of head or neck trauma, sepsis, or cerebrovascular accident. Complications of tube displacement are many,1 3~5 yet little has been written about securing methods. To the authors' knowledge, a study by Sax and Bower6 was the only one that described a securing method for uncooperative patients. The method involved using two tubes sutured and looped into the nose and out of the mouth so that soft palate pressure resulted when the patient pulled on the tube. Although this method may be effective, it is extreme and obviously not a reasonable choice for most critically ill patients.

Methods

A convenience sample of all patients in the medical ICU of a 750-bed teaching hospital requiring nasogastric tubes for feeding, medication delivery, or decompression (N=103) was studied for 3 months in 1991-1992. Patients in whom tubes were secured by suture material were excluded, as were those with oral nasogastric placement and those with nasal skin breakdown. Subjects were randomly assigned to three securing methods that included

- **The "butterfly," a tube attachment device (Hollister Inc, Libertyville, Ill) that was our standard securing method**
- **Clear tape, an occlusive transparent dressing (Bioclusive; Johnson and Johnson Medical Inc, Arlington, Tex)**
- **Pink tape (Plastic Adhesive Tape; Hy-Tape® Surgical Products Corp, Yonkers, NY), commonly used in our critical care units**

The nasogastric tubes used in the study included Salem sump tubes (Sherwood Medical, St Louis, Mo), which were size 14F or greater, and small-bore duodenal tubes (Keofeed; IVAC Corp, San Diego, Calif, or Entriflex Dual Port Feeding Tubes; Biosearch Medical Products, Inc, Summerville, NJ). All duodenal tubes were size 12F and for ease of labeling were called KF (Keofeed) tubes.

Random assignment of the taping methods was done by the unit clerks, who blindly drew a colored chip, each representing a method, from a box at the desk when a nasogastric tube was placed. The clerks placed an information sheet, each colored to represent the corresponding chip and assigned method, in the nurses' bedside workbook. The front of the information sheet identified the securing method and described the appropriate skin preparation. Data collection information was on the back of the sheet (Table 1 on p.10 of the pdf).

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Methods

Individual inservices were given to all medical ICU nurses about the study, securing methods, and data collection. During these inservices, variables related to displacement were clarified. For the category titled “cognitive status,” the nurse was asked to record all variables that best described the usual cognitive status of the patient for the last 24 hours. Although it was acknowledged that cognitive status might change over time, we asked for this broad definition because similar definitions are usual in critical care environments and decisions related to care planning and interventions (ie, restraints and sedation) are based on such descriptions. Furthermore, we believed that descriptions of shorter time intervals (eg, 1 hour before tube placement and last 4 hours) were not inclusive enough and that we would lose characteristics that might predict securing method failures and ultimately tube displacement.

When a taping method failed and tube replacement was necessary, the nurses secured the tubes with the same securing method and completed the existing data collection sheet. A new sheet was started for each resecuring episode; thus, one patient could account for more than one taping episode. The definition of securing method failure was loose, partially adhered, or completely disengaged tape. Investigators reviewed each patient’s chart daily and updated the information sheets as needed. Because at least one investigator worked on each shift, they were often available to assist with questions and help other nurses. The taping materials were placed in a clear plastic bag in a standard position that was easily seen and accessible in patient rooms. The unit supply clerk was responsible for daily restocking.

Statistical significance was determined by the Mann-Whitney U test, with the Bonferroni correction (exceptions are indicated). This statistical method was selected because of the highly skewed nature of the data and to correct for multiple comparisons.

The skin surface was prepared by cleaning and drying the nose, applying a protective skin barrier (Skin-Prep; Smith and Nephew United, Inc, Largo, Fla) and allowing it to dry. Following confirmation of accurate tube placement, each tube was marked under the top of the nose by placing a half-inch wide strip of white waterproof tape (Kendall Products Co, Mansfield, Mass) around the tube twice, which helped with verification of tube position. The taping methods varied slightly and are described in Figures 1, 2, and 3.

Figure 1

Figure 2

Figure 3

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Results

Randomization resulted in assignment of 35 patients to the butterfly method, 33 to clear tape, and 35 to pink tape. There were 264 taping episodes, but because the butterfly method failed more frequently and reassignment was to the same method, the distribution to different methods varied (Table 2 on on p.11 of the pdf). Of the tubes, 67% were Salem sump and 33% were small bore duodenal tubes. One hundred eight episodes were eliminated from further analysis because the securing material was electively removed for a clinical procedure, the nasogastric tube was no longer required, or the patient was transferred from the study unit. This attrition further skewed the distribution of episodes by securing method (Table 3 on p.11 of the pdf).

The mean time until failure for the remaining 156 episodes by tube type are shown in (Table 3 on p.11 of the pdf). Mean time until failure for pink tape was 100 hours; clear tape, 56 hours; and butterfly, 30 hours. All differences were significant (pink tape vs clear tape, P=.012; clear tape vs butterfly, P<<.01; pink tape vs butterfly, P<<.01). No differences among securing methods were found when the reason for failure was patient self-extubation (clear tape, 4 out of 80; butter fly, 5 out of 106; pink tape, 3 out of 78).

The small-bore duodenal tubes stayed secured significantly longer than Salem sump tubes (mean time until failure, 86 vs 41 hours; P<<.01) and al though this difference was seen for all taping methods, as shown in (Table 4 on p.11 of the pdf), only the butterfly method demonstrated a significant difference between tube types (P<<.01). This finding, however, must be interpreted cautiously because some of the cell sizes were very small. When the mean time until failure for each securing method was compared for each tube type separately, the only significant differences were pink tape versus butterfly for Salem sump tubes (P<<.01) and pink tape versus clear tape for small-bore duodenal tubes (P<<.01).

Variables such as alertness, sedation, confusion, mobility, and use of restraints were not significantly related to displacement. When the mean time until failure was evaluated between nasogastric tube types in relationship to the respiratory device (nasotracheal tube, endotracheal tube, face mask, face tent, and tracheal collar), the numbers were too small for reliable analysis.

Discussion

The results of this study supported our first two hypotheses. The pink tape method was superior to the other two methods for our medical ICU patients, and small-bore duodenal nasogastric tubes stayed secured longer than Salem sump tubes. When variables related to failure were evaluated, no significance was demonstrated; however, there was a trend toward longer securing times when the patient was sedated, and a tendency toward shorter securing times when restraints were used. Although our third hypothesis, related to factors that favor longer securing times, was not supported, nurses should continue to be especially vigilant with patients who are restless, confused, or combative. A larger sample size may have demonstrated differences in these variables.

Studies such as those done by investigators 1-3 who studied nasogastric tube displacement rather than securing method failure are difficult to compare with this study, because the primary outcome variable (displacement vs securing failure) was different. It is likely, however, that the two are related. In our study population there were only 12 episodes of patient self-extubation. Continue to next page...

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Discussion Cont.

The increased vigilance associated with the study protocol possibly prevented self-extubation. Another explanation is that the increased care and attention given to securing material application resulted in better overall tube adherence. Although the total number of nasogastric tube self-extubations was small, 8 of the 12 patients who self-extubated were confused. Studies are needed to further explore the relationship between confusion and self-extubation.

The pink plastic tape is elastic and tends to become “gummy” after prolonged use, encouraging retaping. Possibly, these properties of the pink tape help in preventing total securing failure. The other materials studied were much less flexible and tended to fail totally (butterfly) or tear (clear tape) rather than stretch. The tapes were skin-toned (pink tape and butterfly) or clear (clear tape); therefore, it is unlikely that securing times were adversely affected because the securing method colors were annoying to the patient. The piece of white tape wrapped around the nasogastric tube at the tip of the nose, which was used to mark tube placement and help with accurate and early identification of nasogastric slipping or dislodgment, may have enhanced the adherence of the securing materials to the nasogastric tubes.

The finding of longer securing times with the duodenal tubes versus the standard Salem sump tubes is not surprising, because the Salem sump tubes are more rigid and larger than the feeding tubes, increasing discomfort leading to their dislodgement.

Nasogastric tube replacement is costly, dangerous, and time-consuming. We must continue to explore safe and pain-free methods to secure nasogastric tubes in critically ill patients to ensure quality outcomes.

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Table 1: Nasogastric Taping Method Assessment

Patient Name _____ History Number _____

1. Circle/check all that apply
2. Complete one sheet for each securing episode
3. Make additional notes as necessary on this form

Type of Tube _____ Date & Time _____

Securing Method Done

Salem Sump _____ Initial _____ Keofeed _____
How was tube placed:
Nasal / Oral (circle)

Patient's Cognitive Status (usual)

Alert _____ Alert/oriented _____ Confused _____
Combative _____ Restrained _____ Comatose _____
Chemically paralyzed / sedated (circle)

Patient's Respiratory Status

Intubated orally _____ Intubated nasally _____ Trached _____
Mechanically ventilated _____ 0_2 (other) _____

Unsecured Tape Documentation

Date & Time Tape Unsecured _____

Reason For Unsecured Tape

Inadequately
Secured _____ Reason _____
Moisture _____ Reason _____

Tape Failed To

Stay Secured _____ Reason _____
Nurse DC'd _____ Reason _____
Other _____ Reason _____

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Table 2

Frequency Distribution Of Taping Methods (All Episodes)		
Method	Number	%
Pink Tape	78	29.5
Butterfly	106	40.2
Clear Tape	80	30.3
Total	264	100

Table 3

Securing times Compared By Method				
Method	N (%)	MTUF	SD	95% CI
Pink Tape	36 (28)	100.48	87.2	71-130
Butterfly	76 (49)	29.87	26.2	24-36
Clear Tape	44 (28)	56.48	50.6	41-72
Total	156			

Table 4

Securing Times Compared By Method				
	Pink Tape	Butterfly	Clear Tape	All
Salem Sump (n)	22	71	19	112
MTUF (Hours)	87.2	26.6	41.4	41.1
96% CI	42.8-131.6	21.4-31.9	27.2-55.7	31.0-51.2
Small-bore duodenal (n)	14	5	25	44
MTUF (hours)	121.3	75.5	67.9	85.8
95% CI	87.3-155.4	28.7-122.4	43.1-92.7	67.0-104.5
MTUF, mean time until failure; CI confidence interval.				

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