

Decreasing Hospital Transfers in the Skilled Nursing Setting Utilizing a Rectal Administration Catheter for Treatment of Changes in Patient Condition: A Preliminary Case Series Study

Summary: In this case series review, a specialized rectal administration catheter provided effective short term hydration in all patients. The catheter intervention was successful in avoiding emergency room or hospital transfers in 7 of the 9 (78%) patients with conditions deemed serious enough to mandate hospitalization if not treated within the facility. The 6 patients able to self-report comfort of the hydration procedure reported hydration via the catheter as very comfortable (5 on a scale of 1 – 5). Staff reported high satisfaction using the catheter in all cases.

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Introduction

Skilled nursing facilities (SNFs) are facing numerous challenges in today's changing healthcare climate. The shift from traditional fee-for-service payment to value-based purchasing models and quality of care models is raising the bar on agencies to achieve higher quality metrics. One of the biggest challenges facilities face with the new reimbursement models is increased pressure to lower the rate of hospital transfers and emergency room visits. An increase in patient acuity resulting in more complex and costly care is making this even more challenging.ⁱ To decrease the incidence of emergency room visits and hospital transfers, facilities need to treat more patient changes in condition within the facility. Innovation that can treat these changes in condition, improve quality metrics, and reduce unnecessary hospital transfers in a safe, easy and cost effective manner is of great import.

This paper presents the results of a pilot trial describing the first use of a specialized rectal administration catheter (Macy Catheter: Hospi Corporation) as an option to treat changes in patient condition in the SNF setting. In a pilot trial at four skilled nursing facilities the intervention facilitated safe, fast and easy enteral hydration and medication delivery via the rectal route, treating changes in patient condition while avoiding the need for parenteral therapy and hospital transfer in a majority of patients.

Background

The acute loss of oral intake and the consequent inability to provide hydration and/or medication via the oral route is one of the biggest challenges to managing changes in patient condition within the facility. In 2012, there were approximately 375,000 hospital admissions and 550,000 emergency visits for dehydration that were considered potentially preventable.ⁱⁱ Infection, fever, lethargy, agitation, delirium, nausea and vomiting are examples of changes in condition that may lead to loss of oral intake. Unless a patient has a percutaneous endoscopic gastrostomy (PEG) tube or nasogastric (NG) tube in place, the alternative route of fluid and medication delivery has historically been parenteral.

There are many challenges associated with parenteral therapy. The insertion of an IV can be difficult or contraindicated in many elderly patients. In skilled nursing settings staff do not always have the skill set to insert an IV on difficult venous access patients. Even in the



emergency room setting with daily practice there are over 5 million patients annually for whom IV access is impossible.ⁱⁱⁱ Due to lack of on-site expertise many SNFs contract out their IV placement services, a costly alternative that can delay treatment for hours.

Parenteral therapy is nearly impossible to initiate and manage in agitated or non-cooperative patients and can lead to injuries and increased use of restraints. Infection, occlusion, infiltration and injury from dislodging needles can lead to an increase in nursing time, reportable infections, and hospital transfers. In addition, parenteral therapy is relatively expensive and time consuming to initiate and maintain. While subcutaneous hydration (hypodermoclysis) is preferred over IV hydration by some facilities, the rate of infusion is usually limited to about 60ml/hr, as more rapid infusion rates can cause discomfort and swelling in the subcutaneous tissue around the infusion area.^{iv}



Purpose and Aims

The purpose of this pilot trial was to evaluate the feasibility of utilizing a rectal administration catheter (Macy Catheter, Hospi Corporation) in the SNF setting for the administration of fluid and medication when the oral route was not an option, and to assist in preparation and future design of a larger, more rigorous study protocol to follow. The primary aims were to evaluate this method of fluid and medication delivery for; 1) short term (acute) hydration; 2) delivery of needed medications and; 3) the ability to decrease emergency department and hospital transfers. The secondary aims were to evaluate; 1) patient comfort with insertion and medication and fluid delivery via the rectal administration catheter and; 2) facility satisfaction with the use of the catheter.

Methods

DESIGN

A pretest-posttest intervention study design was used to evaluate the feasibility of using a rectal administration catheter in the SNF setting to manage changes in patient condition when the oral route has been compromised due to acute cognitive and/or physical conditions and evaluate the impact on the incidence of ED and hospital transfers in these patients.

SETTING/SUBJECTS

This study included 4 SNFs in central Texas licensed to care for between 100 to 125 patients each. Primary nursing care services were delivered to patients by the facility staff, and supported medically by CarePoint staff in collaboration with the attending physician. Patients were screened for inclusion between November 1 and December 31, 2016.

OUTCOME MEASURES

Baseline descriptive and demographic data were collected from each patient's medical record including key clinical information (e.g. primary diagnosis, comorbid conditions). The post-intervention survey documented the specific hydration orders and the medications given via the catheter. In addition, it recorded outcomes including whether hospital or emergency department transfer were avoided, the comfort of hydration via the catheter and satisfaction with use of the catheter by the clinician. Both comfort and satisfaction were measured with Likert scales measuring 1 to 5. The comfort Likert scale was rated as 1 being the "very uncomfortable" and

5 being "very comfortable". The "satisfaction" Likert measures as 1 being "very dissatisfied with use" and 5 being "very satisfied with use".

THE RECTAL ADMINISTRATION CATHETER

Proctoclysis was administered with a specialized rectal administration device (Macy Catheter, Hospi Corporation) specifically designed and FDA cleared for fluid and medication delivery. The catheter consists of a 14fr, silicone shaft with a 15ml retention balloon on one end and a balloon inflation port and medication/fluid administration port on the other. The catheter is placed in the distal 1/3rd of the rectum, immediately adjacent to the internal rectal sphincter (figure 1). The catheter can remain in the rectum for ongoing fluid and medication delivery for up to 28 days, and is either removed or expelled when a patient needs to defecate. The catheter can then be reinserted as many times as necessary during the 28-day period. Insertion of the catheter is a simple procedure that takes less than 5 minutes and can be performed by both RNs and LVN/LPNs. The catheter is lubricated, inserted to the marker line, and the balloon is then inflated to 15ml. After insertion, the catheter is secured to the patient's leg or abdomen.

The catheter was utilized as an alternative to parenteral fluid and medication delivery in patients whose oral route had been acutely compromised. The CarePoint APNs provided the facility with orders to initiate the Macy Catheter for hydration and/or medication administration in collaboration with the attending physician and provided the facility staff with ongoing educational clinical support through the adoption process.

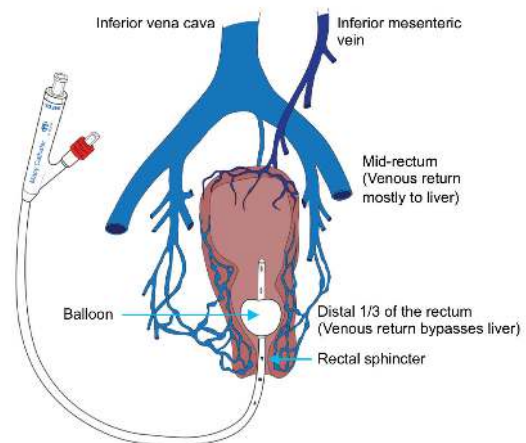


Figure 1: The Macy Catheter showing placement in the distal 1/3rd of the rectum.



Results

During the evaluation period, 10 patients were screened for inclusion with 10 (100%) agreeing to participate, and one patient receiving the catheter on two separate occasions for a total of 11 uses. Nine of the 11 catheter interventions (82%) facilitated successful management of the patient's change in condition within the facility. Two patients had conditions that mandated an ED visit even though hydration via the catheter had been successful (table 1).

Five of the 11 interventions were for both hydration and medication administration with the remaining 6 being for hydration only. All 10 patients tolerated the intervention well in all 11 uses, with no signs of discomfort or expulsion of fluid. Hydration was considered successful in all 11 instances (100%) based on either normalization of vital signs or decrease in lethargy and an ability to return to oral rehydration and medication administration. Table 2 lists the medication and hydration protocols used for each patient. In all instances, regular tap water was utilized, with hydration rates varying from 75ml/hr to 250ml/hr for various durations. Some infusions were given as boluses at specified time periods with a 60ml enteral syringe, which is provided in the catheter tray by the manufacturer. Others were given as infusions using a standard feeding tube bag which fits onto the administration port of the catheter.

Variables	N	%
PATIENT DEMOGRAPHICS		
Age		
<65	2	20%
65-75	1	10%
76-85	2	20%
>85	5	50%
Gender		
Male	4/10	40%
Female	6/10	60%
Race		
Black or African American	1/10	10%
Hispanic, Latino, Spanish Origin of any race	1/10	10%
White	8/10	80%
Primary Diagnosis		
Cardiac	2/10	20%
Renal	2/10	20%
Neurological disorder	4/10	40%
Hepatic	2/10	20%
Condition and DNR Status		
Transfer to ED/hospital indicated if clinical condition not treated	9/11	82%
DNR/ "Do not Hospitalize"	2/11	18%
CATHETER USE		
Hydration only	6/11	55%
Hydration with medication admin.	5/11	45%
CLINICAL CHANGE IN CONDITION		
Dehydration	10/11	91%
Lethargy	4/11	36%
Urinary tract infection	2/11	18%
Nausea/vomiting	2/11	18%
Tachycardia	1/11	9%
OUTCOMES		
Intervention facilitated management of change in condition within SNF	9/11	81%
ED or hospital transfer avoided	7/9	78%
Patient self-report of comfort "very satisfied"	7/7	100%
Staff report of patient comfort "very satisfied"	4/4	100%
Staff satisfaction in use "very satisfied"	11/11	100%

Table 1

Clinical Change in Condition	Catheter Use	Hydration Orders	Duration	Age/Gender
Dehydration, lethargy	Hydration	H ₂ O at 100ml/hr	10 hours	87/f
Dehydration, UTI, hematuria	Hydration / Medication	H ₂ O at 150ml/hr	48 hours	88/m
Dehydration, lethargy	Hydration	H ₂ O at 250ml/hr	2 hours	58/f
Dehydration, lethargy	Hydration	H ₂ O at 250ml/hr	2 hours	58/f
Dehydration, lethargy, N/V	Hydration / Medication	H ₂ O at 60ml bolus Q 15 min	2 hours	89/f
Dehydration	Hydration	H ₂ O at 100ml/hr	6 hours	100/f
Dehydration, UTI, fever, tachycardia, lethargy	Hydration / Medication	H ₂ O at 75ml/hr	48 hours	64/m
Dehydration	Hydration	H ₂ O at 100ml/hr	48 hours	96/m
Dehydration, N/V	Hydration / Medication	H ₂ O 60ml bolus Q 20 min until BP 120/80	1 hour (sent to ER)	44/m
Dysphagia	Hydration / Medication	H ₂ O at 60ml bolus 3 x daily	Ongoing	82/f
Dehydration, hypotension	Hydration	H ₂ O 60ml bolus Q 20 min until BP 120/80	30 min (sent to ER)	66/m

Table 2



Comfort and Satisfaction Outcomes

Of the 6 patients (7 uses) without cognitive deficits who could self-report comfort, all patients reported a 5 (very comfortable) on a 1 to 5 Likert scale with each use. Staff assessed no signs of discomfort in the 4 patients who were unable to self-report. Patients appeared to tolerate the procedure well with no signs of discomfort or expulsion of hydration fluid. The staff rated “ease of use” as a 5 (very easy to use) on a 1 to 5 Likert scale in all uses. One patient reported not being able to feel the placement of the catheter or the hydration procedure.

Avoiding ED and Hospital Transfer

The APN and attending physician who performed the prospective chart reviews deemed the patient’s change in condition was serious enough in 9 of the 11 uses to warrant hospital, and/or ED transfer if the condition were not treated at the facility. Seven of these 9 patients (78%) avoided a hospital transfer after successful treatment protocols via rectal administration catheter. Two patients had “Do Not Hospitalize” orders on their charts, and while their change in condition was successfully managed in the facility, they would not have been hospitalized for the condition change. Two patients were transferred to the ED due to conditions that mandated emergent treatment (e.g. atrial-fibrillation conversion, acute renal failure).

Discussion

SOLVING THE PROBLEM

In response to the challenge of increasing acuity of patients and the need to reduce unnecessary hospital transfers, numerous programs have emerged to assist skilled nursing facilities in managing changes in patient condition within the facility and provide better care. The INTERACT Quality Improvement program created by Dr. Joseph Ouslander and his team at Florida Atlantic University is one of the most extensively used of these programs. Ouslander et al. demonstrated a 17% decrease in hospitalizations in 25 skilled nursing facilities that implemented the INTERACT II Quality Improvement program.^v The program provides care paths and other tools to assist facilities in assessing and managing changes in patient condition within the facility, avoiding unnecessary hospital transfers and providing better care.^{vi} The care paths provide a guide for proper monitoring of conditions and managing conditions within the facility when appropriate, including when to initiate hydration and certain medication protocols. When patients cannot

be hydrated or medicated due to difficulties associated with parenteral access, even the best treatment pathway cannot or will not be followed by the facility, likely leading to an admission or ED visit. The Macy Catheter may be able to assist facilities in the ability to execute these care paths successfully in a greater number of patients by facilitating quick, easy and less costly hydration and medication management.

PREVIOUS LITERATURE ON RECTAL ADMINISTRATION OF FLUIDS AND MEDICATIONS

Several studies done on rectal hydration and micro-enema medication administration through a rectal administration catheter have demonstrated comfort and effectiveness. A crossover study done by Lam et al. comparing the early absorption profile of phenobarbital in suppository vs. micro-enema via the Macy Catheter showed faster, more reliable and improved absorption of phenobarbital in micro-enema form vs. suppository. Medication administration was reported by subjects as “not uncomfortable” via the catheter compared to suppositories, which were reported as “mildly uncomfortable” ($P < 0.05$).^{vii} In a case study on a hospice patient done by Paez et al., rectal administration of palliative medications via the catheter provided an effective alternate to parenteral administration. The authors reported the catheter allows the hospice team to provide the most rapid symptom management possible by facilitating use of medications already at the bedside via the catheter avoiding a lag time associated with preparation, delivery and setup of parenteral or other compounded medication.^{viii}

Studies on the use of the catheter in the emergency and acute settings have demonstrated success in controlling symptoms and hydrating patients when intravenous access is difficult or not indicated, or when medications not available in parenteral form are needed in non-oral patients.^{ix,x}

Bruera et al. demonstrated that proctoclysis with tap water through a rectally inserted tube was well tolerated in 78 patients receiving palliative care services. The study subjects received hydration at a rate of 250ml/hr +/- 63ml/hr, and received an average of 1038ml +/- 202ml each 24-hour period for a period of 15+/-8 days.^{xi}



COST IMPLICATIONS

A formal cost comparison of rectally administered fluids to parenteral delivery was not performed in this study. The cost of the Macy Catheter tray is under \$100 which includes all supplies to place the catheter and administer fluids and medications. The use of the catheter would therefore be less expensive than losing a patient to a hospital transfer for one day. In this case study series, tap water was used for hydration and the catheter avoided additional costs normally incurred using the parenteral route; sterile IV fluids and/or medications, pumps, IV catheters, tubing and dressing change trays.

STUDY LIMITATIONS

In this pilot trial, the sample size was too small to statistically analyze the data gathered. Additionally, both the SNF's bedside nurses and APNs gathering the outcomes data were directly involved in the patient care and in implementation of the catheter intervention. Furthermore, the intervention was not compared to a control group receiving usual care. The study population is not generalizable, as we used convenient sampling and only covered one city within one state. To examine the sustained effect, the study needs to be carried out in multiple SNFs with an adequate sample size. A more rigorous study is in the planning stages that will include a larger patient population, more skilled nursing settings, and independent data collection from clinicians trained in research methodology who were not involved in the direct care of the patient.



Conclusion

In this case series review, a specialized rectal administration catheter provided effective short term hydration in all patients. The catheter intervention was successful in avoiding emergency room or hospital transfers in 7 of the 9 (78%) patients with conditions deemed serious enough to mandate hospitalization if not treated within the facility. The 6 patients able to self-report comfort of the hydration procedure reported hydration via the catheter as very comfortable (5 on a scale of 1 – 5). Staff reported high satisfaction using the catheter in all cases.

The use of a specialized rectal administration catheter in the skilled nursing setting may offer a safe, easy, comfortable and cost effective alternative to intravenous, subcutaneous and other enteral options such as feeding tubes and NG-tubes for hydration and medication administration. Because of these benefits, the intervention may allow for treatment of more patient changes in condition in the skilled nursing facility, decreasing emergency room visits and hospital transfers and improving the overall quality of care within the skilled nursing setting.

REFERENCES

- ⁱ Tyler DA, Feng Z, Leland NE, Gozalo P, Intrator O, Mor V. Trends in Post Acute Care and Staffing in US Nursing Homes, 2001-2010. *Journal of the American Medical Directors Association*. 2013;14(11):10.1016/j.jamda.2013.05.013. doi:10.1016/j.jamda.2013.05.013.
- ⁱⁱ Fingar K, Barrett M, Elixhauser A, Stocks C, Steiner C. Trends in Potentially Preventable Inpatient Hospital Admissions and Emergency Department Visits: Agency for Healthcare Research and Quality; Statistical Brief # 195: November 2015
- ⁱⁱⁱ Fields, M et al. Risk factors associated with difficult venous access in adult ED patients. *The American Journal of Emergency Medicine*, Volume 32, Issue 10, 1179 - 1182
- ^{iv} Sasson M, Shvartzman P. Hypodermoclysis: An Alternative Infusion Technique. *American Family Physician* 2001; 64;(9): 1575-1578
- ^v Ouslander JG, Lamb G, Tappen R, et al. Interventions to Reduce Hospitalizations from Nursing Homes: Evaluation of the INTERACT II Collaborative Quality Improvement Project. *J Amer Geriatr Soc*. 2011;59:745-753.
- ^{vi} Ouslander J. et al. The Interventions to Reduce Acute Care Transfers (INTERACT) Quality Improvement Program: An Overview for Medical Directors and Primary Care Clinicians in Long Term Care. *Journal of the American Medical Directors Association*. 2014; 15(3): 162-170
- ^{vii} Lam Y, Lam A, Macy B. Pharmacokinetics of phenobarbital in micro- enema via Macy Catheter versus suppository. *J Pain Symptom Manage*. 2016;51(6):994-1001.
- ^{viii} Paez K, Gregg M, Massion C, Macy B. Promoting Excellence in Symptom Management Case Series: Case Study: A New Intervention for Rapid End-of-Life Symptom Control in the Home Setting. *Journal of Hospice & Palliative Nursing*: 2016 Dec;18(6):498-504.
- ^{ix} Lyons N, Nejak D, Lomotan N, et al. An alternative for rapid administration of medication and fluids in the emergency setting using a novel device. *Am J Emerg Med*. 2015;33:1113.e5-1113.e6.
- ^x Honasoge A, Parker B, Wesselhoff K, Lyons N, Kulstad E. First use of a new device for administration of buspirone and acetaminophen to suppress shivering during therapeutic hypothermia. *Ther Hypother Temp Manag*. 2016;6(1):48-51
- ^{xi} Bruera E, Pruvost M, Schoeller T, Montejo G, Watanabe S. Proctoclysis for Hydration of Terminally Ill Cancer Patients. *Journal of Pain and Symptom Management*. 1998;15(4):216 - 219):498-504.

