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**Standardizing Discharge Practices for Pediatric Urology Outpatient
Procedures: A Quality Improvement Project**

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Bachelor of Science in Nursing, Central Methodist University, 2016

A Dissertation Submitted to the Graduate School at the University of Missouri-St. Louis
in partial fulfillment of the requirements for the degree
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Abstract

Background: Standard discharge instructions of verbal and written methods are only understood by about 45-50% of caregivers. Video discharge instructions (VDIs) in addition to standard methods of verbal and written instructions can be very effective for caregiver comprehension (CC), retaining discharge education information and improving patient outcomes. **Problem:** In an outpatient surgery department in a Midwestern Children's hospital, 100% of the discharge instructions for pediatric urology outpatient procedures are different than the instructions given to caregivers by the surgeon. **Methods:** The study utilizes a descriptive evaluation of change in how discharge instructions were written and provided. **Interventions:** Updated discharge handouts and corresponding VDIs were created and replaced outdated, standard methods (verbal and written) of discharge teaching for pediatric urology outpatient surgeries. Data was collected via two surveys, one completed prior to discharge on the day of the procedure and the second completed by a phone call two weeks after the procedure. **Results:** All videos were highly effective in providing consistent instructions among providers, high levels of CC, and low levels of adverse events after discharge. There were no statistically significant differences between the four videos when comparing consistency of discharge information among providers, CC, and adverse events after discharge. **Conclusions:** In pediatric patients having urological outpatient procedures, standardized discharge instructions with educational videos are highly effective in providing consistent discharge information, high levels of CC, and preventing adverse events during a two-week period after hospital discharge.

Keywords: standardizing; discharge; pediatric; urology procedures; quality improvement

Standardizing Discharge Practices for Pediatric Urology Outpatient Procedures: A Quality Improvement Project

The quality of patient education given to caregivers after discharge from a hospital setting plays a critical role in a child's recovery and overall health. Low quality discharge instructions result in poor treatment compliance, inadequate follow-up care, increased hospital readmission rates, added expenses for families and healthcare institutions, and decreased patient satisfaction (Wood et al., 2017). Similarly, low caregiver comprehension (CC) of discharge instructions is associated with worsened clinical outcomes (Uong et al., 2021). Improving the quality of discharge practices allows providers to directly improve patient's quality of care and health outcomes. As a multifactorial concept, CC of discharge instruction requires special consideration from the health care team due to variability of learning types, literacy levels, and other individual healthcare factors.

Significantly, Uong et al. (2021) found more than 70% of caregivers lack full understanding of instructions leading to the inability to recognize signs and symptoms requiring medical attention after discharge. Verbal instructions limit the caregiver ability to ask questions, whereas written instructions often overestimate literacy levels and use medical jargon causing caregiver confusion (Wood et al., 2017). Wray et al. (2021) found standard discharge instructions, verbal and written methods, are only understood by about 45-50% of caregivers. Time constraints experienced by nurses and physicians lead to less time for questions, decreased patient and caregiver understanding, decreased treatment compliance, decreased follow-up, increased 14-day hospital readmission rates, and decreased patient satisfaction (Wray et al., 2021). Because about 20% of pediatric

patients discharged from the hospital experience post-discharge complications, it is important to give consistent, quality caregiver education to improve the hospital-to-home transition (Desai et al., 2018).

In an outpatient surgery department in a Midwestern Children's hospital, discharge instructions in patient electronic medical records (EMRs) for pediatric urology outpatient procedures are different than the instructions given to caregivers by the surgeon. Currently, 100% of the discharge instructions uploaded to EMRs for outpatient urological procedures for pediatric patients have different information than what the surgeon communicates to caregivers. Current discharge handouts range from 8-18 pages and include repetitive, unnecessary information. Newly implemented discharge handouts will be two pages. The purpose of this project is to standardize post-operative discharge instructions for pediatric urology outpatient procedures. This project aims to standardize instructions through the use of video education tools, written instructions, and verbal discussion of questions to improve CC, consistency among providers, and decrease adverse events after discharge. Outcomes measures are CC, consistency among discharge instructions from nursing and physicians, and adverse events experienced after discharge from the hospital. A PICOT study question formed to guide the project is: In pediatric patients having urological outpatient procedures, how effective are standardized discharge instructions with educational videos in providing consistent discharge information, high levels of CC, and preventing adverse events during a two-week period after hospital discharge?

Review of Literature

The review of literature begins with an explanation of the literature search used to

find the 12 publications discussed in this section. The paper will then examine individual studies to determine the importance of quality patient education and identify recommendations. Studies that investigated the effectiveness of written and verbal instructions will be described followed by the literature on the use of VDIs in discharge education with pediatric patient caregivers. Post-discharge adverse events related to CC will also be examined. Well-known concepts and gaps in the literature will be identified, and the Plan-Do-Study- Act model used to guide the project will be discussed.

The review of the literature began with a Summon Search of the UMSL Library's online databases. Key words used were "standardiz* "discharge instructions" video pediatric* caregivers" and yielded 81 results. Five of the 81 results were chosen for review. Similar searches were applied to three other databases including CINAHL, MEDLINE, and PubMed.

Key words in CINAHL were "discharge instructions", "video", and "pediatrics" with "AND" as the Boolean operators. Three out of five total results were chosen for review. Key words in MEDLINE were "discharge instructions", "video", and pediatrics or children" with "AND" as the Boolean operators. Two of the eight results were selected for review. Multiple searches were conducted on PubMed. The first search used keywords "discharge instructions", "video", and pediatrics or children" with "AND" as the Boolean operators and yielded 44 results. One article was chosen for review. Refined to "discharge education" AND "video" AND "urology" with "AND" as the Boolean operators, the search generated six results and one was chosen for review. Lastly, a PubMed search with key words "standardization of video discharge instructions" yielded 55 results, of those results, one was chosen for review.

Inclusion criteria used to select the articles were pediatric patients, video discharge instruction (VDI) methods, and hospital or acute care settings. Exclusion criteria included articles older than 10 years, those not involving VDIs specifically, and articles not involving at least two of the three main concepts: pediatric patients, VDIs, or urologic procedures. No results were found for all three concepts: VDIs in pediatric urology patients. Gaps in the literature include studies involving all three concepts, adverse events after discharge as reported by caregivers, and the effect of inconsistency in discharge education among different providers. The literature review contains 12 publications selected based on the above criteria.

Poor CC of discharge instruction leads to adverse events after hospital discharge, especially in pediatric populations who depend on care from others. Thus, CC has been the subject of multiple studies. Due to the significant effects of low comprehension, Uong et al. (2021) sought to improve CC of discharge instructions through a quality improvement design. The study determined standard (verbal and written) discharge instructions were associated with improved CC after discharge from a general pediatric inpatient unit at an urban children's hospital. Special cause variation in statistical process control charts compared comprehension of discharge teaching in pre- and post-intervention groups. Strong survey participation allowed for recommendation of standard instruction to improve CC of discharge education. Wilkin (2020) aimed to evaluate the effects of video instructions on CC through surveying a convenience sample of 60 adult patients with diagnoses of upper respiratory tract infection, pharyngitis, or gastroenteritis in a military ED. VDIs were compared to standard discharge instruction methods through a five-question, multiple choice questionnaire in a prospective, randomized control trial.

The survey tool, graded and measurable, allowed for recommendation that VDIs, used in addition to standard verbal and written discharge methods, improved patient understanding and retention of information (Wilkin, 2020).

CC tends to be overestimated by health care providers due to communication quality of the provider and caregiver literacy levels. For this reason, Wood et al. (2017) aimed to evaluate the effect of VDIs in addition to standard instructions alone. A quantitative cross-sectional design evaluated the addition of video instructions compared to standard methods. A sample of 83 caregivers in the ED for any diagnosis found knowledge levels in the video group were significantly higher than standard instructions for all diagnoses through examination of pre- and post-intervention surveys. Performed during months when case volumes were lower, the study had a limited sample size but good adaptability. It is recommended other hospitals incorporate VDIs as a standard practice, demonstrating the need for a larger database of videos for patient education as well as options for non-English-speaking patients. To determine if CC of discharge instructions in the ED can be improved through VDI in addition to standard instructions, Wray et al. (2021) surveyed 240 adult and pediatric patient caregivers in an academic, tertiary care ED. They found VDIs improved CC compared to standard discharge instructions for the closed head injury, upper respiratory infection, and vaginal bleeding in early pregnancy groups, but similar CC in splint care populations. Strengthened through adaptability to other settings, VDIs are recommended in addition to written instructions to improve CC and patient outcomes (Wray et al., 2021). Multiple studies concluded the use of written and verbal instructions improve CC, however, written, verbal, and VDI instructions provide more effective CC as well as clear, consistent, and

high-quality instruction regardless of caregiver literacy level or individual provider communication skill.

Retention of discharge information proved to be an important concept in VDI research due to its effect on caregiver ability to provide home management of pediatric patient health conditions. Bloch & Bloch (2013) aimed to determine if the addition of VDIs affect CC of their child's ED visit, plan, and follow-up instructions immediately before discharge and 2-5 days after discharge. In an academic pediatric ED, 436 caregivers of children aged 29 days to 18 years with a diagnosis of fever, vomiting, diarrhea, wheezing, or asthma were included in a randomized control trial. The VDI intervention group found videos to be extremely helpful and scored significantly higher on the CC questionnaire both before discharge and after discharge compared to standard methods (Bloch & Bloch, 2013). Ismail et al. (2016) investigated if VDIs, added to standard methods of instruction, improve CC of their child's diagnosis, disease process, and discharge instructions. Through a randomized control trial, 63 caregivers of pediatric patients in an urban academic pediatric ED with a fever or closed head injury completed a post-test evaluating CC and a phone call two weeks later assessing follow-up care needs. Again, VDI groups scored significantly higher on post-intervention tests and demonstrated strong information retention rates and suggested VDI in addition to standard instructions improved CC (Ismail et al., 2016).

A variety of symptoms are expected after certain outpatient procedures or hospital discharges. For example, pain is a common and expected side effect of surgery, however, many parents make unnecessary visits to the ED or doctor's office without this understanding. Many studies found VDIs as a useful tool regarding perception of

symptoms and symptom severity among caregivers. Belisle et al. (2019) examined the effectiveness of VDIs in the ED among parents of children with acute otitis media (AOM) through the use of AOM Severity of Symptoms (AOM-SOS) survey administered 72 hours post-hospital discharge. Through a randomized trial, 219 parents of children aged six months to 17 years with a chief complaint of otalgia in a Children's Hospital ED in London watched a five-minute video detailing the identification and management of pain and fever related to otalgia. Parents in the VDI group reported 55% fewer perceived AOM symptoms compared to the non-intervention, standard group (Belisle et al., 2019). To improve caregiver uncertainty in AOM discharge education, Bond et al. (2020) evaluated the effectiveness of VDIs for 219 parents of children presenting to a Canadian pediatric ED with AOM. A randomized study utilized outcome measures of AOM-SOS scores, parental knowledge gain, functional outcomes, and the number of children who received antibiotics or analgesics following discharge. Although the AOM-SOS scores were lower in the intervention group, no differences in knowledge gain, functional outcomes, and the number of children receiving antibiotics or analgesics following discharge were noted (Bond et al., 2020).

High CC of discharge instructions not only improves symptom severity and perception of symptoms but decreases unnecessary return visits as well. Jové-Blanco et al. (2021) conducted a randomized trial in a pediatric ED in a third-level Spanish hospital. The study aimed to evaluate if the addition of VDIs to verbal information improved CC in 139 caregivers for children ages one month to 16 years being evaluated for gastroenteritis. Outcome measures included caregiver test scores evaluating comprehension of discharge information obtained before and after discharge from the

ED, frequency of return visits, and caregiver satisfaction levels. A strength of this study was a large Spanish-speaking population supporting adaptability to other patient populations. Results from questionnaires demonstrated improved CC among VDI groups as well as fewer return visits compared to the standard group (Jové-Blanco et al., 2021).

Studies in the search also considered caregiver perception of VDI use. CeCe et al. (2021) evaluated the self-rated CC and satisfaction with video versus face-to-face discharge instructions in first-time mothers caring for neonates. A family medicine delivery service served as the setting for 57 first-time mothers who completed satisfaction and comprehension surveys with VDI compared to verbal, face-to-face methods by a single resident physician. There was an increase in caregiver confidence in the VDI intervention group compared to verbal-only groups. VDI provided similar levels of CC and caregiver satisfaction between the groups. VDIs increase efficiency and consistency when providing patient education (CeCe et al., 2021).

Other studies examined perceived caregiver value of VDI and overall satisfaction with VDIs. Atzema et al. (2013) aimed to determine the effect VDIs have on patient understanding and recall of their discharge instructions compared to standard instructions by evaluating CC, perceived value of VDIs, and overall satisfaction with VDIs. Patients were contacted by telephone after discharge to answer standardized questions about their discharge instructions. This randomized control trial found correct scores were 3.5 times higher in the video group compared to the control group. Patient learning preference is not taken into account with some forms of VDI use. Diagnosis-specific VDIs improve patient understanding and retention of discharge information while maintaining high caregiver satisfaction (Atzema et al., 2013).

From a nursing perspective, Witherspoon et al. (2021) set out to examine if VDI reduces delayed discharge after robotic prostatectomies while maintaining a high level of patient satisfaction. With discharge time as an outcome measure, VDIs were added to standard education methods in order to achieve timely discharges, consistency of information, and high levels of patient satisfaction. Delayed discharges decreased in the VDI intervention group, but the study did not evaluate patient outcomes after discharge. VDI is recommended for patient education and improves consistency of information while maintaining high levels of patient satisfaction (Witherspoon et al., 2021). In a busy outpatient setting, decreasing the time nurses spend in patient rooms allows for better workflow ability.

Well-known concepts from the literature support VDIs in addition to standard methods of verbal and written instructions as very effective for CC, retaining discharge education information and improving patient outcomes. VDIs decreased perceived symptom severity, adverse events post discharge, and unnecessary return visits when compared to use of only verbal and written instructions. Providers and nurses experience improved workflow ability with VDIs. VDIs can be used alone, however, VDIs and standard verbal and written instructions are recommended. Although no studies specifically studied the use of VDI in pediatric urology patients, the research in other populations suggest the addition of VDI in pediatric urology patients could be beneficial.

The Plan-Do-Study-Act model is used to guide the project (Institute for Healthcare Improvement [IHI], 2021). A study question is formed in the planning phase: In pediatric patients having urological outpatient procedures, how effective are standardized discharge instructions with educational videos in providing consistent

discharge information, high levels of CC, and preventing adverse events during a two-week period after hospital discharge? It is anticipated standardized discharge instructions will improve CC, consistency among discharge instructions from nursing and physicians, and decrease adverse events experienced after discharge from the hospital. Two surveys will be used for data collection and quantitative analysis. The “Do” phase of the model will entail a three-month period of implementing the standardized instructions in an outpatient surgery department and surveying caregivers. Data from the surveys will be analyzed during the “Study” phase in order to summarize, compare, and reflect on what was learned from implementation of standardized instructions (IHI, 2021). Implications for practice and improvements to the intervention will be a large part of the study cycle. Lastly, findings from the study will guide future discharge practices in the “Act” cycle.

Methods

Design

This QI project is a descriptive evaluation of change in how discharge instructions are written and provided. Quantitative and qualitative data was collected through the use of surveys administered to caregivers. Quantitative data gathered included the type of procedure, degree of similarity between provider and nurse discharge instructions, caregiver confidence regarding pain control, care of the surgical site, and care of the catheter and stent. Qualitative data collected included the assessment of responses to items asking caregivers about unanswered questions, unexpected issues at home, problems at home causing them to reach back out to the care team, and topics they would have liked the video to cover.

Setting

This project takes place in an outpatient surgery department (OPD) in a Children's Hospital in a metropolitan area in the Midwest. Approximately 3,076 pediatric surgeries are performed at this hospital each year, 345 of which are pediatric urology procedures.

Sample

This project utilized a stratified convenience sample of pediatric urology patients who had outpatient surgery from January to March 2022. Caregivers of patients 0-18 years old who were discharged from the OPD were included. Inpatient urology surgeries, patients older than 18 years, and patients with procedures for specialties other than pediatric urology were excluded from the sample. The sample included 40 caregivers total. Each of the four videos are represented by a variable number of surveys, representative of the procedural frequency in the unit's surgical makeup.

Approval Processes

Formal, written approval was granted by the Executive Director of Women's and Children's Hospital on August 1, 2021. The pediatric urology surgeon approved the project and the information provided in the handouts and VDI. The project was deemed QI and not a matter of human subject's research after review by both the site and University of Missouri- St. Louis Institutional Review Boards.

Data Collection/ Analysis

Data was collected via two surveys, one completed prior to discharge on the day of the procedure and the second completed by a phone call two weeks after the procedure. The first survey included six questions. One item evaluated consistency of

discharge instructions and three evaluated the degree of confidence in providing post procedure care. These four items used a four-point Likert scale. Two additional open-ended questions asked about unanswered questions and other information caregivers would like included in the videos. The discharge nurses wrote the name of the procedure and video watched on Survey #1. Survey #2 included three questions. A yes/no question evaluated if and how many times caregivers had to reach out to the care team after discharge with questions. The next two open-ended questions asked about unexpected issues not covered in VDIs or discharge handouts and feedback regarding improvement of discharge education. Descriptive statistics was used to analyze survey responses. The open-ended questions were collated and evaluated for patterns. Inferential statistics was used to look for differences in results among the four videos.

Procedures

Standardizing discharge instructions by creating consistent handouts with corresponding VDIs replaced current methods of outdated handout information for pediatric urology outpatient surgeries. New discharge handouts and videos were created by the project investigator. The surgeon approved VDI scripts and new handouts before the recording and printing process began. Four videos, 6-10 minutes in length, were made and corresponding handouts followed the video template. Video one explained a hypospadias repair. Video two explained cystoscopy and ureteroscopy. Video three explained circumcision, lysis of adhesions, phimosis, scrotoplasty, and chordee repair. Video four explained hydrocelectomy, orchiopexy, varicocelectomy, and inguinal hernia repair. VDIs were uploaded to a designated tablet for patient viewing. The videos were also uploaded to YouTube and caregivers were given a link to the video on their

discharge handout. If multiple procedures were done with different VDIs, the caregiver watched all videos and received all of the corresponding handouts specific to the procedures completed. During the month prior to the start of the project, staff nurses in the PACU and Post-Op department were educated on the project during weekly staff meetings. Information on the project interventions, process, survey tools, and expectations were provided during multiple department in-services. The project investigator printed a stock supply of discharge handouts and create a “urology discharge desk” in the department with instructions for intervention, handouts, surveys, completed survey bin, tablet charging station, and the project investigator’s contact information.

From January to March 2022, staff nurses in the OPD administered and collected Survey #1 after all discharge teaching was completed for caregivers who agreed to complete surveys. Completed surveys were put in a designated tray at the nurse’s station to be collected weekly by the project investigator. Staff nurses who discharged urology patients with any of the 12 designated procedures mentioned above gave the parents a tablet with the appropriate discharge video ready to play, the paper handout to follow along with the video, and a pen to write down any questions. After the VDI is finished, any remaining questions were answered and the discharge nurse administered Survey #1 to caregivers who chose to participate. Discharge nurses gave a brief explanation of the survey’s purpose, a quality improvement initiative, and caregivers were asked if they would participate in the project through surveys, voluntarily give a phone number, and participate in a three-question phone call two-weeks after the procedure for Survey #2. No patient identifiers were included on the surveys. A master list updated by the discharging staff member included the date of the procedure, the procedure, a caregiver

phone number, preferred time of phone call, and check box for completion of the two-week phone call. The master list was shredded once all of the phone calls were completed. The procedure performed and date of procedure were included on both surveys. Completed surveys and master list were placed in the appropriate bin at the urology discharge desk. Completed Survey #1 forms were collected weekly and stored for use for the Survey #2 phone call. From January to April 2022, the project investigator administered Survey #2 via phone call two-weeks after the procedure date. During the phone call, the project investigator asked Survey #2 questions, wrote down caregiver responses, and attached Survey #2 to Survey #1 for reference.

Results

The frequency of individual procedures by video represented in this project is shown in Table 1.

Table 1*Frequency of Procedures by Video*

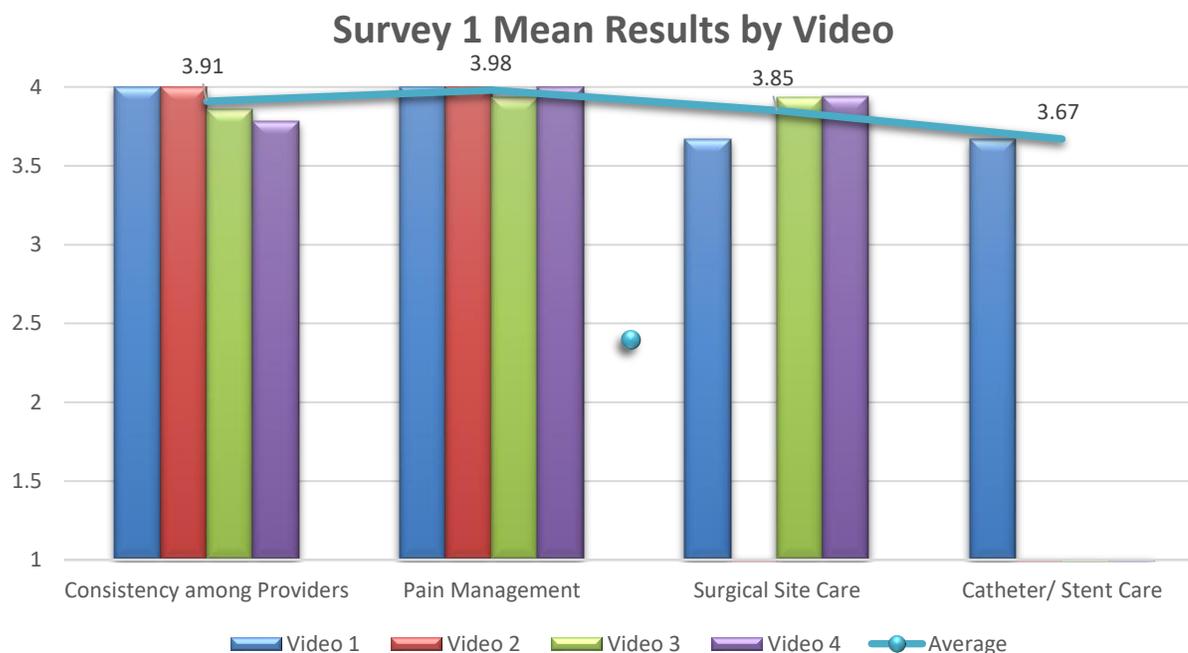
	<i>Frequency of procedure</i>
Video 1	
Hypospadias Repair	4
Video 2	
Cystoscopy	5
Ureteroscopy	5
Video 3	
Circumcision	12
Lysis of Adhesions	6
Phimosis Repair	0
Scrotoplasty	2
Chordee Repair	2
Cyst Removal	2
Video 4	
Hydrocelectomy	19
Orchiopexy	9
Inguinal Hernia Repair	15
Varicocelectomy	0
Diagnostic Laparoscopy	3
Excision of Appendix Testes	15

Forty-one caregivers completed Survey #1 and 39 caregivers completed Survey #2. Table 2 shows the number of participants for each of the four videos. Increases in survey participants seen in Survey 2 compared to Survey 1 is a result of staff nurses forgetting to administer Survey #1, but still writing down contact information on the Master List for Survey #2. Additionally, the survey responses from participants who viewed more than one video were counted towards multiple videos. Approximately 86% of caregivers completed both survey 1 and 2 demonstrating a consistent representation of feedback.

Table 2*Survey Participants by Video*

Video	Survey #1	Survey #2
1	3	4
2	6	6
3	14	13
4	18	16

Mean scores for each question by video and total mean scores for each question are displayed in Figure 1. ANOVA analyses were used to evaluate any differences in responses by question among the four videos. There were no statistically significant differences between the four videos when comparing consistency of discharge information among providers, CC and adverse events after discharge. Analysis of means and standard deviation values demonstrated very little variability in survey responses among the four videos (Table 3). Therefore, analyses for individual procedures were not performed. Not all questions were applicable to each video. For instance, there was no surgical site for the video 2 procedures.

Figure 1*Survey #1 Mean Results by Video***Table 3***Mean and Standard Deviation among Videos by Dependent Variables*

	Mean	Standard Deviation
Video 1		
Consistency among Providers	4.00	0.00
Pain Management	4.00	0.00
Surgical Site Care	3.67	0.58
Video 2		
Consistency among Providers	4.00	0.00
Pain Management	4.00	0.00
Video 3		
Consistency among Providers	3.86	0.36
Pain Management	3.93	0.27
Surgical Site Care	3.93	0.27
Video 4		
Consistency among Providers	3.78	0.43
Pain Management	4.00	0.00
Surgical Site Care	3.94	0.25

Responses to Survey #2 questions on unexpected issues, call to the care team and unanswered questions had very few “yes” responses. There was one caregiver who reported an unexpected issue and three that called the care team. All videos were reported by caregivers to be highly effective in providing consistent instructions among providers, have high levels of CC, and low levels of adverse events after discharge.

Discussion

In pediatric patients having urological outpatient procedures, standardized discharge instructions with VDIs are highly effective in providing consistent discharge information, high levels of CC, and preventing adverse events during a two-week period after hospital discharge. The two surveys differed slightly in video representation due to some caregivers not answering the phone call for Survey #2 and nursing staff forgetting to administer Survey #1 but still writing down caregiver contact information on the master list. The lowest mean scores were for Video 1 in caregiver confidence caring for the surgical site and catheter. Video 1 gives instructions for a more medically complicated procedure, a hypospadias repair. Therefore, it is understandable caregivers may feel less confident caring for a more complicated surgical site and catheter. The results do not suggest the need for changes because the mean score was 3.67. Notably, caregivers rated similarity of discharge instructions among providers at 98%. Given that 100% of discharge material was different among providers before the project, this result demonstrates highly effective interventions.

Four caregivers reported calling the care team and having unexpected issues in Survey #2. Of those caregivers, all watched either Video 1 or Video 4 which included more invasive procedures with larger surgical sites and need for catheter care at home.

Reasons for reaching back out to the care team included skin glue opening up on the incision, a suture that continued to bleed for a prolonged period of time, and a suture that came undone causing the catheter to move. The previously mentioned events were discussed in the VDIs and handouts as reasons for caregivers to reach back out to the care team demonstrating high levels of CC. The only unexpected issue reported was purulent drainage from the surgical site. Purulent drainage was listed in the VDIs and handouts as reasons for caregivers to reach back out to the care team, however, this particular caregiver said the issue resolved, so they did not call the care team.

Strengths of the project include the number of survey responses and adaptability to other healthcare settings and populations. This study was limited to English-speaking patients and the standardization of discharge practices was limited to one pediatric specialty. Strategies for maintaining and sustaining change in discharge practices entail making handouts accessible through the EMR, loading VDIs to all of the department iPads, and creating VDIs and new handouts for other specialties in the pediatric OPD. Expansion of VDI use to other areas may help improve the quality of discharge education, especially those with high nursing turnover, travel nurses, float nurses, and PRN staff who do not have the expertise most full-time staff hold. Financial restraints in healthcare institutions limit the ability of nursing units to use professional videography companies to create educational videos. However, healthcare professionals can learn the skills needed to make low-cost videos with PowerPoint, animation software, and YouTube tutorials like the ones utilized in this project. Implications for practice include the expansion of technological education among nurses and providers so they can create quality improvement initiatives in their setting despite a lack of funding resources.

Further study is needed to evaluate the effectiveness of VDIs in other pediatric settings such as pediatric inpatient units, pediatric ICUs, and pediatric specialty care areas.

Conclusion

VDIs along with written and verbal instructions improve comprehension and retention of information, caregiver satisfaction, symptom severity, and patient outcomes (Atzema et al., 2013; Jové-Blanco et al., 2021; Wray et al., 2021). Utilizing descriptive statistics for caregiver surveys, VDI use was shown to be highly effective in providing consistent instructions among providers, high levels of CC, and low levels of adverse events after discharge. Further study is needed to evaluate the effectiveness of VDIs in other pediatric settings. Due to the high cost of professional video creation, existing resources like YouTube and PowerPoint can be used by healthcare professionals to create quality patient education with relatively low cost. VDIs in addition to verbal and written instructions are very effective for CC, retaining discharge education information and improving patient outcomes for pediatric urology patients in an OPD.

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of video education in postoperative patient counselling: A quality improvement initiative. *Canadian Urological Association*. <http://dx.doi.org/10.5489/cuaj.7240>

- Wood, E. B., Harrison, G., Trickey, A., Friesen, M. A., Stinson, S., Rovelli, E., McReynolds, Presgrave, K. (2017). Evidence-based practice: Video-discharge instructions in the pediatric emergency department. *Journal of Emergency Nursing*, 43(4), pp.316-321. <http://dx.doi.org/10.1016/j.jen.2016.11.003>
- Wray, A., Goubert, R., Gadepally, R., Boysen-Osborn, M., Wiechmann, W., & Toohey, S. (2021). Utilization of educational videos to improve communication and discharge instructions. *Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health*, 22(3), pp.644-647.
10.5811/westjem.202

Appendix A

Evidence Matrix

CITATION	PURPOSE / BACKGROUND	PARTICIPANTS / SETTING	METHODS / DESIGN	RESULTS / LIMITATIONS / RECOMMENDATIONS
<p>Atzema, C. L., Austin, P. C., Wu, L., Brzozowski, M., Feldman, M. J., McDonnell, M., & Mazurik, L. (2013). Speak fast, use jargon, and don't repeat yourself: A randomized trial assessing the effectiveness of online videos to supplement emergency department discharge instructions. <i>PLoS ONE</i>, 8(11), pp. e77057. 10.1371/journal.pone.0077057</p>	<p>Purpose: To evaluate the effect of viewing an online video of diagnosis-specific discharge instructions on patient comprehension and recall of information</p> <p>Outcome Measures:</p> <ul style="list-style-type: none"> - patient's score (out of 3) on questions about their discharge instructions - patient rating (on a 10-point scale) of the value of the videos and comprehension of discharge instruction - patient satisfaction with the videos, on a 10-point scale <p>Aims: to determine the effect online videos have on patient understanding and recall of their discharge instructions</p>	<p>Sample: Patients of any age discharged from the emergency department if they had one of 38 final emergency department diagnoses</p> <p>Setting: the emergency department of Sunnybrook Health Sciences Centre, a tertiary adult hospital in Toronto</p>	<p>Design: randomized control trial</p> <p>Interventions:</p> <ul style="list-style-type: none"> - An online video of diagnosis-specific discharge instructions - After discharge, patients were contacted by telephone and asked three standardized questions about their discharge instructions; a point was awarded for each correct answer 	<p>Results:</p> <ul style="list-style-type: none"> - Patients in the video group had 19% higher mean scores than patients in the control group - Correct scores were 3.5 times higher in the video group, compared to the control group <p>Strengths:</p> <ul style="list-style-type: none"> - almost all patients had access to the internet <p>Limitations: study was conducted at a single site, serving a lower proportion of patients with a low socioeconomic status</p> <ul style="list-style-type: none"> -not all patients learned well through video methods, other patients preferred written and verbal format <p>Recommendations:</p> <ul style="list-style-type: none"> - Videos are a helpful addition to standard discharge instructions - Online videos of diagnosis-specific discharge instructions improve patient understanding and retention of discharge information
<p>Belisle, S., Dobrin, A., Elsie, S., Ali, S., Brahmabhatt, S., Kumar, K., Jasani, H., Miller, M., Ferlisi, F., & Poonai,</p>	<p>Purpose: to improve the education for discharge care from a health care setting to home</p> <p>Outcome Measures:</p> <ul style="list-style-type: none"> - Acute Otitis Media (AOM) Severity of Symptom (AOM- 	<p>Sample: parents of children age six months to 17 years with a chief complaint of otalgia</p> <p>Setting:</p>	<p>Design: open-label, parallel group, randomized, two-arm superiority trial</p> <p>Interventions:</p>	<p>Results: The median AOM-SOS score for the video was significantly lower (fewer perceived symptoms) than the paper handout method</p>

CITATION	PURPOSE / BACKGROUND	PARTICIPANTS / SETTING	METHODS / DESIGN	RESULTS / LIMITATIONS / RECOMMENDATIONS
<p>N. (2019). Video discharge instructions for acute otitis media in children: A randomized controlled open-label trial. <i>Society for Academic Emergency Medicine</i>, 26(12), pp.1327-1335. 10.1111/acem.13839</p>	<p>SOS) score from parents 72 hours post-hospital discharge - Caregiver knowledge (10-item survey) - Absenteeism, recidivism, and satisfaction (five-item Likert scale) Aim: to examine the effectiveness of video discharge instructions in the emergency department among parents of children with AOM</p>	<p>- Emergency Department of the Children's Hospital, London - Health Sciences Center in London, Ontario, Canada - March 2017 to June 2018</p>	<p>- Patients being discharged from the emergency department watch a five-minute video detailing the identification and management of pain and fever related to otalgia - Results from video viewers are compared to non-video, paper handout only education - knowledge questionnaire (AOM-SOS), paper, and video instructions</p>	<p>Strengths: Study also used written and verbal explanation as a comparison measure Limitations: sampling included a larger population of middle-income-class parents with higher education which affects the ability to generalize results to other populations Recommendations: Video discharge instructions in the emergency department are associated with fewer perceived AOM symptoms compared to paper handouts</p>
<p>Bloch, S. A. & Bloch, A. J. (2013). Using Video Discharge Instructions as an Adjunct to Standard Written Instructions Improved Caregivers' Understanding of Their Child's Emergency Department Visit, Plan, and Follow-Up. <i>Pediatric Emergency Care</i>, 29(6), pp. 699-704. 10.1097/PEC.0b013</p>	<p>Purpose: to improve caregiver understanding of discharge instructions Outcome Measures: comprehension of instructions Aim: to determine if the addition of video discharge instructions effect caregivers understanding of their child's emergency department visit, plan, and follow-up</p>	<p>Sample: 436 caregivers of children ages 29 days to 18 years with a diagnosis of fever, vomiting, diarrhea, wheezing, or asthma Setting: academic pediatric emergency department</p>	<p>Design: A randomized control trial Interventions: - video discharge instructions - 20-point questionnaire given after instructions were administered - Caregivers contacted again by phone 2-5 days after discharge for a follow-up phone call</p>	<p>Results: group receiving video discharge instructions scored significantly higher in the ED and 2 to 5 days after discharge. – 29% of the written and 42% of the video group rated their discharge instructions as being extremely helpful during the follow-up phone call Strengths: multiple common diagnoses included allowed a large sample size Limitations: conducted at one academic pediatric emergency department - only included English-speaking caregivers Recommendations: Brief video discharge instructions improved caregiver knowledge and satisfaction in</p>

CITATION	PURPOSE / BACKGROUND	PARTICIPANTS / SETTING	METHODS / DESIGN	RESULTS / LIMITATIONS / RECOMMENDATIONS
e3182955480. PMID: 23714763				the emergency department and 2-5 days post-discharge compared with written discharge instructions alone - Video instructions are a good addition to standard methods
Bond, C., Morgenstern, J., Heitz, C., & Milne, W. K. (2020). Hot off the press: Video for acute otitis media discharge instructions. <i>Society of Academic Emergency Medicine</i> , 27(8), pp. 775-778. 10.1111/acem.13923	Purpose: to improve caregiver uncertainty of AOM discharge education. Outcome Measures: AOM-SOS score (symptoms); parental knowledge gain, functional outcomes, and the number of children receiving antibiotics or analgesics following discharge Aim: to evaluate the effectiveness of video discharge instructions for AOM.	Sample: 219 parents of children presenting to the emergency department with AOM Setting: single Canadian tertiary care pediatric emergency department	Design: Randomized study Interventions: five-minute video detailing AOM discharge instructions	Results: Symptom severity scores were lower in intervention group compared to non-intervention group - no differences in secondary outcomes: knowledge gain, functional outcomes, and the number of children receiving antibiotics or analgesics following discharge Strengths: no crossovers in the trial Limitations: convenience sample of patients, performed in a larger hospital with a lot of resources, 68% completion of primary outcomes measure. Recommendations: video discharge instructions may improve symptom severity 72 hours after emergency department discharge for AOM
CeCe, K. L., Chargot, J. E., Hashikawa, M., Plegue, M., A., & Gold, K. J. (2021). Use of tablet video for delivery of neonatal discharge instruction to first-time parents. <i>Family Medicine</i> , 53(2), pp.145-147.	Purpose: to evaluate patient perceptions of video tools for discharge instructions Outcome Measures: self-rated comprehension and overall satisfaction scores Aim: to assess self-rated comprehension and overall satisfaction with video versus face-to-face neonatal discharge instructions in first-time mothers	Sample: 57 medically-stable postpartum primiparous - English-speaking women 17 years and older Setting: low-risk family medicine delivery service	Design: randomized controlled, nonblinded trial Interventions: Intervention mothers viewed a prerecorded video that includes both auditory and visual instructions on a tablet at bedside - Control group received verbal face-to-face	Results: The intervention group reported a greater increase in confidence, though not significant (P=0.41) - no differences between the groups in understanding the discharge instructions - use of video discharge instructions is comparable to face-to-face instructions given by a resident physician in maternal satisfaction and self-rated comprehension

CITATION	PURPOSE / BACKGROUND	PARTICIPANTS / SETTING	METHODS / DESIGN	RESULTS / LIMITATIONS / RECOMMENDATIONS
10.22454/FamMed.2 021.551065			instructions by a resident physician	<p>Strengths: the control and intervention groups has similar demographics like maternal age, education, race, and insurance type</p> <p>Limitations: small sample size, the number of surveys not returned, and a lack of pre- versus postintervention data</p> <p>Recommendations: Videos could benefit residents and faculty in terms of increasing efficiency and providing consistent patient education</p>
Ismail, S., McIntosh, M., Kalynych, C., Joseph, M., Wylie, T., Butterfield, R., Smotherman, C., Kraemer, D. F., & Osian, S. R. (2016). Impact of video discharge instructions for pediatric fever and closed head injury from the emergency department. <i>Journal of Emergency Medicine</i> , 50(3), pp. e177-83. 10.1016/j.jemermed.2015.10.006	<p>Purpose: to improve caregiver understanding of their child's discharge instructions</p> <p>Outcome Measures: post-intervention test scores</p> <p>Aim: to determine if video discharge instructions added to standard of care, written and verbal instruction, improve caregiver comprehension of their child's diagnosis, disease process, and discharge instructions</p>	<p>Sample: 63 caregivers who presented to the Pediatric emergency department with a chief complaint of fever or closed head injury (CHI)</p> <p>Setting: an urban academic Pediatric emergency department</p>	<p>Design: randomized control trial</p> <p>Interventions: each group received standard discharge instructions, and the intervention group also viewed a video</p> <p>- Participants completed a post-test over knowledge and were followed 2 weeks post-visit to determine follow-up care</p>	<p>Results: intervention group scored significantly higher on postintervention tests than the control group</p> <p>Strengths: participant demographics allowed generalizability to other populations</p> <p>Limitations: small time period for data collection</p> <p>- small sample size</p> <p>Recommendations: video discharge instructions, in addition to verbal and written instructions, improve caregiver comprehension of the child's diagnosis and disease process</p>
Jové-Blanco, A., Solís-García, G., Torres-Soblechero,	<p>Purpose: To determine if video discharge instructions (VDIs) are</p>	<p>Sample: 139 patients from one month to 16 years being</p>	<p>Design: open-label, parallel, randomized trial</p>	<p>Results: Video instructions improve caregiver understanding of discharge information.</p>

CITATION	PURPOSE / BACKGROUND	PARTICIPANTS / SETTING	METHODS / DESIGN	RESULTS / LIMITATIONS / RECOMMENDATIONS
<p>L., Escobar-Castellanos, M., Mora-Capín, A., Rivas-García, A., Castro-Rodríguez, & Marañón, R. (2021). Video discharge instructions for pediatric gastroenteritis in an emergency department: A randomized, control trial. <i>European Journal of Pediatrics</i>, 180, pp.569-575. https://doi.org/10.1007/s00431-020-03827-w</p>	<p>effective methods for patient education. Outcome Measures: difference in scores obtained in step one and step three, return visit frequency, and caregiver satisfaction Aim: to evaluate if the addition of VDIs to verbal information improve caregiver comprehension of information in patients consulting for acute gastroenteritis</p>	<p>evaluated for acute gastroenteritis Setting: Pediatric emergency department in a third-level Spanish hospital</p>	<p>Interventions: an initial written test, an information phase, and a second follow-up test after discharge</p>	<p>Strengths: A high number of participants completed the follow up test Limitations: single-center design; COVID-19 limited the number of participants. Recommendations: Short videos educating parents on acute gastroenteritis improves caregiver understanding of the information given. - Parent satisfaction is high and return visits are not as frequent</p>
<p>Uong, A., Philips, K., Hametz, P., Dunbar, J., Jain, P.,</p>	<p>Purpose: to improve caregiver comprehension of discharge instructions</p>	<p>Sample: 171 surveys for pre-intervention period and</p>	<p>Design: Quality improvement; statistical process control chart</p>	<p>Results:</p>

CITATION	PURPOSE / BACKGROUND	PARTICIPANTS / SETTING	METHODS / DESIGN	RESULTS / LIMITATIONS / RECOMMENDATIONS
<p>O'Connor, K., Offenbacher, R., Eliezer, K., Pilnick, C., Kiely, V., & Rinke, M. L. (2021). Safer care: Improving caregiver comprehension of discharge instructions. <i>Pediatrics</i>, 147(4), e20200031. https://doi.org/10.1542/peds.2020-0031</p> <p>Wilkin, Z. L. (2020). Effects of video discharge instructions on patient understanding. <i>Advanced Emergency Nursing Journal</i>, 42(1), pp. 71-78. 10.1097/TME.000000000000279</p>	<p>Outcome Measures: the proportion of caregivers correctly responding to all questions related to discharge care, - Comparing pre- and post-intervention periods</p> <p>Aim: to determine if a standardized framework for written and verbal discharge instruction is associated with improved caregiver comprehension of discharge instructions after discharge from a general pediatric inpatient unit</p>	<p>262 surveys in the post-intervention period</p> <p>Setting: a general pediatric inpatient unit at an academic, tertiary care children's hospital in an urban setting</p>	<p>with special cause variation</p> <p>Interventions: Caregivers were surveyed by phone within four days of discharge</p>	<p>- interventions were associated with improved caregiver comprehension of discharge instructions</p> <p>Strengths: survey participation was similar before and after intervention</p> <p>Limitations: generalizability due to specific population size</p> <p>Recommendations:</p> <p>- SAFER Care framework in written and verbal discharge instructions can improve caregiver comprehension</p>
<p>Wilkin, Z. L. (2020). Effects of video discharge instructions on patient understanding. <i>Advanced Emergency Nursing</i></p>	<p>Purpose: to improve patient's understanding of discharge instructions</p> <p>Outcome Measures:</p> <p>- patient understanding of discharge instructions utilizing a five-question survey</p>	<p>Sample: convenience sample of 60 adult patients with diagnoses of upper respiratory tract infection, pharyngitis, or gastroenteritis.</p>	<p>Design: prospective, randomized control trial</p> <p>Interventions: patients received one of two different discharge education methods (video or verbal/written)</p>	<p>Results: Video discharge instructions, used in addition to standard verbal and written discharge methods, improved patient understanding and retention of information</p> <p>Strengths: Survey tool was graded and measurable</p>

CITATION	PURPOSE / BACKGROUND	PARTICIPANTS / SETTING	METHODS / DESIGN	RESULTS / LIMITATIONS / RECOMMENDATIONS
<p><i>Journal</i>, 42(1), pp. 71-78. 10.1097/TME.000000000000279</p>	<p>Aim: to evaluate the effects of video instructions on patient understanding of their discharge instructions</p>	<p>Setting: military hospital emergency department</p>	<p>and completing a five-question, multiple-choice questionnaire</p>	<p>Limitations: study was completed at one facility limiting generalizability</p> <p>Recommendations: Video discharge instructions used with written and verbal instructions help caregivers understanding and retention of discharge information</p>
<p>Witherspoon, L. D. E., Gan, A. M. L., Breau, R. H., Saumure, G., Shea, J., Mallick, R., Warren, J. E., Blew, B., Cagiannos, I., Morash, C., & Lavallée, L. T. (2021). Use of video education in postoperative patient counselling: A quality improvement initiative. <i>Canadian Urological Association</i>. http://dx.doi.org/10.5489/cuaj.7240</p>	<p>Purpose: to improve postoperative patient education</p> <p>Outcome Measures: discharge time</p> <p>Aim: to examine if a video-based resource could reduce delayed discharges after robotic prostatectomy while maintaining high levels of patient satisfaction</p>	<p>Sample: 425 adult patients who underwent robotic assisted radical prostatectomy</p> <p>Setting: Ottawa Hospital in Canada</p>	<p>Design: quantitative study</p> <p>Interventions: six educational videos are to be added to routine discharge education - Likert Scale surveys were given to evaluate the usefulness, quality, and satisfaction of intervention before discharge</p>	<p>Results: Delayed discharges decreased after the intervention and improved patient satisfaction compared to non-video education</p> <p>Strengths: video education tools were saved in EMR for easy access</p> <p>Limitations: did not evaluate patient outcomes post-discharge</p> <p>Recommendations: video education tools are recommended for patient education and help with consistency of information, while maintaining high levels of patient satisfaction.</p>
<p>Wood, E. B., Harrison, G., Trickey, A., Friesen, M. A., Stinson, S., Rovelli, E., McReynolds,</p>	<p>Purpose: to improve caregiver knowledge about their child's diagnosis, treatment, illness duration, and when to seek further medical care after a hospital visit</p>	<p>Sample: 83 caregivers of pediatric patients 21 years old and younger visiting the emergency department</p>	<p>Design: quantitative cross sectional</p> <p>Interventions: five-question surveys given to caregivers pre and</p>	<p>Results: Knowledge level was significantly higher for caregivers in the video group compared to standard instructions for all diagnoses combined</p>

CITATION	PURPOSE / BACKGROUND	PARTICIPANTS / SETTING	METHODS / DESIGN	RESULTS / LIMITATIONS / RECOMMENDATIONS
<p>Presgrave, K. (2017). Evidence-based practice: Video-discharge instructions in the pediatric emergency department. <i>Journal of Emergency Nursing</i>, 43(4), pp.316-321. http://dx.doi.org/10.1016/j.jen.2016.11.003</p>	<p>Outcome Measures: post-test surveys given to caregivers</p> <p>Aim: To evaluate the effect of video discharge instructions in addition to verbal and written instructions to only verbal and written instructions</p>	<p>Setting: Inova Loudoun Pediatric emergency department</p>	<p>post- intervention in both the video instruction intervention and non-video intervention groups</p>	<p>Strengths: iPads donated to hospital, good response rate from participants, adaptability to other units</p> <p>Limitations:</p> <ul style="list-style-type: none"> -All participants were English-speaking -Performed in summer when case volumes in the emergency department were lower. <p>Recommendations:</p> <ul style="list-style-type: none"> - to have a large national or hospital-system database of videos available would make utilizing video-discharge instructions easier - Encourage other hospitals to adopt this method of education and make it the new standard of practice
<p>Wray, A., Goubert, R., Gadepally, R., Boysen-Osborn, M., Wiechmann, W., & Toohey, S. (2021). Utilization of educational videos to improve communication and discharge instructions. <i>Western Journal of Emergency Medicine: Integrating Emergency Care with Population</i></p>	<p>Purpose: to make sure patients have a good understanding of their discharge instructions</p> <p>Outcome Measures: Patient understanding of management of the diagnoses, aftercare, and return precautions</p> <p>Aim: to determine whether patient understanding of discharge instructions in the emergency department can improve through instructional videos in addition to standard written discharge instructions</p>	<p>Sample: 240 adult and pediatric patient caregivers total</p> <p>Setting: single-center, academic tertiary care emergency department</p>	<p>Design: prospective pre- and post-intervention quantitative study</p> <p>Interventions: video discharge instructions</p>	<p>Results:</p> <ul style="list-style-type: none"> - Survey scores after video discharge instructions were better compared to standard discharge instructions for the closed head injury, upper respiratory infection, and vaginal bleeding in early pregnancy groups - No differences in survey scores between the splint care and suture care groups <p>Strengths: adaptability to other settings</p> <p>Limitations: convenience sampling, single-center study</p>

CITATION	PURPOSE / BACKGROUND	PARTICIPANTS / SETTING	METHODS / DESIGN	RESULTS / LIMITATIONS / RECOMMENDATIONS
<i>Health</i> , 22(3), pp.644-647. 10.5811/westjem.20 21.1.48968				Recommendation: Video discharge instructions supplementing standard written instructions can help improve patient comprehension and information retention leading to better outcomes

Appendix B

Survey #1

Discharge Nurse Portion

Procedure: _____ Video # _____

Date of Procedure: _____

Caregiver Portion

1. How similar were the discharge instructions you received from the nurse and the physician?

Completely Different	Mostly Different	Mostly the Same	Completely the Same
1	2	3	4

2. How confident do you feel caring for your child's pain at home?

Not Confident	Somewhat Confident	Somewhat Confident	Confident
1	2	3	4

3. How confident do you feel caring for the surgical site? If this does not apply to you, please write "N/A" and skip this question: _____

Not Confident	Somewhat Confident	Somewhat Confident	Confident
1	2	3	4

4. How confident do you feel caring for your child's catheter or stent? If this does not apply to you, please write "N/A" and skip this question: _____

Not Confident

Somewhat
Confident

Somewhat
Confident

Confident

1

2

3

4

5. Did you have any unanswered questions after receiving discharge instructions from the nurse and watching the video?

YES: *If so, what were they?* _____

NO

6. Is there anything else you wish was covered in the video?

Thank you for helping us improve patient care!

Appendix C

Survey #1

Date of procedure: _____

Procedure: _____

1. Did you have to call the clinic or reach back out to your care team after discharge from the hospital?

YES: *If so, how many times?* _____

NO

2. Did any unexpected issues arise that were not covered in discharge instructions or video?

YES: *If so, what issues?* _____

NO

3. Do you have any suggestions or feedback regarding improvement of discharge education?

Appendix D

Master List

Date of Procedure	Procedure	Caregiver phone number	Best time to call	Survey #2 completed
			Morning- Afternoon- Evening	

			Morning- Afternoon- Evening	
			Morning- Afternoon- Evening	
			Morning- Afternoon- Evening	
			Morning- Afternoon- Evening	