



RETROSPECTIVE DESCRIPTIVE STUDY OF PATIENTS WITH PULMONARY ARTERIAL CATHETERS ON MOBILITY AND AMBULATION

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ABSTRACT

This retrospective study aims to accomplish the following objectives: 1) describe the amount of mobility activity and the type of mobility activity that has been documented for patients who have an indwelling Pulmonary Artery Catheter (PAC); and 2) document the frequency of complications that occur with an indwelling PAC while a patient is participating in these activities. Collecting the required information is the first step toward achieving both of these objectives. Methods: All patients over the age of 18 who were admitted to the Cardiology Intensive Care Unit Between June 2010 and October 2012, 110 patients with in-dwelling PACs were included retrospective, descriptive study that was conducted at a single centre (CICU). The information concerning any and all documented mobility activities that each of these patients engaged in while receiving nursing care or while receiving skilled treatments from a physical therapist (PT) or occupational therapist was compiled and analysed. These patients were receiving either nursing care or skilled treatments from a physical therapist (PT) or occupational therapist (OT). The PAC was operational for a period of time, and during that time, any complications that were brought up in relation to it were documented. The findings revealed that over the course of 29 months, 366 patients in the CICU who were fitted with indwelling PACs took part in activities such as bed mobility, transfers, ambulation, and climbing stairs. Participating in these mobility activities may lead to the following, there were no PAC-related reports of patients experiencing any complications. According to the findings, it does not appear that patients who already have an implanted PAC are at a greater risk of experiencing complications as a result of participating in activities that require mobility. This is the conclusion drawn from the findings of a study that was conducted in the United Kingdom. The idea that the CICU ought to have rehabilitation specialists on staff receives even more support from the aforementioned data. Future research will be required in order to evaluate the efficacy of physical therapy treatment for patients who have indwelling PAC. This evaluation will be possible only after further research has been completed.

Keywords: Patients who have had catheters placed in their pulmonary arteries are allowed to go for walks.

INTRODUCTION

The intensive care unit (ICU) is the first place that it was reported that the Pulmonary Artery Catheter (PAC), which is an indwelling catheter for continuous hemodynamic monitoring, had been used. This took place in the 1970s.

1. "Allows measurement of hemodynamic variables that cannot be measured reliably or continuously by less invasive means," according to the PAC's description of its function. Blood pressure, heart rate, and oxygenation levels in the blood are all examples of these variables.

2. The insertion of the PAC is performed through the right intra-jugular vein the vast majority of the time; however, it can also be done through the left subclavian vein or the femoral vein. The femoral vein is the less common route. Once it has been placed, it will remain in the patient's pulmonary artery so that continuous monitoring of the patient's hemodynamics can be performed. 3 The management of shock, the measurement of intravascular volume, the evaluation of the patient's reaction to therapeutic intervention, and the monitoring of hemodynamic parameters for the purpose of determining

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whether or not the patient is eligible to receive a heart transplant are all indications for the use of a pulmonary artery catheter. 2,4

Patients who are admitted to the ICU and who have PACs are under close observation the entire time they are there. It is standard practise to conduct a daily review of the medical necessity of continuing to use a PAC because of the possibility that complications will develop, and it is standard practise to remove the PAC as soon as it is deemed to be medically appropriate to do so. This is done because of the possibility that complications will develop. 2 In some cases, the insertion of a PAC can result in complications such as ventricular arrhythmias, a blockage of the right bundle branch (which, when combined with a blockage of the left bundle branch that was already present, will result in a complete blockage of the heart), pneumothorax, or knotting of the catheter. Other possible complications include a complete blockage of the heart. There is a possibility of developing complications like pulmonary artery infarction, pulmonary artery rupture, and line infection when a PAC is utilised for an extended period of time. These complications can arise from the use of the PAC. When the PAC is allowed to remain in contact with the pulmonary artery for an extended period of time, the risk of developing a pulmonary artery infarction is increased. 5 Finally, it has been suggested that some of the potential complications that can arise from changing one's position while having an indwelling PAC include a fractured catheter, movement within the pulmonary artery that results in injury to the vessel or accidental dislodgement into the right ventricle, dysrhythmias, and an infarction or rupture of the pulmonary artery. All of these complications have the potential to occur if the patient changes their position while having an indwelling PAC. When one changes their body position, they open themselves up to the possibility of all of these complications occurring. 6 In contrast, in response to this suggestion, an evidence-based strategy has not been put into place as a course of action.

As early mobilisation and the provision of appropriately timed skilled physical therapy for patients in the ICU are emerging areas of research and practise, it is important to address concerns about the potential complications that can arise from positional changes while an indwelling PAC is present. There is a growing awareness of the many negative effects of prolonged bedrest, including muscle atrophy, pressure ulcers, pneumonia, decreased insulin sensitivity, and decreased aerobic capacity. These are just some of the potential side effects. Bed rest can also put a patient at a greater risk of contracting an infection (for review see Winkelman) 7. Even for patients who are receiving treatment with extracorporeal membrane oxygenation, there is evidence to support the use of physical therapy treatment and early mobility as an intervention that is both safe and effective for patients who are being treated in an intensive care unit

(for review, see Adler et al) 8. 9 Recent studies have shown that the use of When patients receive physical therapy in intensive care units (ICUs), they are more likely to return to functional independence than using standard ICU care alone does¹⁰. In addition, the amount of time patients spend in ICUs and hospitals is reduced when physical therapy is utilised. 11 In neither of the two studies, the participation of patients who had been diagnosed with PACs was limited in any way.

As of now there are no published studies that directly measure the effects of positional changes and body movement on the placement of PACs or their complications. This leaves us without any knowledge of the actual risks associated with PAC complications due to positional changes and body movement. This is due to the fact that there are no reports that have been made public that directly measure these effects. Studies such as these that are related to this one include exercise research studies in which PACs were used to measure subjects' hemodynamic stability and exercise response while the subjects sat, marched in place, transferred to a bedside chair, ambulated, climbed stairs, and completed exercise stress tests. No complications related to the PAC were reported as a result of any of these activities. 12–16 "although no specific report has been published about the safety of sitting or walking ICU patients who have pulmonary artery catheters," an expert opinion regarding the connection between patient activity and PAC dysfunction states "although no specific report has been published about the safety of sitting or walking ICU patients who have pulmonary artery catheters," the literature does appear to support both the feasibility and safety in practise. 6 Finally, concerns have been voiced in a manner that is analogous to this one regarding the potential complications that may be caused by shifts in position as well as activities that require mobility while femoral artery catheters are in place. These concerns relate to the potential for complications to arise. According to the findings of a retrospective case series, patients with femoral arterial catheters who participated in physical therapy sessions and performed mobility activities such as sitting on the edge of the bed, standing, transferring to a chair, and walking did not experience any adverse events while participating in those sessions. These patients' mobility activities included sitting on the edge of the bed, standing, transferring to a chair, and walking on the edge of the bed. 17 The femoral arterial catheter was the only type of catheter that was investigated in this study; the pulmonary arterial catheter was not mentioned in any of the findings.

Following the extraction of data from a quality improvement project that tracked physical therapy for patients with indwelling PAC, it was decided to conduct a retrospective analysis of mobility activity and complications related to these devices. This project tracked patients who had undergone an indwelling PAC. This was done in order to get a head start on beginning the process of

exploring the risk of By changing positions and moving around, PAC complications can occur. This is a retrospective study with the descriptive goals of 1) describing the amount and type of documented mobility activity for patients who have an indwelling PAC and 2) documenting the frequency and type of complications that occur with an indwelling PAC while a patient is participating in these activities. Both of these goals are intended to be accomplished through describing Patients with an indwelling PAC should document the type and amount of mobility activity they engage in. In order to achieve both of these objectives, we will describe the quantity and nature of the documented mobility activity that patients who have an indwelling PAC engage in.

Methods

Particular to the Procedures of the Facility

Prior to the year 2010, the frequency of physical therapy consults that were provided to our CICU patients who had indwelling PACs was subject to a practise that was highly variable. This practise could range anywhere from once per week to once per day. The literature^{18–21} frequently makes reference to the fact that intensive care units have a variety of different practises. It was up to the individual nurse, physician, or therapist to decide whether the patient could transfer out of bed or ambulate. Patients with a permanent assistive device (PAC) are unable to participate in mobility activities because there is no consensus policy or guideline, the decision as to whether or not a patient was able to participate in mobility activity was left up to the individual. The decision as to whether or not a patient was able to Personal views varied greatly because there was no Patients using indwelling pacs should follow a consensus-based policy or guideline on mobility activities. Patients who had Assistance needed for mobility activities based on PACs were mobilised in an inconsistent manner. In general, patients who had PACs in place and were capable of independent mobility were given permission While patients with PACs in place and requiring mobility assistance were not allowed to transfer and move around their rooms.

A plan was developed for the evaluation and treatment of patients with indwelling PACs through physical and occupational therapy during discussions with the clinical leadership and the quality improvement committee of the CICU. Close attention was paid to the occurrence of adverse events as the plan was developed. Prior to June 2010, a policy was developed in order to address the variable access to mobility activities and physical therapy interventions that this patient population experienced. This policy was developed in order to address the variable access to mobility activities and physical therapy interventions. In order to evaluate and treat patients who had indwelling PACs, consultations with physical therapists and occupational therapists would continue to be necessary. For the patient to participate in mobility

activities outside of his/her room, a specific order must be provided by the attending physician. Additionally, a registered nurse was required to be present and monitor the PAC waveform on a portable telemetry monitor at all times. After the implementation of this policy for the purpose of quality improvement, PAC placements occurred between June 2010 and October 2012 based on electronic nursing documentation, and this list was then used to create an audit trail of those patients. The purpose of this policy was to improve the quality of care provided to patients.

Between June 2010 and October 2012, approximately 25 physical therapists attended to the needs of patients housed in the coronary intensive care unit (CICU). At our facility, physical therapists have the option of becoming Intensive care and acute care cardiology specialists who are permanent staff members, or rotating staff members (who move between acute care/ICU, acute rehabilitation, and outpatient practise). Permanent staff members treat patients in acute care and the intensive care unit. Patients in the acute care unit and the intensive care unit are treated by members of the permanent staff. One clinical specialist from each of the cardiovascular teams has completed requirements necessary to earn this certification have been given the title of Cardiovascular and Pulmonary Certified Specialist (CCS) by the American Board of Physical Therapy Specialties. This certification is awarded by the ABPTS is an association of Americans who specialize in physical therapy. As physical therapists working in the intensive care unit, they were in charge of overseeing them and consulting with them (CICU). All of the permanent (7) and rotating (14) PTs were either working toward or had already finished specific competency checklists under the supervision of the clinical specialists.

This investigation was carried out at University Hospital, which is a teaching hospital that is a part of the University of Michigan Health System and is located in a suburban area with 800 beds. For the purpose of this investigation, a single-center, retrospective, descriptive study was carried out there. The Institutional Review Board at the University of Michigan has given their approval for this line of research. All patients who were enrolled in the 10-bed cardiology intensive care unit (CICU) and were at least 18 years old and had received an indwelling PAC between the months of In this study, the study period spanned June 2010 through October 2012. The study was carried out in the United Kingdom.

Data Extraction

Medical record numbers, the dates and times of pac placements as well as the dates and times of PAC removals are included on the list of PAC placements that took place between June 2010 and October 2012. These lists cover the period from June 2010 to October 2012. Medical record numbers were used to access the electronic medical records of each patient to extract and gather the

following information about the patient population to describe it: the amount and types of mobility activities documented, the frequency and types of PAC complications, and the characteristics of PAC complications. Using the patient's medical record number on his or her electronic medical record, we retrieved all this information. Two different custom software programmes, MATLAB (developed by The Mathworks and located in Natick, Massachusetts) and SPSS Statistics, version 22 (developed by IBM Corporation and located in Armonk, New York), were utilised in order to compile a summary of the data that was recorded with REDCap software version 22.

Personalities of the Individual Patients

The notes that were taken by physicians, such as the admitting history and physical, daily progress notes, procedure notes, consult notes, alert notes, and discharge summaries, were reviewed in order to extract the data that was pertinent to the investigation. The following categories of information were extracted from the database: category of diagnosis (cardiac arrest/arrhythmia/syncope, cardiac arrest/sepsis/endocarditis, heart failure, respiratory failure, renal failure, myocardial infarction, sepsis/endocarditis, PAC guided diuresis, or heart failure), age at admission (in years), gender (male or female), and ejection fraction (less than 10 percent, 10–19 percent (alive or deceased).

Mobility Data

In order to collect information regarding mobility, the documentation pertaining to Occupational therapy, physical therapy, and nursing were all examined carefully. Our physical therapists combed through all of the patient's documentation and found the information needed to determine whether each of the following activities had been conducted by the patient. Rolling, getting up from a seated position, standing up from a seated position, transferring from a bed to a chair, and climbing stairs are some of the activities that are included. A patient's participation in each of the following activities is verified by determining whether they performed the activity (yes or no), information was extracted from the occupational therapy documentation. The activities in question were ambulation, bed mobility, and transfers. It was determined, on the basis of the nursing data, whether it was documented that the patient had assumed specified positions or performed activities on a daily basis, or whether they were restricted from activity. To accomplish this, a thorough review of all of the documentation pertaining to the 2-hour patient position was carried out. Nursing position data was recorded as yes for the following categories if they were documented at any point throughout each day: activity order is bedrest; activity contraindicated status post procedure; activity contraindicated due to hemodynamic

instability; bed in chair position; sitting edge of bed; out of bed; up to bedside commode; up to chair; ambulate with assist; ambulate independently; up ad lib. For the following categories, data on nursing positions is recorded as yes: activity order is bedrest; activity The answer "yes" was selected for the nursing position data entry for the following categories because: the activity order is bedrest; the activity

Challenges and Difficulties in the PAC

We combed through the documentation for physical therapy and occupational therapy, in addition to the notes taken by the physicians, in order to find information on PAC complications. The patient's admission history and physical examination were documented in the physician's notes, along with daily progress notes, procedure notes, consult notes, alert notes, and discharge summaries. When any of the following events took place, including Dislodged PACs, accidental removal of PACs, pac-induced arrhythmias, or bleeding from PAC sites, complications were recorded as having been "observed."

Restriction of Freedom of Movement Caused by the PAC

The following limitations on mobility due to PAC were observed, and their occurrence was noted and recorded: fluctuating PAC values requiring modification or termination of physical therapy or occupational therapy session; patient discomfort related to PAC requiring modification or termination of physical therapy or occupational therapy session; presence of intra-aortic balloon pump (IABP), which requires a bedrest activity order when placed via femoral artery; need for nursing staff to adjust PAC during mobility; presence of intra-aortic balloon pump (IABP), which requires a bedrest activity order when placed via femoral artery; need

Results

Personalities of the Individual Patients

In total, 366 patients participated in this research project and provided their information. There were 141 males and 225 females, which indicates that males dominated the population by 61.5 percent (38.5 percent). This patient population had an average age of 87 years old, with the youngest patient being 18 years old and the oldest patient being 87 years old. The age distribution had a standard deviation of 14.7 years. The primary diagnoses are outlined in the table that can be found in the first column. The results of the calculation of the ejection fraction are presented in Table 2. A total of 2097 patient days were spent with patients having an indwelling PAC, with the average duration being 5.7 days (standard deviation of 5.9, minimum duration of 1 day, maximum duration of 46 days). When the PAC was taken away, 321 of the 366 patients were still conscious and breathing. This indicates that there was an 87.7 percent chance of survival.

Table 1: Diagnosis of the patient

Diagnosis	Incidence	Percentage
For Ventricular Assist Devices/Transplants	67	18.3
Transplantable 1A or 1AE	21	5.7
Dysrhythmia	103	28.1
Failure to breathe	33	9.0
Failure of the renal system	6	1.6
Infarction of the heart	49	13.4
Myocarditis/sepsis	16	4.4
Arrhythmia/syncope/cardiac arrest	48	13.1
PAC guided diuresis	23	6.3
Overall	366	100.0

Table 2: Fraction of ejection

	occurrence	percentage
lower than 10%	24	6.6
10–19%	176	48.1
20–29%	61	16.7
30–39 %	23	6.3
40–49%	15	4.1
Equal to or greater than 50%	44	12.0
Indeterminate	23	6.3
Overall	366	100.0

Mobility-Related Information: Exercise and Physical Therapy

There were 85 patients who were evaluated and treated by a physical therapist, which represents 23 percent of the total patient population. Patients who were fitted with an in-dwelling PAC received an average of 183 physical therapy sessions over the course of their treatment, with the number of sessions received by an individual patient ranging anywhere from one to twelve. The average number

of sessions of physical therapy that an individual patient receives is detailed in Table 3, which can be found here. Rolling was done in 75 of the 183 physical therapy sessions (40.9%), supine to sitting was done in 115 sessions (62.8%), sitting to standing took place in 153 sessions (83.6%), chair transfer was done in 79 sessions (43.2%), ambulation took place in 101 sessions (55.2%), and stairs were done in only one session (1%). (0.5percent).

Table 3: Session Counts for Patients Receiving Physical Therapy

Number of Sessions	Frequency	Percent
0	281	76.8
1	48	13.1
2	16	4.4
3	8	2.2
4	6	1.6
5	1	.3
6	1	.3

Number of Sessions	Frequency	Percent
7	2	.5
8	1	.3
10	1	.3
12	1	.3
Total	366	100.0

Information Regarding Occupational Therapy That Relates to Mobility

Patients who were fitted with an implanted PAC received a An occupational therapist saw 17 patients in total, with the number of sessions ranging from one to three for each individual patient. There were 15 patients who were evaluated and treated by an occupational therapist, which is equivalent to 4 percent of the total patient population. Each and every patient who took part in the occupational therapy programme was also required to take part in the physical therapy programme. 14 patients received a total of one session of occupational therapy, while one patient received a total of three sessions of occupational therapy. The other 351 patients did not receive any sessions of occupational therapy. Bed mobility was performed seven times (41.2 percent of the time), transfers were performed seven times (41.2 percent of the time), and

ambulation was performed four times. A total of seventeen sessions of occupational therapy were completed (23.5 percent).

Mobility Data: Nursing

Over the course of a total of 2097 days, during which time 366 patients wore PACs and provided daily position and activity data, we were able to collect this information. It is essential to keep in mind that the 2-hour position reports only documented the position or activity of the patient at the time that the report was being created, and they did not report all of the activities that took place within the time period of the 2-hour report. This is something that should be kept in mind at all times. Table 4 provides an overview of the occurrences of a variety of positions and activities, along with the frequencies that are associated with each one.

Table 4: Nurses Documenting an Occurring Position or Activity, Per Daily

Position or Activity	Frequency
Activity order is bedrest	319
Activity contraindicated status post procedure	26
Activity contraindicated due to hemodynamic instability	7
Bed in chair position	38
Sitting edge of bed	521
Out of bed	907
Up to bedside commode	78
Up to chair	343
Ambulate with assist	184
Ambulate independently	100
Up ad lib	126

Challenges and Difficulties in the PAC

The medical records of 366 patients who had been receiving PAC treatment for a total of 2097 days revealed a total of 15 occurrences of PAC complications (Table 5), which were spread across 15 different patients. These complications occurred during the course of treatment for a total of 2097 days. PAC-related complications included three instances of bleeding from the PAC site, five

instances of dislodgement or accidental removal of the PAC, and one instance of PAC-induced arrhythmia (7 occurrences). During any and all sessions of physical therapy and occupational therapy, not a single PAC-related complication was found or documented. This was the case even though both therapies were performed. In addition, the nursing staff has not reported any complications associated

with PAC in terms of the patient's ability to participate in mobility activities.

Table 5: PAC Complications Explained by Physicians.

<i>Site of the PAC is bleeding</i>
“Swan removed overnight as suture fell-out, mildly bleeding”*
“Prolonged bleeding from cordis”*
“Notable drop in platelets (179 → 73 → 47) with worsening hemostasis of left femoral Swan-Ganz site. Patient requiring occlusive pressure with alternating staff over left groin to maintain hemostasis.”
<i>Dislodging or accidentally removing the PAC</i>
“Patient pulled out Swan overnight”
“Patient accidentally disconnected swan tubing and lost about 10 cc of blood according to her nurse”
“The patient’s central line became slightly loose yesterday as the suture securing it fell off...”“Difficulty with swan overnight, appears to have dislodged”
“Swan removed yesterday as noted to be in right atrium”
<i>Arrhythmia caused by PAC</i>
“Upon return from fluoroscopic PA catheter placement... he was noted to have increased rate of atrial/sinus tachycardia”
“Increase in ectopy overnight. Chest x-ray revealed swan catheter in right ventricle – was then removed”
“At midnight had ventricular tachycardia likely due to swan in right ventricle”
“The patient’s swan was in the right ventricle. This caused a run of ventricular tachycardia”
“At approximately 12:36 AM, while undergoing pulmonary artery thermodilution via Swan-Ganz catheter, patient was noted to suddenly become tachycardic and hypotensive”
“In the cath lab, standard right intrajugular access was achieved with ease. Swan was inserted. When in the right ventricle, his heart rate was noted to be in the 40s and this was persistent”
“Swan placed and then had atrial versus sinus tachycardia which returned after adenosine. Swan pulled back and replaced”

*Note: In this case, "Swan" refers to Swan-Ganz catheters, otherwise known as PACs. In cardiology, a central cordis is an insertion point for a pac.

Restriction of Freedom of Movement Caused by the PAC

There were 366 patients who were admitted to the CICU, and 65 of them, which is 17.8 percent, were given an order to bedrest and an intra-abdominal pressure pump (IABP) for at least part of their stay. There were a total of 15 instances in which 12 patients exhibited PAC catheter mobility limitations throughout the course of 183 sessions of physical therapy. While each of the 15 patients had an indwelling PAC, the attending physician did not issue an activity order allowing the patient to leave their room and move around while they were receiving treatment for their condition. This was the situation in every one of the occurrences. There was not a single instance during the course of the 17 sessions of occupational therapy in which the mobility of the PAC catheter was restricted.

DISCUSSION

There is a dearth of literature that is supported by evidence on the subject of mobility guidelines for patients who are undergoing treatment with indwelling PACs. This

was a retrospective, descriptive study that was carried out on 366 patients with the goals of documenting Complications related to pacs and indwelling pacs, and how mobility activity was recorded for patients with indwelling pacs. The study was carried out with the participation of 366 patients. During the course of this study, the patients who took part had PACs implanted in their bodies for a cumulative total of 2097 days. During this time period, they engaged in activities such as bed mobility, transfers, ambulation, and even climbed stairs, as indicated by the documentation from physical therapy, occupational therapy, and nursing. There were 15 reports of PAC complications, such as bleeding, dislodgement, or arrhythmia; however, there were no reports of PAC complications during or in relation to participation in mobility activities. Because PAC complications were not reported during or following mobility activities, this might explain this. There have been no reports of any complications due to the PAC (Table 5).

During the course of the study, there were 15 instances in which PAC caused a patient's mobility to be

restricted while they were engaged in physical therapy. These patients all had PAC as a contributing factor. During this time period, patients who were diagnosed with PACs were referred to physical therapists so that they could be evaluated and treated. However, in order for the patient to be allowed to ambulate outside of their room, a specific order had to be given by the attending physician. In addition, it was mandatory for a registered nurse to be in the room at all times and keep an eye on the PAC waveform being displayed on a portable telemetry monitor. The phrase "lack of attending physician order for ambulation outside of room" was cited as the justification for PAC's decision to place limitations on a patient's mobility in each of the 15 instances in which such limitations were imposed. During sessions devoted to the ongoing pursuit of quality improvement with the Intensive Care Unit (ICU) staff, roundtable discussions on early mobility initiatives were held. As a result of these discussions, it was determined that this limitation posed a barrier to early mobility as well as the progression of mobility with physical therapy. The policy was changed as a direct result of this so that patients who had indwelling PACs were no longer required to have any additional activity orders in order to be allowed to ambulate outside of their room. This was made possible as a direct consequence of this.

There was a significant amount of variation in the ways in which patients in our facility who had an indwelling PAC were mobilised. This was due to the fact that each patient's situation was unique. According to the research that has been conducted, there is a comparable degree of variation in the functioning patterns of patients who are being treated in intensive care units at other facilities. 18–21

In the intensive care unit (ICU), there have been descriptions of programmes at a variety of facilities with the goals of standardising practises and increasing early mobility. These programmes provide guidelines on how to increase early mobility in a manner that is risk-free. 8,18,19 The findings of this study lend even more credence to the idea that early, safe mobility in the intensive care unit is beneficial, particularly for patients who have PACs. This is because the findings show that patients who move around earlier in the recovery process have a lower risk of complications.

In total, 366 patients were evaluated and treated with indwelling PACs; 85 patients received evaluation and treatment in the field of physical therapy, and 15 patients were evaluated and treated in the field of occupational therapy. When there was a PAC in place, the majority of the sample did not take part in any kind of physical therapy or occupational therapy; rather, their mobility activities were carried out under the supervision of the nursing staff. Occupational therapists also did not participate in the sample. The amount of activity as well as the type of activity were described in great detail in the notes that were

taken during physical therapy and occupational therapy. On the other hand, the nursing notes provide a much more generic account of the activities that were performed. The nursing documentation consisted of two-hour position reports, each of which required a selection to be made from a menu of options that had been determined in advance. These reports were turned in at regular intervals of two hours. During the time that the documentation was created, they provided information about the position or activity of the patient was completed, but they do not report all of the activities that took place within the preceding two hours prior to the time that the documentation was completed. As a direct result of this, the frequency, amount, and kind of mobility activities that the patients actually engaged in while they had an indwelling PAC are unknown. This is because the patients did not report their activity levels. Even though there were hundreds of repetitions of these activities that were performed under the supervision of nurses, The mobility activities that were extracted did not result in any PAC complications. None were reported to be a concern.

Limitations

This is a look back at previous work done at a single location with the intention of enhancing the level of care that was provided there. For the purpose of nursing documentation of mobility activity, there was only a limited amount of frequency information available because the data were obtained in a retrospective manner. There is also a limitation in the ability of the study to be generalised. Patients with a variety of diagnoses or levels of acuity can be admitted to acute care settings of varying sizes. This is because the study only included a single institution. This research does not investigate the efficacy of treatments like physical therapy or occupational therapy; rather, it merely reports on the different types of During the sessions, there was a lot of movement. Documentation will typically describe an event as having taken place "overnight" or "last evening," even though the precise timing of PAC complications is unknown. The final limitation of the study, which is also a limitation of all other studies of this kind, is that we were unable to describe the kinds of mobile activities that can lead to a PAC becoming dislodged. This is a limitation that is shared by all studies of this kind. Instead, we were only able to document activities that took place but could not be attributed to causing adverse PAC events such as dislodging the PAC.

CONCLUSION

Over the course of 29 months, 366 patients who were being treated in the intensive care unit of an academic medical centre participated in activities such as bed mobility, transfers, ambulation, and even stair climbing. These activities took place while the patients were receiving care. These patients did not experience any complications stemming from their PACs while taking part

in these mobility activities, either directly or indirectly related to their participation in these activities. We are the first researchers to make the groundbreaking discovery With a PAC in place, patients in the CICU can participate in mobility activities. During the course of the study, there were no complications related to the participation of Mobility activities performed by patients who have an indwelling PAC. First time in our experience, resuscitation patients with an indwelling PAC were able to participate in mobility activities when in a CICU. Although studies

support the use of physical therapy and early mobility as a safe and effective intervention in ICU patients,^{8,9} we are the first to observe this. It is essential for the direction of future research to include a prospective measurement of the effects of physical therapy on patients who have an indwelling PAC, as well as the identification of the most effective treatment protocols. Duration of a patient's hospital stay after a physical therapy intervention, their ability to be discharged, and their financial outcomes ought to be factored into these best practises.

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