

# Research Protocol

## Complications related to a Percutaneous Nephrostomy Catheter

### Project Group:

Rikke Knudsen

Erica Grainger

Lone Aarvig

Susanne Kristensen

Bente Thoft Jensen

## Introduction

Obstruction in the upper urinary tract is a common condition and can be caused by cancer, congenital malformation or kidney stones (Allen,2012; Siddig,2012). The obstruction causes hydronephrosis and patients need immediately treatment to reduce the risk of permanent kidney failure (Allen,2012;Siddig,2012;Walter,2009). In 2011 approximately 1000 people were referred to Danish hospitals with a diagnosis of hydronephrosis caused by obstruction of the ureteropelvine transition. Approximately 500 people were referred with hydronephrosis caused by stones in the ureter or the kidney (National Board of Health;Siddig,2012)

Often patients are treated with a percutaneous nephrostomy until the acute course of obstruction or edema of the upper urinary tract is treated appropriately. A percutaneous nephrostomy is a safe urinary diversion technique, and it offers excellent drainage (Allen,2010; Ekici,2001). The nephrostomy catheter is placed in the kidney through the skin. Its function is to secure draining the urine, and this requires a urine bag. The nephrostomy is usually placed under local anesthetic (Allen,2010; Siddig,2012). The procedure of percutaneous nephrostomy was first described in 1974, and since the incidence rate has become increasingly prevalent (Kræmer,2009; Fitzgerald,1989; Siddig,2012; Walter,2009).

Having a nephrostomy is often an acute procedure and patients are according to national guidelines referred to high specialized urology departments for immediately treatment (Danish Standard,2012). However some patients are chronically obstructed and need a long term or permanent nephrostomy, which is common among patients with hydronephrosis caused by cancer (Kræmer PC,2009;Siddig,2012;Shekarriz,1999).

In case of long term care or permanent nephrostomy, the catheter needs to be changed after 3 months. The procedure of placing and re-placing a nephrostomy catheter is performed supported by the Department of Radiology and guided by ultrasound (Allen,2010; Siddig,2012). However, information concerning daily care, complications or practical problems related to the nephrostomy catheter or the procedure is handled by the Department of Urology, who are also responsible for acute treatment, observation and problem-solving.

Department of Urology at Aarhus University Hospital (AUH), Denmark (DK) recommends changing the dressing two to three times a week and according to national guidelines the urine bag needs to be changed once a week (Danish Standard,2012; Department of Urology). The evidence for bandage changing procedure according to a nephrostomy is lacking, and the existing literature is ancient and not reviewed (Fitzgerald,1989; Sage,1991). Neither much research has been done in this area with regards to preventing infections and complications (Siddig,2012).

Some patients need homecare providers to assist with the change of the dressing and urine bags. In Denmark, the home care centers are trained to assist patients having a nephrostomy catheter. It is well known from other uro-stomas that being dependent on public healthcare and having a

sort of stoma, has a paramount impact on daily life and quality of life (Brown,2005; Geng et al,2009). Also the need of a urine bag can have an impact on and reduce a patients quality of life (Allen,2010).

The procedure and problems related to having a nephrostomy catheter are poor described in the literature and the evidence of recommendations is low. However, the patients are often having problems such as infections, failure function and dressing complications. In fact experience from clinical practice is an increasing incidence of patients having problems related to their nephrostomy catheter (Ekici,2001; Shekarriz,1999). Some patients even express an experience of loss of independency due to regularly problems with function of the catheter and thereby impaired quality of life (Allen,2010). Moreover a high rate of complications related to life with nephrostomy and sometimes even life threatening conditions caused by impaired function of the nephrostomy or the dressing may result in repeated admission to the hospital (Allen,2010;Danish,2012). The circumstances have pivotal consequences especially for the patient but also from a health-economic perspective (Allen,2010;Shekaariz,1999). In general there is a lack of evidence describing the actual health care burden of having a nephrostomy, the incidence of readmission and related causes but also the experience from a patient perspective.

This project concerns one of the core elements in urological nursing and the issues stated above are much underreported in urological nursing. This study will investigate and determine the burden of complications and patient related problems when living with a nephrostomy. A preventive approach identifying the patient profile in these pathways may facilitate patients living with a nephrostomy and reduce clinical complications and the burden related to health care in general.

## **Objective**

The aim is to investigate and identify complications and patient –reported problems related to having a percutaneous nephrostomy catheter among urology patients.

## **Literature**

A literature study has been conducted and the findings have been integrated in the introduction. The literature study was performed in three databases, Pubmed, Cinahl and Scopus, using a search strategy including medical subject headings (MeSH terms) and free text search strategies when Mesh terms was not available. The MeSH terms used in the strategic search were percutaneous nephrostomy, nephrostomy dressing, nephrostomy and infections, nephrostomy complications, nephrostomy drainage, nephrostomy, nursing, nursing care and quality of life. All words were searched as single words and combination with free text.

The criteria for inclusion in the study were relevance to the overall aim in specific and to urological nursing and urological in specific. Also, the level of evidence and quality of the paper was evaluated, including the age of the literature. As referred in the introduction the number of relevant literature was rare, and the existing literature is old.

### **Relevance to urology nursing**

This study will identify complications and patient-related problems related to having a nephrostomy catheter, which we consider is a core element in urology nursing. Having clarified the amount, the character of complications and the healthcare burden in relation to a nephrostomy catheter could add to knowledge regarding best management of specific complications and interventions. Such a study could reveal a more concrete information on the complication profile and thus improve relevant management and target future intervention areas. We will potentially be able to launch recommendations for an optimized clinical pathway in urological nursing practice. A preventive effort may have a positive impact reducing morbidity and patients-concerns, the number of acute admissions to the hospital but also offer the home care units a better information and support.

## **Methods**

The study is a descriptive study based on data from medical and nursing records. The study population includes urological patients with problems in relation to their percutaneous nephrostomy, referred to AUH in March 2011- march 2013. A systematic review of patient records will be performed by two persons.

Every complication related to having a nephrostomy catheter will be registered and placed into a standardized protocol and entered in a nephrostomy database. Permission from The Danish Data Protection Agency will be required as well as from the National Board of health to obtain information from medical records (National Board of Health; National Protection Agency).

Patient-outcome will be described by any patient-history, complication or problem related to a percutaneous nephrostomy for an example hospital admissions, visiting the out-patient clinic, dressing problems, skin infections, urosepsis, malfunction, incorrect placement, pain and impact on daily living.

Ethical considerations:

Data will be anonymized. Data collection methods will be approved by the national Data Protection Agency. The study will not provide any harm to the patients. However, good clinical practice will prescribe the local regional ethical and scientific committee will be informed.

## **Statistics**

All clinical and demographic variables will be reported as proportions with a 95% confidence interval (CI). Investigating associations between any hospital contact and indicators as mentioned above will be reported as RR with a 95% CI. When having appropriate amount of data information a multivariate model including relevant parameters predicting hospital admission and reduced complication will be performed.

## **Feasibility**

Timetable

August 2012-1.December 2012: Finalize the research protocol for the EAUN Annual Meeting in Milan 2013. Apply for permission to sample data collection (Danish Data Protection Agency and National Board of Health).

September 2012-March 2013: Create a standardized protocol for data sampling, establishing a database in Epidata and hence entering data in the database.

March 2013- March 2014: Ongoing collecting data, analysis and presentation in peer reviewed journals and at relevant congresses.

### **Budget**

Establishing of clinical database and datamanagement	2000 Euro.
Nursing hours for data sampling , entering data, patient reported problems (N=150)/2 h	8000 Euro
Analyzing and interpretation: - Included above	
Total costs	10000 Euro

### **Conclusion/Relevance**

The clinical perspective of this study is to identify and clarify the clinical experience of increasing contact to hospital or outpatient clinic due to complications related to a nephrostomy catheter.

Secondly, systematic documentation of complications related to living with a nephrostomy catheter will qualify clinical practice and thereby possibly prevent some of the complications. Increasing evidence may optimize the quality of care and induce a positive impact on patient outcome, health - economic and enlighten patient perspectives.

### **References**

Literature list is attached

### **Possible conflicts of interest**

To our knowledge there are no any possible conflicts of interest.

## References:

Allen DJ et al. Percutaneous urinary drainage and ureteric stenting in malignant disease. *Clinical Oncology* 2010

Brown H, Randle J. Living with a stoma: a review of the literature. *Journal of Clinical Nursing* 2005

Danish Standard (*Document in Danish*). Dansk standard: "Styring af infektionshygiejne i Sundhedssektoren. del 6: Krav til urinvejskatetre og urininkontinenshjælpemidler" DS2451-6, 2.udgave 2010 (Afventer godkendelse)

Ekici S, Sahin A, Ozen H. Percutaneous nephrostomy in the management of malignant ureteral obstruction secondary to bladder cancer. *Journal Endourology* 2001.

Geng et al. Good practice in Health Care. Incontinent Urostomy. EAUN European Association of Urology Nurses 2009

Kræmer PC, Borre M. (*Document in danish*) Aflastning af tumorbetaget obstruerede øvre urinveje ved prostatacancer. *Ugeskrift for Læger* 2009

National Data Protection Agency (Region Midtjylland):  
<http://www.regionmidtjylland.dk/sundhed/faginfo/forskning/datatilsynet>

National Board of Health (Sundhedsstyrelsen):  
<http://www.sundhedsstyrelsen.dk/Tilsyn%20og%20patientsikkerhed/Patientjournaloplysninger.aspx>

National Database on Statistics (Sunhedsstyrelsen):  
<http://www.ssi.dk/Sundhedsdataogit/Dataformidling/Sundhedsdata.aspx>

Nephrostomy dressing (*Document in danish*) Department of Urology, Århus Universityhospital (Regionale dokumenter; Organisatoriske PRI, Hygiejne, 10.6 Forbindskift – infektionshygiejniske forholdsregler 1.6.10.6)

Sage SJ. Nephrostomy dressing change procedure. *Ostomy Wound Management* 1991

Shekarriz B et al. Outcome of palliative urinary diversion in the treatment of advanced malignancies. *Cancer* 1999

Siddig DM, Darouiche RO. Infectious complications associated with percutaneous nephrostomy catheters: Do we know enough? *The International journal of artificial organs* 2012

Walter S. (*Document in danish*) Nefrostomi – aflastning af de øvre urinveje ved nonmalign og malign lidelse. *Ugeskrift for Læger* 2009

Complications related to a Percutaneous Nephrostomy Catheter, Rikke Knudsen, Department of Urology, Århus University Hospital