



# International Journal of Nursing and Midwifery

Volume 7 Number 6, June 2015

ISSN 2141-2456



*Academic  
Journals*

## ABOUT IJNM

The **International Journal of Nursing and Midwifery (IJNM)** is published monthly (one volume per year) by Academic Journals.

**International Journal of Nursing and Midwifery (IJNM)** is an open access journal that provides rapid publication (monthly) of articles in all areas of the subject such as family practice, women's health care, emergency nursing, psychiatry, geriatrics, pediatrics etc.

The Journal welcomes the submission of manuscripts that meet the general criteria of significance and scientific excellence. Papers will be published shortly after acceptance. All articles published in IJNM are peer-reviewed.

## Submission of Manuscript

Submit manuscripts as e-mail attachment to the Editorial Office at: [ijnm@academicjournals.org](mailto:ijnm@academicjournals.org), [ijnm@acadjourn.org](mailto:ijnm@acadjourn.org). A manuscript number will be mailed to the corresponding author shortly after submission.

For all other correspondence that cannot be sent by e-mail, please contact the editorial office (at [ijnm@academicjournals.org](mailto:ijnm@academicjournals.org), [ijnm@acadjourn.org](mailto:ijnm@acadjourn.org)).

The International Journal of Nursing and Midwifery will only accept manuscripts submitted as e-mail attachments.

Please read the **Instructions for Authors** before submitting your manuscript. The manuscript files should be given the last name of the first author.

## Editors

**Dr. Alleene M. Ferguson Pingenot**

*California State University, Stanislaus  
One University Circle DBH 260, Turlock, CA 95382  
USA*

**Dr. Andrew Crowther**

*Charles Sturt University  
Leeds Parade, Orange, New South Wales 2800,  
Australia*

**Dr. Jacinta Kelly**

*School of Nursing & Midwifery  
24 Dolier St, Dublin 2  
Ireland*

**Dr. Jafar Alasad**

*College of Nursing, King Saud bin Abdulaziz  
University for Health Sciences  
(MC 3105)  
King Abdulaziz Medical City - National Guard  
Health Affairs  
P.O. Box 22490, Riyadh 11426,  
Saudi Arabia*

**Dr. Fintan Sheerin**

*School of Nursing and Midwifery, Trinity College  
Dublin,  
24 D'Olier Street, Dublin 2.  
Ireland*

**Prof. Helen McCutcheon**

*University of South Australia, School of Nursing &  
Midwifery  
GPO Box 2471, Adelaide, South Australia, 5001,  
Australia*

**Dr. Panagiotis Christopoulos MD,MSc,PhD,IFEPAG**

*2nd Dept. Ob/Gyn  
Medical School, University of Athens  
1 Hariton street,  
14564, N. Kifissia, Athens,  
Greece.*

**Dr. Arun Kumar**

*Manipal College of Medical Sciences  
Department of Biochemistry, Pokhara, Nepal  
India*

**Dr. Harunor Rashid**

*Barts and the London Queen Mary's School of  
Medicine and Dentistry, London  
The Blizard Building, 4 Newark Street, London E1  
2AT,  
United Kingdom*

## Editorial Board

**Dr. Sawsan Majali**

*Dar Al Hekma College  
P.O.Box 34801, Jeddah 21478  
Saudi Arabia*

**Dr. Patricia L. Riley**

*US Centers for Disease Control and Prevention (CDC)  
1600 Clifton Road, NE  
Mail Stop E-41  
Corporate Square Bldg 1, Rm 2409  
Atlanta, GA  
30329-1902  
USA*

**Dr. Lucille van der Westhuizen**

*University of Namibia  
P/B 13301 Windhoek,  
Namibia*

**Dr. Imtiaz Wani**

*S.M.H.S Hospital, Srinagar  
Amira Kadal, Srinagar  
India*

## ARTICLES

### Research Articles

- |  |            |
|--|------------|
| <b>Euthanasia: A fight for respect and autonomy</b>  | <b>104</b> |
| Sehrish Pirani and Shirin Badruddin  |            |
| <b>Systematic bladder scanning identifies more women with postpartum urinary retention than diagnosis by clinical signs and symptoms</b> | <b>108</b> |
| Marie Blomstrand, Roland Boij, Lennart Christensson and Peter Blomstrand   |            |

Case Report

## Euthanasia: A fight for respect and autonomy

Sehrish Pirani\* and Shirin Badruddin

School of Nursing and Midwifery, Aga Khan University, Pakistan.

Received 8 April, 2015; Accepted 19 May, 2015

**This study discusses an ethical dilemma on “Euthanasia”. The purpose of this study is to analyze the ethical controversies associated with euthanasia. This study will present an in-depth analysis of a clinical scenario with regard to the concept of health-related quality of life, patient’s autonomy, and other legal, social, and religious perspectives. A four quadrant approach is performed to analyze the scenario.**

**Key words:** Euthanasia, quality of life, autonomy, four quadrant approach.

### INTRODUCTION

Euthanasia is defined as a process which is aimed to cause painless death in a person to end his/her life (Bukhardt and Nathaniel, 2002). It is classified in two ways: active or passive and voluntary or involuntary. Active euthanasia can be referred as an act of commission; for example, something is done to end the patient’s life. Whereas, passive euthanasia can be referred as an act of omission; for example, something is not done that would have preserved the patient’s life (Fry et al., 2011). Voluntary euthanasia comes as a patient’s request for taking actions to end his/her life or to withdraw all lifesaving treatments. On the contrary, involuntary euthanasia occurs when the patient’s life is ended without his/her choice disregarding his competency to decide (Bukhardt and Nathaniel, 2002).

In addition, euthanasia can also be defined with respect to being assisted in suicide. Assisted suicide is defined as, “the patients receive the means of death from someone, such as a physician, but (the patient) activate the process themselves” (Bukhardt and Nathaniel, 2002). Whereas, active assisted voluntary euthanasia is cited as “an act in which the physician both provides the means of

death and administers it, such as lethal dose of medication” (Bukhardt and Nathaniel, 2002).

### CASE REPORT

Mr. X has been struggling for almost two decades against his quadriplegic state, as a result of a spinal cord injury. His mother had been taking care of him for a long time and was a great support to him, as was his fiancée, who was with him despite knowing the fact that he will never be able to walk on his own feet and perform his activities of daily living by himself. Even though receiving great support from his loved ones, he was still depressed. He knew that his disease was not curable and his prognosis was poor. He was on continuous renal dialysis therapy. Moreover, he was aware that all the treatment options were futile as his condition was deteriorating day by day. His prolonged suffering made him question about his quality of life and he demanded euthanasia.

Mr. X was a renowned businessman by profession. Because he had earned a lot of fame and money at a

\*Corresponding author. E-mail: [sehrish.pirani@gmail.com](mailto:sehrish.pirani@gmail.com)

Author(s) agree that this article remain permanently open access under the terms of the [Creative Commons Attribution License 4.0 International License](https://creativecommons.org/licenses/by/4.0/)

very young age, he came across a number of envious people who made every effort to bring suffering to him.

Not surprisingly, one day, he was betrayed by his rival via a car accident. When he regained his consciousness, he found that now he had to remain quadriplegic and bed-ridden for his entire life. After twenty years of suffering, he finally decided to opt for euthanasia. His demand for voluntary euthanasia caused everyone in the care team to confront a number of ethical, legal, religious and societal issues. Before analyzing this case scenario, let's understand what euthanasia is.

On the basis of the definitions of euthanasia, it could be concluded that Mr. X's case was that of active voluntary euthanasia; whereby, he required the assistance of his physician to end his life. Moreover, he wanted legal support in order to protect himself and his doctor from being blamed for attempting euthanasia. Here, the dilemma appears: whether euthanasia should be allowed to him or not? In order to critically analyze Mr. X's case, a four quadrant's approach will be used.

#### **Four quadrants approach**

This approach was given by "Jonsen, Siegler and Winslade" in 1982 (Sokol, 2008). It is used by clinicians as it provides a structured framework in order to reach an "informed, morally justified decision" (Sokol, 2008). This approach is applied to Mr. X's case because it analyzes his case from all possible angles that could lead to a sound and justified ethical decision. The approach consists of four themes or quadrants that are "medical indications, patient preferences, quality of life and contextual features" (Sokol, 2008) as described below:

##### ***First quadrant-medical indications***

In this quadrant, the patient's medical condition is analyzed, treatment options are identified, and all the treatment options are ruled out that may benefit the patient in any way (Sokol, 2008).

##### ***Second quadrant-patient preferences***

In this quadrant, the patient's wishes and desires are given importance, provided if the patient is competent. However, if the patient is not competent, his presumed wishes are assessed (Sokol, 2008).

##### ***Third quadrant-quality of life***

In this quadrant, the aim is to consider all those aspects that may ensure the patient's quality of life. Also, since quality of life has a subjective component to it too, this quadrant views it in light of the patient's preference

(Sokol, 2008).

#### ***Fourth quadrant-contextual features***

In this quadrant, the case scenario is analyzed from different contextual perspectives that may have an impact upon the decision. These include, but are not limited to, "economic, religious and cultural factors, confidentiality issues, and the impact of the decision on the patient's family and medical team" (Sokol, 2008). Considering Mr. X's situation, propositions based on the above mentioned controversy are: whether the option of euthanasia is justified; whether Mr. X has a right to decide about his life and treatment; whether the society should support his autonomy for euthanasia; and whether health care professionals should support his autonomy for euthanasia. Let's analyze these propositions through the four quadrant approach.

#### **MEDICAL INDICATIONS**

It can be inferred from Mr. X's case that he has compromised physiological and psychological needs. He was totally dependent upon his caregivers for all trivial tasks. It is apparent on medical grounds that Mr. X's condition was deteriorating and since he was quadriplegic, there was hardly any chance of his recovery in the near future. Therefore, sustaining his life was medically considered futile. Moreover, principle of non-maleficence supports euthanasia with its moral rules of avoiding pain and suffering (Beauchamp and Childress, 2001). In this scenario, medical advancements such as hemodialysis and ventilator support are not appropriate for Mr. X because it would only prolong his life, continue his suffering, and provide lots of pain rather than provide him good quality of life. Therefore, Mr. X's medical indications suggest that his request for euthanasia is justified.

#### **Patient's preferences**

Mr. X is an autonomous and competent person. Autonomy is defined as "having capacity of an individual to make an informed, un-coerced and rational decision" (Beauchamp and Childress, 2001). According to Beauchamp and Childress (2001), a competent individual has cognitive skills and independence of judgment. Mr. X preferred dying over living a dependent and compromised life. He was well aware of his futile treatment, poor prognosis, and his sufferings related to his physical health, his psycho-social wellbeing, and reduction of his financial resources. In his case, withdrawing treatment will end his life at once rather than making him slowly die every day. As he was already going through multi organ failure, restricting him for a

natural death would cause more suffering and harm to him instead of providing him dignity and peaceful death. So active euthanasia is well justified in this case. Therefore, on the grounds of the principle of beneficence, which allows removing conditions that might harm others and prevent harm from occurring to others (Beauchamp and Childress, 2001), the act of euthanasia is justified. Moreover, based on the rights-based theory, a country's law should respect the right of a competent patient's decision and allow him to opt for voluntary euthanasia. However, it is very important to understand here that if euthanasia is allowed for Mr. X, then indirectly it means that the legal system supports euthanasia. Therefore as a consequence, every competent person who is suffering through any misery would urge for euthanasia. Ultimately, it would be very difficult to deal with all such cases. Yet, if the legal system supports Mr. X's wish, this will affirm that the law considers every individual's case as a separate case. So it is important that the legal system should evaluate individual needs of patients and decides for the patients accordingly.

### **Quality of life**

The notion of quality of life of Mr. X is associated with 'no more suffering'. Therefore, the use of medical technologies (hemodialysis and ventilator) will be useless since it will only increase his suffering. Additionally, patients with prolonged suffering often undergo depression and lose their hopes. Considering this, prolonging Mr. X's life is not worthwhile.

Although Mr. X had a strong social support initially, it is uncertain whether his social affiliation with others would persist in the long run since he was lacking finances. His compromised state is depicting his poor quality of life and therefore, on the basis of medical futility and potentially compromised quality of life, a strong case can be made to allow Mr. X for euthanasia.

### **Contextual features**

#### ***Economical aspect***

Initially, the patient was financially sound. He bore all the costs of his treatment. Since his condition was a prolonged state of despair and suffering, he would have to bear a financial setback soon. Lack of finances would lead to loss of caregiver's support and availability of continuous treatment. Hence, keeping the patient on ventilator for a long time is least likely to be beneficial for him. These evidences suggest that without finances, care cannot be continued. Adding to this fact, his futile state supports that he should not be forced to bear such high costs of treatment without any beneficial outcome. It is important to consider that if lack of finances becomes a

reason to support euthanasia, then people might argue that those people who are underprivileged or are suffering from extreme poverty and hopelessness should also be allowed for euthanasia. People who are fed up of their lives, because of poverty or due to any other reason, are physically competent and can decide independently to end their life without involving their loved ones, society, or law. However, in this case, Mr. X is quadriplegic and he is dependent upon others. Therefore, euthanasia is justified for him.

### ***Social aspect (Society and Justice)***

Opponents of euthanasia will justify their reasons on the basis of ethics of care and will oppose the patient's decision for euthanasia. Being a member of society, Mr. X has a right to live and he will be accommodated with the available resources. Whereas, the pro-euthanasia lobby may feel that people like Mr. X are non-productive, consume more resources, and burden society; thus, they should be allowed to die. They will also think that advanced medical resources which are only utilized by him can be shared among all those who require it. These people after their recovery will strengthen the economy, the standards of living, and the welfare of society. Therefore, euthanasia is justified for quadriplegic patients who are not beneficial to the society. This decision is a hard decision and has no strong ethical grounding. The value of human life cannot be measured by how much economic outcome terminally ill patients can give. Resources should be allocated to the terminally ill patients as well. Johnstone (2010) stated, "Justice is a basic human need and as such warrants a broader conceptualization in nursing discourse that goes beyond its conventional conceptualization as a legal or ethical".

### ***Religious aspect***

Euthanasia is not appreciated in all major religions. From a Buddhist's perspective, it is considered immoral. This is on the basis of their belief that lives should be saved at all costs (Keown and Keown, 1995; Traina, 1995). In addition, Islam believes that life and death are in the hands of God and therefore, health care professionals have no right to take away another's life. They consider it as a gift of God (Engelhardt and Iltis as cited in Yousuf and Mohammed Fauzi, 2012). Muslims also believe that whatever suffering is in one's fate, it is an opportunity for him/her to neutralize his sins through suffering before he moves to heaven. Muslims believe that everyone has to die one day but to decide which day, is not in human's hand. Furthermore, suicide and killing innocent people is prohibited in Islam (Yousuf and Mohammed Fauzi, 2012). Besides Buddhism and Islam, Christianity also disregards this concept. According to their opinion, life is meant to



be cherished. If a patient suffers through a terminal illness, then one of the alternative options would be to keep him under hospice services (Keown and Keown, 1995). Mr. X belonged to a Christian religion, where the religion teaches him to cherish his life. On the basis of religious preaching; euthanasia is not justified for him.

### **Legal aspect**

Legally, it is possible that if euthanasia is legalized then there is a great possibility that it would be misused. Marginalized groups in the society might wish to end their lives because of their sufferings (Beauchamp and Childress, 2001). This study can't legalize euthanasia because there might be chances that every autonomous individual asks for mercy killing. In Mr. X's case, it is justified. However, it varies on individual basis. Therefore, euthanasia should not be legalized. Moreover, if euthanasia is allowed legally, then people in dire need of euthanasia would not have to strive for long to justify their case. This means that it will reduce the suffering of people like Mr. X rather than wasting their time, energy, and money for court justice. Countries like the Netherlands have legalized euthanasia and health care professionals who feel comfortable to assist patient with euthanasia are protected in legal terms (Singer, 2003).

### **IMPACT OF EUTHANASIA UPON THE FAMILY AND THE MEDICAL TEAM**

The concept of euthanasia is well supported in the light of utilitarian theory. Utilitarianism is defined as "right action is that which has greatest utility" (Burkhardt and Nathaniel, 2002). According to this concept, any action is considered ethically just if it has its utility to a large number of people. The utility in Mr. X's case is alleviation of his own suffering and the suffering of his mother who was going through the pain of his son's disability and pitiful life. If the theory of utilitarianism is applied upon his case and euthanasia is allowed, then it would not only alleviate Mr. X's suffering, but also, the suffering of his mother and other close friends and relatives. Hence euthanasia is justified on the basis of utilitarian theory. A deontologist might not assist the patient to die. As according to this concept, the moral obligation of a health care professional is to perform duty, and their duty is to save life and not to kill (Beauchamp and Childress, 2001). Hence, if euthanasia is allowed, then it might challenge the patient's physician as he might question his duty; which is to save people's lives.

### **CONCLUSION**

In the light of the four quadrant approach, various perspectives were analyzed from four dimensions: medical indications, patient's preference, quality of life and contextual features. The ethical theories and principles that were reviewed within each dimension appeared as two sides of the same coin in answering the euthanasia issue for Mr. X. These perspectives in Mr. X's case support his plea for euthanasia except the religious aspect which very strongly condemns it. Hence, Mr. X can be allowed for euthanasia. However, euthanasia cannot be generalized and it is recommended that every individual case should be analyzed independently.

### **Conflict of Interest**

The authors have not declared any conflict of interest.

### **REFERENCES**

- Beauchamp TL, Childress JF (2001). Principles of Biomedical Ethics (5th Ed.). New York: Oxford.
- Burkhardt MA, Nathaniel AK (2002). Ethics and issues in Contemporary Nursing (2nd Ed.). Columbia: Delmar.
- Fry ST, Veatch RM, Taylor CR (2011). Case Studies in Nursing Ethics, Fourth Edition. Johnes & Bartlett learning LLC: USA.
- Keown D, Keown J (1995). Killing, karma and caring: Euthanasia in Buddhism and Christianity. J. Med. Ethics 21(5):265-269.
- Johnstone MJ (2010). Nursing and justice as a basic human need. Nurs. Philos. 12(1):34-44.
- Singer P (2003). Voluntary euthanasia: A utilitarian perspective. Bioethics 17(5-6):526-541.
- Sokol DK (2008). The "four quadrants" approach to clinical ethics case analysis; an application and review. J. Med. Ethics 34(7):513-516.
- Yousuf RM, Mohammed Fauzi AR (2012). Euthanasia and physician-assisted suicide: A review from Islamic point of view. Int. Med. J. Malaysia 11(1):63-68.

*Full Length Research Paper*

# Systematic bladder scanning identifies more women with postpartum urinary retention than diagnosis by clinical signs and symptoms

Marie Blomstrand<sup>1\*</sup>, Roland Boij<sup>1</sup>, Lennart Christensson<sup>2</sup> and Peter Blomstrand<sup>3,4</sup>

<sup>1</sup>Department of Obstetrics and Gynecology, County Hospital Ryhov, Jönköping, Sweden.

<sup>2</sup>Department of Nursing, Jönköping University, Jönköping, Sweden.

<sup>3</sup>Department of Clinical Physiology, County Hospital Ryhov, Jönköping, Sweden.

<sup>4</sup>Department of Natural Science and Biomedicine, Jönköping University, Jönköping, Sweden.

Received 13 March, 2015; Accepted 5 May, 2015

**This study aims to determine if systematic use of bladder scan accurately identifies more women with postpartum urinary retention compared with diagnosis using clinical signs and symptoms, alone. A prospective, quasi experimental study was performed at the Department of Obstetrics and Gynecology, County Hospital Ryhov, Jönköping, Sweden. A total of 252 women participated in this study; they were women who gave birth between the period of March and April, 2011. One hundred and twenty-six women were included in an experimental group, they received ultrasound scanning of post-void residual bladder volume for identification of urinary retention; patients were catheterized if post-void residual bladder volume was  $\geq 400$  ml. A control group of 126 women, matched by parity and age, were also included. The latter group were catheterized on clinical signs or symptoms of urinary retention. Twenty-one women in the experimental group were identified as having post-void residual bladder volume  $\geq 400$  ml compared to 9 in the control group, verified by catheterization ( $p < 0.05$ ). Eleven women in the experimental group had covert urinary retention with a post-void residual bladder volume of 400 to 1200 ml. No woman who gave birth by caesarean section was identified with postpartum urinary retention. Univariable logistic regression analyses identified seven risk indicators of postpartum urinary retention: first pregnancy, delivery with use of ventouse, oxytocin infusion, epidural analgesia, second stage of  $>120$  min, active pushing  $>30$  min and perineal tear. Oxytocin infusion and perineal tear were independent risk indicators in a multivariable regression analysis. Systematic bladder scanning identifies more women with postpartum urinary retention in women with vaginal delivery than diagnosis by clinical signs and symptoms, alone. Oxytocin infusion and perineal tear are independent risk indicators for urinary retention in new delivered women.**

**Key words:** Postpartum urinary retention, postpartum voiding dysfunction, bladder scanning, catheterization, birth.

## INTRODUCTION

Postpartum urinary retention (PUR), or voiding dysfunction, is a well-known phenomenon in the puerperium (Yip et al., 2004; Mulder et al., 2014). The incidence of PUR varies from 0.5 to 45% in women who have just delivered

babies. This variability among studies may be due to an unclear definition for PUR (Kekre et al., 2011). PUR has been defined as the inability to void adequately within 6 h after delivery. PUR can be sub-divided into clinically

covert and overt PUR (Carley et al., 2002; Glavind and Bjork, 2003; Yip et al., 2004; Ismail and Emery, 2008; Humburg et al., 2011; Kekre et al., 2011). Covert PUR refers to asymptomatic women with post-void residual bladder volume (PVRBV)  $\geq 150$  ml (Yip et al., 2004; Kekre et al., 2011). Overt PUR is the inability to void spontaneously within 6 h of vaginal delivery or removal of a urinary catheter after birth (Carley et al., 2002; Yip et al., 2004; Kekre et al. 2011).

The pathophysiology of PUR is likely to be multifactorial. The bladder muscle loses tone during pregnancy, possibly as a result of hormonal changes (Liang et al., 2014). Bladder capacity, urethral length and urethral closing pressure increase. A non-pregnant woman has a maximal bladder capacity of 350 to 450 ml; during pregnancy, the capacity may increase to 1000 to 1200 ml (Saultz et al., 1991). The postpartum bladder tends to be hypotonic, and physiological changes in the bladder persist for days to weeks after delivery (Saultz et al., 1991). The pelvic floor muscles and pudendus nerve may be damaged during labour, resulting in reduced bladder sensitivity (Saint et al., 2009). Peri-urethral and valvular oedema may cause obstruction (Mulder et al., 2014). Finally, reduced pressure from the uterus after birth may lead to incomplete bladder emptying during the first hours to days after delivery (Saultz et al., 1991). PUR is more frequently observed after instrument-assisted birth, and in women who received regional analgesia or prolonged labour or suffered lower genital tract laceration during birth (Carley et al., 2002; Humburg et al., 2011; Buchanan and Beckmann, 2014). Post-void residual urine is a source of urinary tract infections. A distended bladder may lead to detrusor damage, which requires catheterization (Carley et al., 2002; Zaki et al., 2004). PUR may be a transient, spontaneous healing phenomenon or may result in disturbed bladder function and the inability to void. However, the long-term consequences of PUR remain largely unknown (Yip et al., 2002; Mulder et al., 2014).

It may be difficult to diagnose PUR, especially in asymptomatic women, as this relies on an accurate estimation of PVRBV. Abdominal palpation may reveal an abnormal fundal height or palpable bladder. However, bladder volumes less than 300 ml are not easily detected by abdominal palpation; therefore, abdominal palpation alone is not recommended as a diagnostic method. Abnormal bleeding, abdominal pain, incomplete bladder emptying, weak urine beam, urinary incontinence and urinary infection are symptoms that may be associated with PUR. Catheterization is an accurate diagnostic and therapeutic method, but can lead to infection (Yip et al., 2004). Ultrasound scanning is non-invasive but ultrasound measurements may be inaccurate in women

who recently delivered (Teng et al., 2005; Altschuler and Diaz, 2006; Saint et al., 2009). The use of a bladder scan routine for identification of PUR is debatable (Mulder et al., 2014; Buchanan and Beckmann, 2014).

The aim of this study was to determine if systematic use of bladder scan accurately identifies more women with PUR than diagnosis by clinical signs and symptoms alone.

## MATERIALS AND METHODS

A total of 252 women who gave birth by vaginal or caesarean section during the period of March and April, 2011 at the Department of Obstetrics and Gynecology, County Hospital Ryhov, Jönköping, Sweden participated in this study. Six women did not participate because of difficulties to understand the Swedish language or they did not want to join the study. All women who were willing and able to participate were classified according to parity (primipara versus multipara) and age (Figure 1). One hundred and twenty six, that is every third consecutive women, were included to (I) an experimental group who received systematic bladder scanning and catheterization according to a new regimen for prevention of urinary retention and bladder damage during hospital care (Johansson et al., 2013). One hundred and twenty six of the remaining women were selected, matched by parity and age ( $\pm$  two years), and included to (II) a control group.

All participants were asked to void within 3 h after delivery. A bladder volume  $\geq 400$  ml after micturition, or an attempt to void, as the threshold for catheterization and definition of PUR was used in this study. Women in the experimental group received systematic ultrasound scanning for PVRBV with BladderScan™ BVI 3000® (Verathon, Seattle, USA, Allytec AB, Stockholm). The measurement was performed at least twice, and the highest volume was reported. When the ultrasound scan showed a PVRBV  $\geq 400$  ml, clean intermittent catheterization (Coloplast A/s Speedicath nr.12 and 4.0 mm) was performed, and the urine volume was measured. If the measured urine volume was  $>1000$  ml, an indwelling urinary catheter (IUC) was inserted. If the urine volume was  $\leq 1000$  ml, bladder scanning was performed within four hours of new voiding. The measurement of PVRBV was terminated when two consecutive bladder scan assessments showed PVRBV  $<200$  ml. Women in the experimental group were only catheterized if bladder scan showed a PVRBV  $\geq 400$  ml independent of clinical signs or symptoms of PUR. The women in the control group were catheterized when they were unable to void spontaneously within 3 h after delivery or had clinical signs or symptoms of PUR according to the clinical judgement of the midwife, that is, abdominal pain, abnormal bleeding, abnormal fundal height, or a palpable bladder (World Health Organisation; Fraser and Cullen, 2006p; Leach, 2011). All staff members, consisting of 60 midwives and nursing auxiliaries, were informed about the study protocol and given an introduction to the correct use of the bladder scan before data collection. To assess the inter-observer agreement for the ultrasound technique, 20 women were scanned twice a few minutes apart independent of micturition by two nurses in a blinded manner.

All collected data with date, time, and volumes were noted in a separate protocol for the study. Maternal age, newborn birth weight, parity, mode of delivery (vaginal delivery, caesarean section, or delivery with use of ventouse), use of epidural or spinal analgesia,

\*Corresponding author. E-mail: marie.blomstrand@rjl.se.

duration of first and second stages of labour and duration of active pushing during the second stage of labour were recorded. Episiotomy and complications, such as perineal tears and bleeding were also reported in this study.

Sample size calculation showed that this study needed about 100 women in each group. Statistical package for social sciences (SPSS V.22.0 software) (SPSS, Chicago, Illinois, USA) was used for statistical analyses. Continuous variables are presented as means  $\pm$  standard deviation. 95% confidence interval is given when appropriate. The Mann-Whitney U test was used to test differences among numerical variables, and the Fisher's exact test was used for binary variables. Univariable and stepwise multivariable logistic regression analyses were performed to assess the associations between obstetric characteristics and PVRBV  $\geq$ 400 ml verified by catheterization. The difference in volume measurement between bladder scanning and catheterization was analysed using single regression analysis and a Bland-Altman diagram. P-values  $\leq$ 0.05 were regarded as statistically significant. Two-sided tests were used throughout the study.

The ethical principles of respect for autonomy, non-maleficence, beneficence and justice were considered as stated in The Declaration of Helsinki. Verbal information about the study was given to each woman. The women gave their informed consent to take part in the study after verbal information. Based on the nature of the study as a quality improvement project, approval was not sought from the ethics committee. According to Swedish law of research ethics, a formal permission was not deemed necessary (Swedish Research Council, 2003).

## RESULTS

There were no differences in obstetric characteristics between the experimental group and control group (Table 1). Forty women in the experimental group and 11 in the control group were catheterized because of suspected PUR ( $p < 0.001$ ) based on bladder scanning results in the experimental group and clinical signs and symptoms in the control group. Twenty-one women in the experimental group were identified as having PUR verified by catheterization, 10 with open PUR and 11 with covert PUR. The latter group had a PVRBV of 400 to 1200 ml. Nine women in the control group were identified with PUR, and this was less than in the experimental group ( $p < 0.05$ ). No woman who gave birth by caesarean section in the experimental group or control group developed PUR. The odds of being identified with PUR among women with vaginal delivery in the experimental group were 1/4 compared to 1/11 in the control group giving an effect size of 2.7. An average of four scanning procedures (range 2 to 12) was performed per woman in the experimental group. Fourteen women with PUR in the experimental group had PVRBV  $<$ 200 ml within 6 h after delivery, and 20 had PVRBV  $<$ 200 ml within 12 h after delivery. One woman in the experimental group and one in the control group were treated with an IUC at the time of discharge from the hospital.

Univariable logistic regression analyses were performed to assess risk indicators for post-void residual volume  $\geq$ 400 ml verified by catheterization in women who delivered vaginally in the experimental group (Table 2). Seven indicators of PUR were identified. Oxytocin

infusion and perineal tears were independent risk indicators in a multivariable regression analysis. A comparison of obstetric characteristics between women with vaginal delivery and PVRBV  $\geq$ 400 ml versus PVRBV  $<$ 400 ml at catheterization in this group confirmed that women with PUR were more likely to have risk indicators than women without PUR (Table 3).

The PVRBV assessed by bladder scan was higher than the volume measured at catheterization ( $583 \pm 149$  versus  $416 \pm 331$  ml;  $p < 0.001$ ) in the experimental group (Figure 2). The ultrasound technique overestimated the volume compared with catheterization in women with bladder volumes less than 500 ml (Figure 3). However, there was only one woman with a false positive bladder scan among women with risk indicators for PUR in the experimental group. To assess the inter-observer variability, ultrasound scanning was performed twice in 20 women. There were no significant differences in estimated bladder volumes between the two observers ( $332 \pm 201$  versus  $319 \pm 192$  ml).

## DISCUSSION

To the best of this study, this is the first prospective, quasi experimental study design to compare two different regimens, systematic bladder scanning vs. assessment by clinical signs and symptoms, for the identification of women with postpartum urinary retention. The odds of identifying PUR by use of bladder scan were 2.7 times higher than diagnosis by clinical signs and symptoms in women with vaginal deliveries. No woman with a caesarean section developed PUR. Oxytocin infusion and perineal tear were strong independent risk indicators for PUR. Bladder scan overestimated the bladder volume compared to catheterization. However, only one woman with risk indicators for PUR in the experimental group had a false positive scan. All women except one with PUR in the experimental group recovered within 12 h.

Bladder scanning has been found to be a suitable method for identification of PUR, because it is non-invasive and has accurate agreement with catheterization. However, the clinical relevance of a systematic bladder scanning program in new delivered women has been considered to be ambiguous (Yip et al., 2002; Demaria et al., 2004; Van Os and Van der Linden, 2006; Lukasse et al., 2007; Buchanan and Beckmann, 2014; Mulder et al., 2014). The study identified more women with PUR using bladder scan than by analysis of clinical signs and symptoms alone. The results of this study are consistent with the study of Van Os and Van der Linden (2006). The data of this study, suggest that systematic use of ultrasound scanning appears necessary if PUR could be detected. The bladder scanning regimen was criticized by some patients and staff members who considered that too much attention was placed on bladder function instead of care for the mother, new born and breastfeeding. Is it feasible to

**Table 1.** Obstetric characteristics of the experimental group and control group.

Parameter	Experimental group n = 126	Control group n = 126
Maternal age, mean (SD), years	31 (5)	31 (5)
Birth weight, mean (SD), g	3484 (502)	3510 (581)
First pregnancy, n (%)	55 (44)	55 (44)
Spontaneously vaginal delivery, n (%)	95 (75)	101 (80)
Delivery with use of ventouse, n (%)	13 (10)	7 (6)
Acute caesarean section, n (%)	12 (10)	9 (7)
Elective caesarean section, n (%)	7 (6)	9 (7)
Oxytocin infusion, n (%)	42 (33)	48 (38)
Epidural analgesia, n (%)	38 (30)	37 (29)
Second stage of labour > 120 min, n (%)	23 (18)	21 (17)
Active pushing > 30 min, n (%)	18 (14)	20 (16)
Bleeding volume > 1000 ml, n (%)	6 (5)	7 (6)
Perineal tear 2 <sup>nd</sup> , n (%)	20 (16)	28 (22)
Perineal tear 3 <sup>rd</sup> – 4 <sup>th</sup> , n (%)	3 (2)	3 (2)
Episiotomy, n (%)	5 (4)	6 (5)

**Table 2.** Risk indicators for post-void residual bladder volume  $\geq 400$  ml verified by catheterization in women with vaginal delivery in the experimental group.

Parameter	Univariable analyses			Multivariable analyses		
	OR	95% CI	p	OR	95% CI	p
First pregnancy (n = 41)	4.4	[1.6 - 12.1]	0.005	2.4	[0.8 - 7.5]	0.120
Delivery with use of ventouse (n = 12)	5.3	[1.5 - 18.8]	0.012	-	-	-
Oxytocin infusion (n = 36)	7.7	[2.7 - 22.5]	<0.001	6.6	[2.2 - 19.8]	<0.001
Epidural analgesia (n = 34)	5.0	[1.8 - 13.8]	0.002	-	-	-
Second stage of labour >120 min (n = 21)	4.6	[1.6 - 13.3]	0.006	-	-	-
Active pushing >30 min (n = 18)	3.4	[1.1 - 10.3]	0.045	-	-	-
Perineal tear 2 <sup>nd</sup> – 4 <sup>th</sup> and/or episiotomy (n = 25)	4.3	[1.5 - 12.0]	0.008	3.3	[1.1 - 10.0]	0.036

CI = confidence intervals; OR = Odds ratio. Based on univariable logistic regression analyses and multivariable logistic regression analysis, final model.

**Table 3.** Obstetric characteristics of women with vaginal delivery and post-void residual bladder volume  $\geq 400$  ml or <400 ml in the experimental group.

Parameter	PVRBV $\geq 400$ ml [n = 21]	PVRBV <400 ml [n = 86]	p
Birth weight, mean (SD), g	3600 (413)	3532 (504)	ns
First pregnancy, n (%)	14 (67)	27 (31)	0.01
Delivery with use of ventouse, n (%)	6 (29)	6 (7)	0.05
Oxytocin infusion, n (%)	15 (71)	21 (24)	< 0.001
Epidural analgesia, n (%)	13 (62)	21 (24)	0.01
Second stage of labour > 120 min, n (%)	9 (43)	12 (14)	0.01
Active pushing > 30 min, n (%)	7 (33)	11 (13)	0.05
Perineal tear 2 <sup>nd</sup> – 4 <sup>th</sup> and/or episiotomy, n (%)	10 (48)	15 (17)	0.01
No risk indicator for PUR, n (%)	2 (9)	37 (43)	0.01

PVRBV: Post-void residual bladder volume; No of risk indicator for PUR, that is, absence of risk indicators for postpartum urinary retention presented in Table 2. The Mann-Whitney U test was used to test differences among numerical variables, and the Fisher's exact test was used for binary variables.

reduce the number bladder scan controls? While seven risk indicators for PUR were identified. Prolonged labour,

instrument-assisted delivery, epidural or regional anaesthesia and perineal lacerations has shown to be

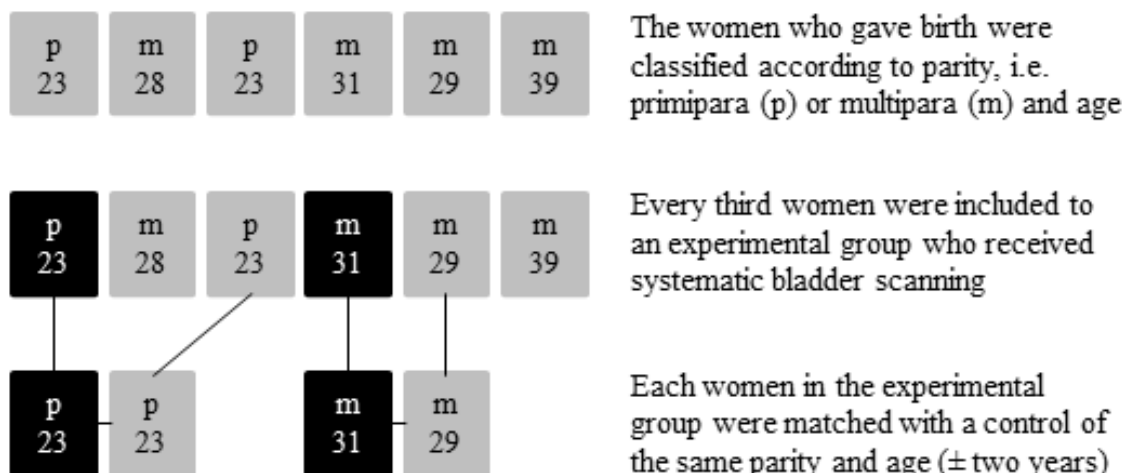


Figure 1. The patient's enrolment of the study.

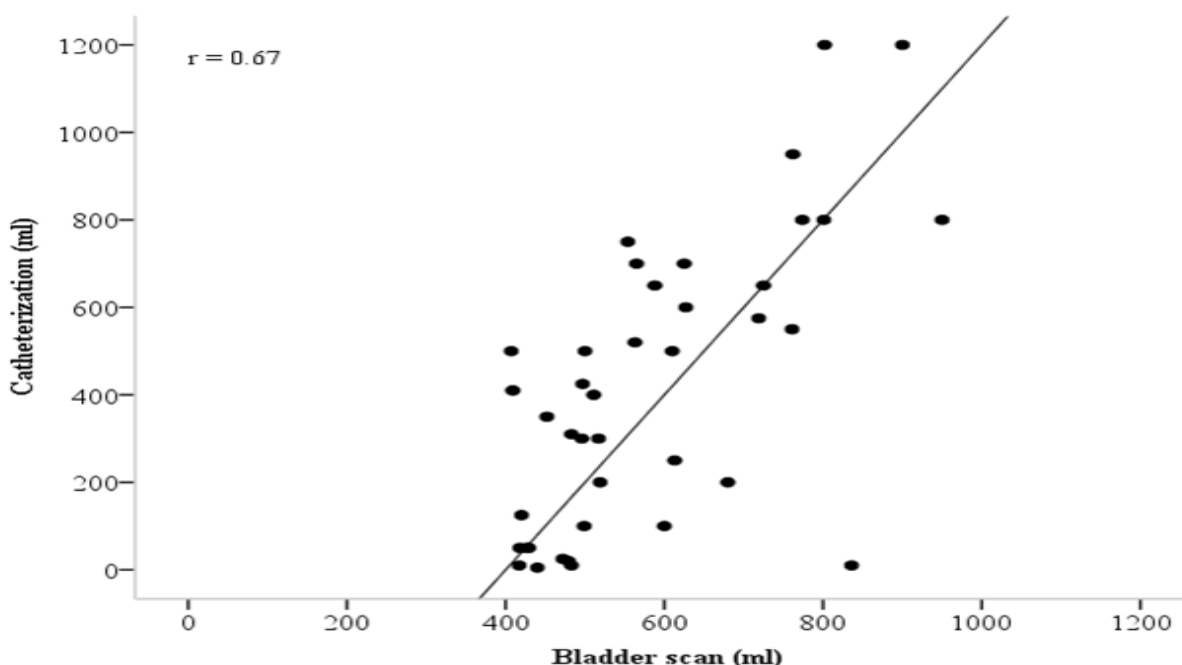
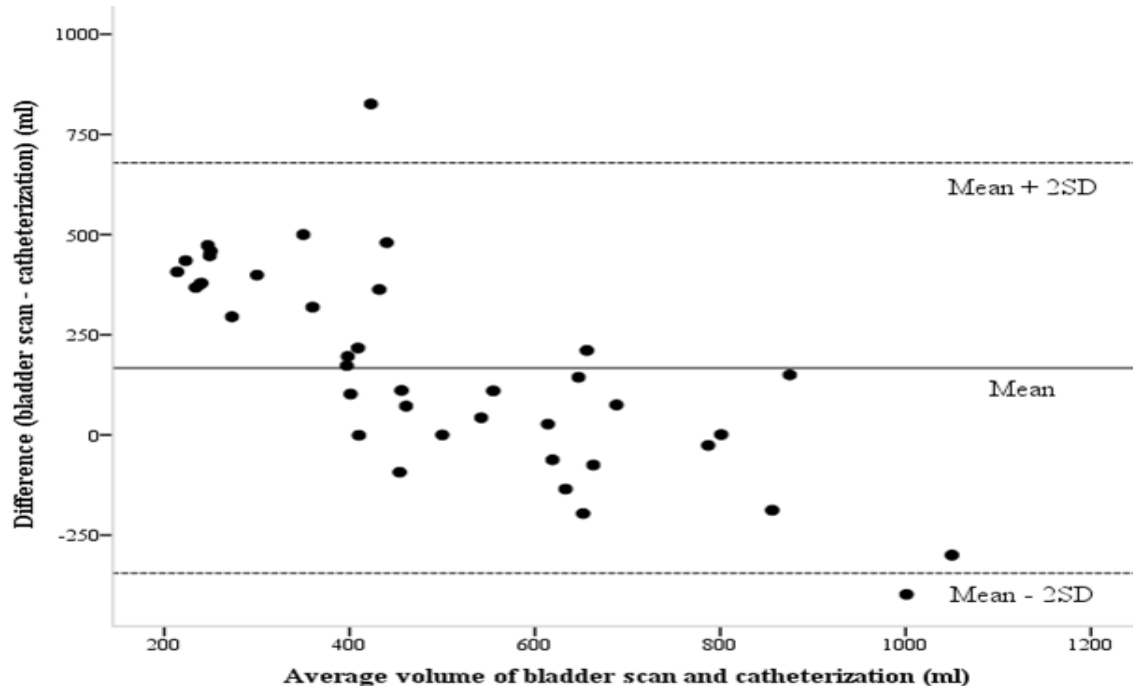


Figure 2. The relation between post-voided residual bladder volume assessed by bladder scan and catheterization in 40 women in the experimental group. The regression line and correlation coefficient are presented.

independent risk factors for PUR (Carley et al., 2002; Liang et al., 2002; Musselwhite et al., 2007; Oh et al., 2015). Oxytocin infusion and perineal tears were independent risk indicators in this study. The result differs slightly from previous studies. The reason may be due to variations in obstetric procedures, complications and, definition and management of postpartum urinary retention between the studies. However, it is not surprising that oxytocin was a risk indicator since the urine secretion may increase considerably after

completion of the infusion. The results indicate that screening for increased PVRBV by use of bladder scan in women with vaginal delivery and risk indicators for PUR is necessary.

The study had a number of false positive bladder scanning results and bladder scan estimated a higher PVRBV than catheterization, especially in women with bladder volumes less than 500 ml. These results differ from three previous studies (Demaria et al., 2004; Van Os and Van der Linden, 2006; Lukasse et al., 2007).



**Figure 3.** The differences in estimated bladder volume between bladder scan and catheterization are plotted against the average of the two (Bland-Altman plot). The upper and lower dotted lines show the limits of agreement (mean  $\pm$  2 standard deviation), and the middle line shows the mean difference.

Bladder scanning tended to underestimate bladder volumes compared to that of catheterization in the studies of Lukasse et al. (2007) and Demaria et al. (2004) but there was no differences in the estimated bladder volumes between the two methods in the studies of Van Os and Van Der Linden (2006). Differences between bladder scanning and catheterization could be due to technical problems. The uterine shape and size or blood in the uterus may be mistaken for urine in the bladder (Teng et al., 2005; Altschuler and Diaz, 2006; Saint et al., 2009). Although, bladder scanning is considered to be a reliable method for assessing PVRBV in women who recently delivered, the estimated volume may differ between bladder scanning and catheterization (Van Os and Van der Linden, 2006; Lukasse et al., 2007).

A threshold of 400 ml for catheterization was used in this study. The threshold used in the immediate postpartum period varies in the literature from 150 to 500 ml (Glavind and Bjork, 2003; Van Os and Van der Linden, 2006; Buchanan and Beckmann, 2014). A low threshold may result in unnecessary catheterizations. In addition to discomfort, there is risk of urinary tract infection. Catheterization is not the only way to treat PUR. The midwife has an important role to instruct women to void frequently and with good amounts of urine (Rogers and Leeman, 2007; Saint et al., 2009; Leach, 2011). There are some management recommendations in the literature to aid voiding. These include early administration of oral analgesic and analgesic ointment, providing privacy, and

helping the patient to stand and walk after delivery (Yip et al., 2004; Leach 2011). One study reports that 50% of women with PUR could void with these simple management procedures (Kerr-Wilson et al., 1984). Catheterization should not be performed until these methods have been attempted (Yip et al., 2004).

There are some limitations to this study. A quasi experimental design was chosen since a true randomized trial had been practically difficult to implement. There are obviously some operator errors among the bladder scanning results in this study. The staff members were trained on how to use the bladder scan before the study but the discrepancies between the bladder scanning and catheterization results were higher in this study compared to those in previous reports (Demaria et al., 2004; Van Os and Van der Linden, 2006; Lukasse et al., 2007). Training in bladder scanning techniques improves the accuracy for determining low bladder volumes (Oh-Oka and Fujisawa, 2007). The training program might have been too short but the study had on the other hand no significant inter-observer variability. The study did not catheterize all women in the experimental group and therefore, it is unclear if there were any false negative bladder scanning results. However, bladder scan tended to overestimate and not underestimate bladder volumes <500 ml compared to catheterization and therefore, it is unlikely that the study had false negative results. This study had no follow-up data for the women. This study did not know if the women who had PVRBV  $\geq$ 400 ml but

lacked clinical signs and symptoms of PUR would have had injuries if they had not been catheterized. The long-term consequences of PUR are largely unknown (Mulder et al., 2014). PUR might be a transient problem; however, evidence that it is harmful is lacking and PUR should be regarded as a serious condition due to the possible complications (Mulder et al., 2014). A regimen based on clinical signs and symptoms alone fails to detect many women with covert PUR and a more frequent and systematic use of catheterization instead of bladder scanning is a worse alternative.

## Conclusion

This prospective study shows that oxytocin infusion and perineal tears are strong risk indicators for PUR in women with vaginal delivery. The odds of identifying women with PUR are 2.7 times higher by use of bladder scan than by use of clinical signs and symptoms. It is suggested that there should be a regimen based on bladder scanning, especially in women with vaginal delivery and risk indicators, to select those who need support to void or catheterization. Further studies are needed to test the design and efficiency of such a regimen and the long-time consequence of PUR.

## Conflict of Interest

The authors have not declared any conflict of interest.

## ACKNOWLEDGEMENTS

The authors would like to thank the staff at the Department of Obstetrics and Gynecology, County Hospital Ryhov, Jönköping, Sweden for their help and assistance. Statistical assistance was provided by Mats Nilsson. The study was supported by grants from Futurum, the Academy for Health Care, Jönköping County Council, Jönköping, Sweden.

**Abbreviations:** **PUR**, Postpartum urinary retention; **PVRBV**, post-void residual bladder volume; **IUC**, indwelling urinary catheter; **Ns**, not statistically significant; **R**, correlation coefficient; **OR**, odds ratio; **CI**, confidence interval.

## REFERENCES

- Altschuler V, Diaz L (2006). Bladder ultrasound. *Medsurg. Nurs.* 15(5):317-318.
- Buchanan J, Beckmann M (2014). Postpartum voiding dysfunction: identifying the risk factors. *Aust. N. Z. J. Obstet. Gynaecol.* 54(1):41-45.
- Carley ME, Carley JM, Vasdev G, Lesnick TG, Webb MJ, Ramin KD, Lee RA (2002). Factors that are associated with clinically overt postpartum urinary retention after vaginal delivery. *Am. J. Obstet. Gynecol.* 187(2):430-433.
- Demaria F, Amar N, Biau D, Fritel X, Porcher R, Amarenco G, Madelenat P, Benifla JL (2004). Prospective 3D ultrasonographic evaluation of immediate postpartum urine retention volume in 100 women who delivered vaginally. *Int. Urogynecol. J. Pelvic Floor Dysfunct.* 15(4):281-285.
- Fraser DM, Cullen L (2006). Postnatal management and breastfeeding. *Curr. Obstet. Gynaecol.* 16:65-71.
- Glavind K, Bjork J (2003). Incidence and treatment of urinary retention postpartum. *Int. Urogynecol. J. Pelvic. Floor Dysfunct.* 14(2):119-121.
- Humburg J, Troeger C, Holzgreve W, Hoesli I (2011). Risk factors in prolonged postpartum urinary retention: An analysis of six cases. *Arch. Gynecol. Obstet.* 283(2):179-183.
- Ismail SI, Emery SJ (2008). The prevalence of silent postpartum retention of urine in a heterogeneous cohort. *J. Obstet. Gynaecol.* 28(5):504-507.
- Johansson RM, Malmvall BE, Andersson-Gare B, Larsson B, Erlandsson I, Sund-Levander M, Rensfelt G, Molstad S Christensson L (2013). Guidelines for preventing urinary retention and bladder damage during hospital care. *J. Clin. Nurs.* 22(3-4):347-355.
- Kekre AN, Vijayanand S, Dasgupta R, Kekre N (2011). Postpartum urinary retention after vaginal delivery. *Int. J. Gynaecol. Obstet.* 112(2):112-115.
- Kerr-Wilson RH, Thompson SW, Orr JW, Davis RO, Cloud GA (1984). Effect of labor on the postpartum bladder. *Obstet. Gynecol.* 64(1):115-118.
- Leach S (2011). 'Have you had a wee yet?' Postpartum urinary retention. *Pract. Midwife* 14(1):23-25.
- Liang CC, Wong SY, Tsay PT, Chang SD, Tseng LH, Wang MF, Soong YK (2002). The effect of epidural analgesia on postpartum urinary retention in women who deliver vaginally. *Int. J. Obstet. Anesth.* 11(3):164-169.
- Liang CC, Lin YH, Chen TC, Chang SD (2014). How antepartum and postpartum acute urinary retention affects the function and structure of the rat bladder. *Int. Urogynecol. J.* 25:1105-1113.
- Lukasse M, Cederkvist HR, Rosseland LA (2007). Reliability of an automatic ultrasound system for detecting postpartum urinary retention after vaginal birth. *Acta Obstet. Gynecol. Scand.* 86(10):1251-1255.
- Mulder FE, Hakvoort RA, Schoffemeer MA, Limpens J, Van der Post JA, Roovers JP (2014). Postpartum urinary retention: a systematic review of adverse effects and management. *Int. Urogynecol. J.* 25(12):1605-1612.
- Musselwhite KL, Faris P, Moore K, Berci D, King KM (2007). Use of epidural anesthesia and the risk of acute postpartum urinary retention. *Am. J. Obstet. Gynecol.* 196(5):472.e1-5.
- Oh JJ, Kim SH, Shin JS, Shin SJ (2015). Risk factors for acute postpartum urinary retention after vaginal delivery, focus on episiotomy direction. *J. Matern. Fetal Neonatal Med.* 3:1-4.
- Oh-Oka H, Fujisawa M (2007). Study of low bladder volume measurement using 3-dimensional ultrasound scanning device: improvement in measurement accuracy through training when bladder volume is 150 ml or less. *J. Urol.* 177(2):595-599.
- Rogers RG, Leeman LL (2007). Postpartum genitourinary changes. *Urol. Clin. North Am.* 34(1):13-21.
- Saint S, Olmsted RN, Fakhri MG, Kowalski CP, Watson SR, Sales AE, Krein SL (2009). Translating health care-associated urinary tract infection prevention research into practice via the bladder bundle. *Comm. J. Qual. Patient Saf.* 35(9):449-455.
- Saultz JW, Toffler WL, Shackles JY (1991). Postpartum urinary retention. *J. Am. Board. Fam. Pract.* 4(5):341-344.
- Swedish Research Council (2003). Riktlinjer för etisk värdering av medicinsk human forskning. Forskningsetisk policy och organisationer i Sverige. 3rd ed. (Guidelines for ethical assessment of medical research on human. Policy and organization of research ethics in Sweden). Stockholm (in Swedish).
- Teng CH, Huang YH, Kuo BJ, Bih LI (2005). Application of portable ultrasound scanners in the measurement of post-void residual urine. *J. Nurs. Res.* 13(3):216-224.



- Van Os AF, Van der Linden PJ (2006). Reliability of an automatic ultrasound system in the post partum period in measuring urinary retention. *Acta. Obstet. Gynecol. Scand.* 85(5):604-607.
- World Health Organisation W (1998). Safer motherhood – postpartum care of the mother and newborn: A practical guide. Geneva: World Health Organisation.
- Yip SK, Sahota D, Chang AM, Chung TK (2002). Four-year follow-up of women who were diagnosed to have postpartum urinary retention. *Am. J. Obstet. Gynecol.* 187(3):648-652.
- Yip SK, Sahota D, Pang MW, Chang A (2004). Postpartum urinary retention. *Acta. Obstet. Gynecol. Scand.* 83(10):881-891.
- Zaki MM, Pandit M, Jackson S (2004). National survey for intrapartum and postpartum bladder care: assessing the need for guidelines. *B. J. O. G.* 111(8):874-876.



# International Journal of Nursing and Midwifery

## Related Journals Published by Academic Journals

- *International Journal of Medicine and Medical Sciences*
- *Journal of Medicinal Plant Research*
- *African Journal of Pharmacy and Pharmacology*
- *Journal of Dentistry and Oral Hygiene*
- *Medical Practice and Reviews*
- *Journal of Public Health and Epidemiology*

**academicJournals**