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Pudendal Block and Urinary Dysfunction/Retention

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1. The association between specific parturition events and urinary incontinence in later life: Results from a retrospective cohort study

Author(s): Thom D.; Creasman J.; Subak L.; Brown J.; Van Den Eeden S.; Ragins A.

Source: *Neurourology and Urodynamics*; Sep 2009; vol. 28 (no. 7); p. 768-769

Publication Date: Sep 2009

Publication Type(s): Journal: Conference Abstract

Available in full text at [Neurourology and Urodynamics](#) - from John Wiley and Sons

Available in full text at [Neurourology and Urodynamics](#) - from John Wiley and Sons

Abstract: Hypothesis/Aims of study While vaginal birth is a widely recognized risk factor for urinary incontinence (UI) in later life, little is known re the association between specific parturition events and later UI. Studies have reported an association between post-partum UI and specific parturition events, such as type of anesthesia or use of forceps, though results have been inconsistent.[1-2] While most women with UI in the post-partum period regain continence, it has been suggested that specific parturition events may continue to contribute to the risk of UI in later life, as aging diminishes physiologic reserves.[3] Our study examined associations between specific parturition events and UI in middle-aged and older women. Study design, materials and methods: The Reproductive Risks for Incontinence Study at Kaiser (RRISK) is a retrospective cohort study of women between 40 and 69 years of age as of January 1, 1999 who have been members since age 18 of Kaiser Permanente Medical Care Program of Northern California, a pre-paid group practice with over 3 million members, about 25% of general population in the area served. A random sample of women was generated from membership files. Women were screened and recruited with the goal of obtaining weighted sample with equal numbers in each 5 year age strata and a distribution of 40% white, 20% Hispanic, 20% Asian and 20% African-American participants. Women were excluded if they did not speak English or Spanish, reported having had less than half of their births within Kaiser, were no longer members of Kaiser, had moved out of the area, or were demented or otherwise too impaired to participate. Eligibility could not be determined for 1326 women. Of 2817 women determined to be eligible, 2109 (74.9%) were enrolled. Questionnaires ascertained variables including age, self-reported race/ethnicity, a detailed description of current UI, medical and surgical history, pregnancy and parturition history, menopausal status, hormone replacement, health habits, general health, and demographics. Weight and height were measured by the interviewer and used to calculate body mass index (BMI) in kg/m². Labor and delivery records, archived since 1945, were abstracted by professional medical record abstractors. Current UI was defined as at least monthly incontinence for the past 12 months and was further characterized as monthly, weekly and daily. Type of incontinence was defined for those women with at least weekly incontinence, according to their response to two questions, one asking if UI occurred "with an activity like coughing, lifting, sneezing or exercise" (stress incontinence) and the other asking if UI occurred "with a physical sense of urgency" (urge incontinence). For purposes of analysis, stress incontinence was defined as the majority of UI episodes in the past 7 days being stress related; similarly urge incontinence was

defined as the majority of episodes being urge related. Women reporting no episodes of UI in the past 12 months were considered continent. Bivariate associations of parturition events and UI were assessed using logistic or proportional odds models. Variables associated with incontinence at p 10%) change in the estimated association between any racial/ethnic group and incontinence were retained in the model. Age and parity were included by default in all models. Continuous variables were also assessed as categorical variables to maximize the opportunity for detecting confounding. All analyses were carried out in SAS Version 8.02 (SAS Institute, Cary, NC). Additional, exploratory analyses were performed using recursive partitioning to search for combinations of parturition exposures that were associated with increased probability of UI. Results: Of the 2109 participating women, 1521 reported at least one vaginal birth and are included in the analysis. The mean age was 56.1 +/- 8.5 years; 46% were Caucasian, non-Hispanic, 19% were African-American, 18% were Hispanic (predominately of Mexican origin), and 16% were Asian. Exposure to specific parturition events are shown in the table for women with UI > weekly compared to continent women. All exposures, with the exception of ever having had a 3rd or 4th degree tear, were associated with UI in the bivariate (unadjusted) analysis, though the association was statistically significant only for 'ever being induced,' and 'ever having pudendal anesthesia.' In multivariate analysis, only 'ever being induced' remained significant. When analysis was restricted to comparing women with only stress UI, a similar pattern was seen in the bivariate analysis, while in the multivariate analysis, only 'ever pudendal anesthesia' remained significant (OR=1.4, 95% CI=1.0 to 2.0). (Table Presented)

Exploratory analysis using recursive partitioning found that age at first delivery > 23 years and birth weight > 3177 grams identified a subgroup of women at with a high prevalence of > weekly UI (64% vs 42% in all women). Similarly, age at first delivery > 23 years and birth weight > 3026 grams identified a subgroup of women more likely to have stress UI (41% vs. 28%). No factors of similar importance were found which identified women with a high prevalence of urge incontinence.

Interpretation of Results: Our results are consistent with the literature on parturition events and risk of post-partum incontinence in that individual several individual events were associated with an increased risk of UI, but the associations were mostly weak to moderate in magnitude and not statistically significant. In multivariate analysis, only ever having been induced remained associated with weekly UI later in life and ever having had a pudendal anesthesia remained associated with weekly stress UI, which is consistent with a prior study which reported that epidural or spinal anesthesia were protective for post-partum UI [2]. Recently, it has been reported that while parity is a significant risk factor for UI in women below about age 60, its association is weaker in women above after age 55 to 60. Unfortunately, we did not have sufficient number of subjects to investigate age as an effect modifier. Concluding message: We were not able to identify specific parturition events that clearly increased the risk of UI in later life. It remains possible that there are specific events that increase UI risk for women in a somewhat younger age group (e.g., 35 to 55), perhaps by effectively causing the UI to develop earlier then it would have otherwise. A larger study, dedicated to women in this age group, is needed to evaluate this possibility.

Database: EMBASE

2. Is Postpartum Urinary Retention a Neurogenic Phenomenon?

Author(s): Alas A.N.; Hurtado E.A.

Source: Current Bladder Dysfunction Reports; Dec 2015; vol. 10 (no. 4); p. 318-324

Publication Date: Dec 2015

Publication Type(s): Journal: Review

Available in full text at [Current Bladder Dysfunction Reports](#) - from Springer Link Journals

Abstract: Postpartum urinary retention (PUR) can be classified as covert, those with postvoid residuals higher than 150 cm³, or overt, those unable to void 6 hours after vaginal delivery or after removal of a catheter after cesarean section. There is limited data and research on the mechanism of PUR. However, it has been suggested that there is a neurological component to the development of PUR. This includes disruption of the afferent system through analgesic blockade, crush or stretch injuries to the pudendal nerve during delivery, and impairment of neurotransmitters required for proper signal transduction. However, it is likely that the causes of PUR are multifactorial, and that physiologic changes of pregnancy and trauma from childbirth play a critical role. Copyright © 2015, Springer Science+Business Media New York.

Database: EMBASE

3. Urinary incontinence and pregnancy

Author(s): Deffieux X.

Source: Journal de Gynecologie Obstetrique et Biologie de la Reproduction; Dec 2009; vol. 38 (no. 8)

Publication Date: Dec 2009

Publication Type(s): Journal: Article

Available in full text at [Journal de Gynécologie Obstétrique et Biologie de la Réproduction](#) - from Free Access Content

Abstract: The goal of the current study was to systematically review the literature concerning urinary incontinence and pregnancy, in order to develop recommendations for clinical practice. The prevalence of urinary stress incontinence and overactive bladder symptoms increase with gestational age during pregnancy (from the first to the third trimester), and decrease during the third months following delivery. Obstetrics factors (position during delivery, length of the second part of the labour, forceps, episiotomy, epidural or pudendal anaesthesia) do not modify the risk of post-partum or long term urinary incontinence. At short term follow-up, caesarean delivery is associated with a lower rate of post-partum urinary incontinence. At long term follow-up, data are lacking. Non elective caesarean section is not associated with a decrease in the rate of post-partum or long-term urinary incontinence. Elective caesarean section and systematic episiotomy are not recommended methods for the prevention of post-partum urinary incontinence (grade B), even in "high risk" women. Pelvic floor muscle therapy is the first line treatment for prenatal or post-partum urinary incontinence (grade A). © 2009 Elsevier Masson SAS. All rights reserved.

Database: EMBASE

4. Use of epidural anesthesia and the risk of acute postpartum urinary retention.

Author(s): Musselwhite, Kimberly L; Faris, Peter; Moore, Katherine; Berci, Dena; King, Kathryn M

Source: American journal of obstetrics and gynecology; May 2007; vol. 196 (no. 5); p. 472

Publication Date: May 2007

Publication Type(s): Journal Article

Abstract:OBJECTIVE We aimed to examine the relationship between the use of epidural analgesia during labor and acute postpartum urinary retention. STUDY DESIGN A retrospective cohort study was conducted using 1994 labor and postpartum health records from 3 primary care centers. RESULTS Logistic regression analysis revealed that a longer second stage of labor (odds ratio [OR] 2.62; 95% confidence interval [CI] 1.41-4.85), use of systemic narcotics (OR 1.63; 95% CI 1.04-2.57), perineal laceration (OR 1.73; 95% CI 1.02-2.91), and instrumental delivery (OR 1.86; 95% CI 1.16-2.97) predicted urinary retention. There was a trend toward association of epidural analgesia and urinary retention (OR 1.69; 95% CI 0.98-2.92). Propensity score analysis revealed that any effect of epidural analgesia was likely due to effect modification of other obstetric variables. CONCLUSION Epidural analgesia during labor may increase the risk of developing urinary retention by up to 3 times. However, this effect is mediated by other obstetric variables.

Database: Medline

5. Innervation of the pelvic floor muscles: A reappraisal for the levator ani nerve

Author(s): DeRuiter M.C.; Wallner C.; Maas C.P.; Dabhoiwala N.F.; Lamers W.H.

Source: Obstetrics and Gynecology; Sep 2006; vol. 108 (no. 3); p. 529-534

Publication Date: Sep 2006

Publication Type(s): Journal: Article

Available in print at [Patricia Bowen Library and Knowledge Service West Middlesex university Hospital](#) - from Obstetrics and Gynecology

Available in full text at [Obstetrics and Gynecology](#) - from Ovid

Abstract:OBJECTIVE: We investigated the clinical anatomy of the levator ani nerve and its topographical relationship with the pudendal nerve. METHODS: Ten female pelves were dissected and a pudendal nerve blockade was simulated. The course of the levator ani nerve and pudendal nerve was described quantitatively. The anatomical data were verified using (immuno-)histochemically stained sections of human fetal pelves. RESULTS: The levator ani nerve approaches the pelvic-floor muscles on their visceral side. Near the ischial spine, the levator ani nerve and the pudendal nerve lie above and below the levator ani muscle, respectively, at a distance of approximately 6 mm from each other. The median distance between the levator ani nerve and the point of entry of the pudendal blockade needle into the levator ani muscle was only 5 mm. CONCLUSION: The levator ani nerve and the pudendal nerve are so close at the level of the ischial spine that a transvaginal "pudendal nerve blockade" would, in all probability, block both nerves simultaneously. The clinical anatomy of the levator ani nerve is such that it is prone to damage during complicated vaginal childbirth and surgical interventions. © 2006 by The American College of Obstetricians and Gynecologists. Published by Lippincott Williams & Wilkins.

Database: EMBASE

6. Evidence for the innervation of pelvic floor muscles by the pudendal nerve

Author(s): Guaderrama N.M.; Liu J.; Nager C.W.; Pretorius D.H.; Sheean G.; Kassab G.; Mittal R.K.

Source: Obstetrics and Gynecology; Oct 2005; vol. 106 (no. 4); p. 774-781

Publication Date: Oct 2005

Publication Type(s): Journal: Article

Available in print at [Patricia Bowen Library and Knowledge Service West Middlesex university Hospital](#) - from Obstetrics and Gynecology

Available in full text at [Obstetrics and Gynecology](#) - from Ovid

Abstract:OBJECTIVE: To evaluate whether the pudendal nerve innervates the levator ani muscles by assessing the effect of pudendal nerve blockade on pelvic floor muscle function. METHODS: Eleven nulliparous women without symptoms of anal or urinary incontinence were studied before and after pudendal nerve blockade with vaginal manometry, electromyography of the external anal sphincter and puborectalis muscle, and 3-dimensional transperineal ultrasound imaging of the urogenital hiatus during rest and squeeze. RESULTS: After pudendal nerve blockade, mean vaginal resting pressures decreased from 19 +/- 10 mm Hg to 15 +/- 10 mm Hg (P < .05), and mean vaginal squeeze pressures decreased from 61 +/- 29 mm Hg to 37 +/- 24 mm Hg (P < .05). After pudendal nerve blockade, the anterior-posterior length of the urogenital hiatus increased from 51 +/- 4 mm to 55 +/- 5 mm at rest (P < .05) and increased from 47 +/- 3 mm to 52 +/- 5 mm during squeeze (P < .05). Resting and squeeze electromyography amplitude of the external anal sphincter and puborectalis muscle was markedly reduced by pudendal nerve blockade. CONCLUSION: Pudendal nerve blockade decreases vaginal pressures, increases length of urogenital hiatus, and decreases electromyography activity of the puborectalis muscle, all of which suggest that the pudendal nerve does innervate the levator ani muscle. © 2005 by The American College of Obstetricians and Gynecologists. Published by Lippincott William & Wilkins.

Database: EMBASE

7. Risk factors for development and recurrence of urinary incontinence

Author(s): Bo K.

Source: Current Opinion in Urology; 1997; vol. 7 (no. 4); p. 193-196

Publication Date: 1997

Publication Type(s): Journal: Short Survey

Abstract:Three months postpartum, risk factors for development of urinary incontinence were found to be vaginal delivery, obesity and multiparity (> 5). Caesarean section and daily antenatal pelvic floor muscle exercises appear to be protective, although not completely. In two studies the importance of pelvic floor muscle function in continence was addressed. In a case-control study of stress incontinent and healthy women, significantly thicker pelvic floor muscles were found in the healthy subjects. In another study urethral pressure parameters were all reduced following pudendal nerve blockade. A threefold prevalence of urinary stress incontinence among first degree relatives of female patients with stress urinary incontinence was demonstrated. In a review article associations between psychological and cognitive factors and sensory urgency and idiopathic detrusor instability were discussed. In another review article urinary incontinence in old age was addressed. In the elderly, urinary incontinence may be either transient or established. However, it should never be considered normal due to age. On the contrary, it seems to be treatable and often curable at all ages, even in the frail elderly.

Database: EMBASE

8. Delivery and pudendal nerve function.

Author(s): Tetzschner, T; Sørensen, M; Jønsson, L; Lose, G; Christiansen, J

Source: Acta obstetricia et gynecologica Scandinavica; Apr 1997; vol. 76 (no. 4); p. 324-331

Publication Date: Apr 1997

Publication Type(s): Journal Article

Available in full text at [Acta Obstetricia et Gynecologica Scandinavica](#) - from John Wiley and Sons

Abstract:OBJECTIVE To assess the impact of mode of delivery and the occurrence of pelvic instability upon the pudendal nerve function and relate the pudendal nerve function to the occurrence of anal and urinary incontinence.METHODS One hundred and forty-six pregnant women were examined during pregnancy and 12 weeks post partum with measurement of pudendal nerve terminal motor latency (PNTML), the difference between the two measurements was defined as delta PNTML. Anal and urinary continence status, details of delivery and the occurrence of pelvic instability were recorded prospectively.RESULTS Pudendal nerve terminal motor latency increased from 1.7 msec in primiparae and 1.8 msec in multiparae during pregnancy to 2.0 msec (p 2.4 msec. The delta PNTML was significantly associated with age, the occurrence of pelvic instability and the use of vacuum extraction. The group of women with urinary incontinence had a significant increased PNTML.

Database: Medline

9. Pudendal nerve damage increases the risk of fecal incontinence in women with anal sphincter rupture after childbirth

Author(s): Tetzschner J.; Sorensen M.; Rasmussen O.O.; Lose G.; Christiansen J.

Source: Acta Obstetricia et Gynecologica Scandinavica; 1995; vol. 74 (no. 6); p. 434-440

Publication Date: 1995

Publication Type(s): Journal: Article

Abstract:Aim. To evaluate anal function after childbirth in 94 women in whom sphincter rupture occurred and in 19 control women. The findings of anorectal physiological assessment and history of childbirth were related to the presence of fecal incontinence. Methods. Anal manometry and electromyography were performed the first days after childbirth and repeated 3 months post partum together with measurement of pudendal nerve terminal motor latency. Results. Eighteen patients (19%) presented with incontinence. None of the controls developed fecal incontinence after delivery. Anal manometry showed that both incontinent and continent patients had decreased resting and squeeze pressures compared to control subjects (p2.0 milliseconds had an increased risk of having fecal incontinence compared to patients with pudendal nerve terminal motor latencies <2.0 milliseconds (odds ratio 2.18, p<0.05). Fecal incontinence could not be related to the weight or head circumference of the infant. The manometric and electromyographic findings, the use of pudendal nerve block, the length of the second stage of labor, the depth of rupture or the use of vacuumextraction could not be related to either fecal incontinence or pudendal nerve function. Conclusion. The manometric findings indicated damage to the anal sphincter apparatus in both continent and incontinent patients. Decreased pudendal nerve function characterized incontinent women. Accurate prediction of fecal incontinence in women with obstetric anal sphincter rupture is not possible.

Database: EMBASE

10. The effect of bilateral pudendal blockade on the adjunctive urethral closure forces in healthy females

Author(s): Thind P.; Lose G.

Source: Scandinavian Journal of Urology and Nephrology; 1994; vol. 28 (no. 3); p. 249-255

Publication Date: 1994

Publication Type(s): Journal: Article

Abstract:The effect of bilateral pudendal blockade on the urethral pressure and power generation during coughing and pelvic floor squeezing was evaluated in 10 healthy women. The measurements were carried out at the bladder neck, in the high pressure zone, and distally in the urethra before and after blockade. Strong adjunctive closure forces were demonstrated all along the urethra. They were significantly reduced by pudendal blockade except at the bladder neck during coughing. The results indicate that the pudendal innervated striated muscles contribute significantly to the adjunctively acting closure forces all along the female urethra, including the bladder neck. Some passive pressure transmission to the bladder neck seems to take place during stress episodes following pudendal blockade, but whether it occurs in healthy females remain uncertain. The findings following pudendal blockade corroborate with those in stress incontinent women, and thereby support the concept that striated muscle weakness is of pathophysiological significance in stress urinary incontinence.

Database: EMBASE

11. Neurophysiology of the female pelvic floor.

Author(s): Benson JT

Source: Current Opinion in Obstetrics & Gynecology; Aug 1994; vol. 6 (no. 4); p. 320-323

Publication Date: Aug 1994

Publication Type(s): Academic Journal

Abstract:The neurogenic theory of female pelvic floor dysfunction suggests a common thread for malfunction of pelvic visceral and support activities. Support for the neurogenic hypothesis has been promoted by recent literature showing that more central neuropathic processes, such as in the cauda equina or pelvic plexus, can be associated with the previously described peripheral neuropathies and are linked to pelvic floor disorders. Damage by vaginal dissection has been suggested as another etiologic factor. This concept has further been supported by studying the effects of pudendal nerve blockade. Methods for investigating pelvic floor neurophysiology are becoming more refined and widespread, and therapeutic horizons are described including nerve stimulation and surgical therapy of nerve compression.

Database: CINAHL

12. Incidence and cause of postpartum urinary stress incontinence

Author(s): Dimpfl T.; Hesse U.; Schussler B.

Source: European Journal of Obstetrics Gynecology and Reproductive Biology; 1992; vol. 43 (no. 1); p. 29-33

Publication Date: 1992

Publication Type(s): Journal: Article

Abstract:Urinary leakage was reported in 53.5% of our patients at least once during pregnancy. Multigravidae and women older than 30 were affected more often than primigravidae or women younger than 30. 6.2% of all women, who were continent before pregnancy, developed permanent stress incontinence after vaginal delivery. As a conclusion, it can be said, that vaginal delivery itself predisposes for permanent stress urinary incontinence (SUI). Factors, which increase the trauma to the pelvic floor (tear, no episiotomy, forceps or vacuum extraction), show a higher incidence of postpartum persisting SUI without statistic significance. Labour management with epidural anaesthesia showed a statistically proven lower incidence of postpartum persisting SUI in comparison to the pudendal block.

Database: EMBASE

13. Saddle block with pethidine for perineal operations.

Author(s): Acalovschi, I; Ene, V; Lörinczi, E; Nicolaus, F

Source: British journal of anaesthesia; Sep 1986; vol. 58 (no. 9); p. 1012-1016

Publication Date: Sep 1986

Publication Type(s): Comparative Study Journal Article

Abstract:Saddle blockade with pethidine hydrochloride was performed in 111 patients undergoing short surgical operations on the perineum. A dose of 5% pethidine 0.5 mg kg⁻¹ was injected to the subarachnoid space at L4-5 or L5-S1 with the patient in the sitting position. Sensory blockade was achieved in 5.28 +/- 1.43 min. This extended to the sacrococcygeal area, perineum, buttocks and posterior surface of thighs, and was followed 1-2 min later by motor blockade. During the operation the patients were stable haemodynamically and no respiratory depression was recorded. Sensory blockade lasted for 141 +/- 26.06 min and was followed by postoperative analgesia, the mean duration of which was 301 +/- 98.38 min. Postoperative neurological complications were recorded in three patients (2.7%): headache alone in one, headache associated with backache in one, and leg weakness, backache, nuchal rigidity and photophobia in another. Seven patients (6.3%) complained of itching, five patients (4.5%) of nausea and vomiting and two (1.8%) developed urinary retention.

Database: Medline

14. Postpartum complications of forceps delivery performed under epidural and pudendal nerve block.

Author(s): Moir, D D; Davidson, S

Source: British journal of anaesthesia; Nov 1972; vol. 44 (no. 11); p. 1197-1199

Publication Date: Nov 1972

Publication Type(s): Journal Article

Database: Medline

Strategy 162930

#	Database	Search term	Results
1	Medline	(pudendal ADJ3 block*).ti,ab	319
2	Medline	exp "PERONEAL NERVE"/	4116
3	Medline	exp "NERVE BLOCK"/	18753
4	Medline	(2 AND 3)	90
5	Medline	(1 OR 4)	409
6	Medline	exp "URINARY RETENTION"/	3961
7	Medline	(urin* ADJ3 retention).ti,ab	9035
8	Medline	exp "URINARY BLADDER DISEASES"/	91450
9	Medline	(bladder ADJ3 dysfunct*).ti,ab	4418
10	Medline	(6 OR 7 OR 8 OR 9)	102910
11	Medline	(5 AND 10)	19
12	Medline	(labour OR labor).ti,ab	84543
13	Medline	(5 AND 12)	48
14	Medline	(pudendal ADJ3 anaesthes*).ti,ab	14
15	Medline	(pudendal ADJ3 anesthes*).ti,ab	78
16	Medline	(14 OR 15)	90
17	Medline	(10 AND 12 AND 16)	0
18	Medline	(12 AND 16)	18
19	Medline	exp "URINARY INCONTINENCE"/	29158

20	Medline	(5 AND 19)	11
21	Medline	(16 AND 19)	5
22	Medline	exp "PELVIC FLOOR DISORDERS"/	435
23	Medline	(5 AND 22)	0
24	Medline	(16 AND 22)	0
25	EMBASE	(puden* ADJ3 block*).ti,ab	394
26	EMBASE	exp "PERONEAL NERVE"/	6632
27	EMBASE	exp "NERVE BLOCK"/	34060
28	EMBASE	(26 AND 27)	405
29	EMBASE	(puden* ADJ3 anaesthes*).ti,ab	16
30	EMBASE	(puden* ADJ3 anesthes*).ti,ab	66
31	EMBASE	(25 OR 28 OR 29 OR 30)	834
32	EMBASE	(puden* ADJ3 anesthes*).ti,ab	66
33	EMBASE	exp "BLADDER DYSFUNCTION"/	6362
34	EMBASE	exp "URINE RETENTION"/	23403
35	EMBASE	(32 OR 33 OR 34)	29369
36	EMBASE	(31 AND 35)	81
37	EMBASE	exp "URINE INCONTINENCE"/	67328
38	EMBASE	(31 AND 37)	27
39	EMBASE	exp "PELVIS FLOOR"/	11347
40	EMBASE	(28 AND 39)	0

41	EMBASE	(31 AND 39)	23
42	EMBASE	(pudendal).ti,ab	3971
43	EMBASE	exp LABOR/	36441
44	EMBASE	(33 OR 34 OR 37)	91474
45	EMBASE	(42 AND 43 AND 44)	3
46	EMBASE	exp "OBSTETRIC ANESTHESIA"/	13423
47	EMBASE	(42 AND 44 AND 46)	0
48	EMBASE	(42 AND 46)	103
49	EMBASE	(26 AND 35 AND 46)	0
50	EMBASE	(33 OR 34)	29334
51	EMBASE	(26 AND 46 AND 50)	0
52	EMBASE	(pudendal).ti,ab	3973
53	EMBASE	(50 AND 52)	149
54	EMBASE	(46 AND 53)	0
55	EMBASE	(43 AND 53)	1
56	EMBASE	(27 AND 50 AND 52)	10
57	EMBASE	exp "NERVE INJURY"/	63122
58	EMBASE	(27 AND 50 AND 57)	29
59	CINAHL	(pudendal ADJ3 block*).ti,ab	29
60	CINAHL	(pudendal ADJ3 anaesthes*).ti,ab	0
61	CINAHL	(pudendal ADJ3 anesthes*).ti,ab	1

62	CINAHL	exp "NERVE BLOCK"/	3753
63	CINAHL	(pudental).ti,ab	116
64	CINAHL	(62 AND 63)	22
65	CINAHL	(59 OR 61 OR 64)	33
66	EMBASE	(31 AND 39 AND 46)	1
67	EMBASE	exp "BLADDER INJURY"/	4171
68	EMBASE	(31 AND 67)	0
69	EMBASE	exp "URINARY TRACT INJURY"/	47268
70	EMBASE	(31 AND 69)	0
71	EMBASE	(pudental ADJ3 bladder).ti,ab	67
72	EMBASE	exp "PELVIC FLOOR DISORDER"/	1450
73	EMBASE	(31 AND 72)	2
74	EMBASE	exp "BLADDER DISEASE"/	155744
75	EMBASE	(31 AND 74)	41
76	Medline	exp "URINARY BLADDER DISEASES"/	91465
77	Medline	(5 OR 16)	444
78	Medline	(76 AND 77)	11
79	EMBASE	(43 AND 52 AND 57)	4
80	EMBASE	exp CHILDBIRTH/	57174
81	EMBASE	(31 AND 80)	69
82	Medline	exp "DELIVERY, OBSTETRIC"/	69689

83	Medline	(77 AND 82)	33
84	EMBASE	(saddle ADJ2 block*).ti,ab	110
85	EMBASE	(37 AND 84)	1
86	EMBASE	(34 AND 84)	7
87	EMBASE	(46 AND 84)	21
88	EMBASE	(80 AND 84)	7
89	EMBASE	(74 AND 84)	3
90	EMBASE	(72 AND 84)	0
91	Medline	(saddle ADJ2 block*).ti,ab	114
92	Medline	(82 AND 91)	12
93	Medline	(19 AND 91)	0
94	Medline	(10 AND 91)	5
95	EMBASE	(35 AND 84)	12
96	Medline	(voiding).ti,ab	14075
97	Medline	(5 AND 96)	12
98	Medline	(16 AND 96)	1
99	EMBASE	exp MICTURITION/	23001
100	EMBASE	(31 AND 99)	25
101	EMBASE	(25 AND 99)	23
102	EMBASE	(27 AND 34)	522
103	EMBASE	(26 AND 102)	6