Appendix

Supplementary Table A . Alternative terms for neurogenic overactive bladder considered in the literature searches

Bladder dysfunction

Bladder problems

Bladder symptoms

Detrusor areflexia

Detrusor disorder

Detrusor hyperreflexia (± impaired contractility)

Detrusor motor overactivity (± external detrusor–sphincter dyssynergia)

Detrusor overactivity

Frequency

Genitourinary complications

Incontinence

Loss of bladder control

Neurogenic bladder

Neurogenic bladder disease

Neurogenic bladder dysfunction

Neurogenic detrusor overactivity

Neurogenic lower urinary tract dysfunction

Neurogenic vesicourethral dysfunction

Overactive bladder

Overactive bladder symptoms of neurogenic origin

Overactive bladder with neurological condition

Urge frequency syndrome

Urinary incontinence with neurological condition

Urge syndrome

Urgency

Urodynamic abnormalities

Voiding dysfunction

Supplementary Table B. Covariates used in stratified analysis

Covariate	Subgroup
Year of publication	Before 2000
	2000 onwards
Geographical location	Europe
	North America
	Rest of the world
Sample size	/ D U J H •
	Medium (100–249)
	Small (<100)
Sample size regrouped	/ D U J H U •
	Smaller (<100)
Type of assessment	Clinical
	Questionnaire
	Records
Urinary symptoms at inclusion	No
	Yes
Type of study	Case-control study
	Case series
	Cohort study
	Cross-sectional study

Supplementary Table C. Details of final selection of articles reporting rates of UI

Study	Location	Study type	Assessment type	Urinary symptoms at inclusion	Patients assessed	Patients with UI	Rate	95% CI[1]
Multiple sclerosis								
Barbalias et al. 1998 [54]	Greece	Cross-sectional	Clinical	No	90	37	41.1%	30.8–52.0%
Bradley et al. 1973 [19]	USA	Cross-sectional	Clinical	Yes	99	60	60.6%	50.3–70.3%
Forbes et al. 2006 [83]	UK	Cross-sectional	Questionnaire	No	905	686	75.8%	72.9–78.6%
Gallien et al. 1998 [55]	France	Cross-sectional	Records	Yes	149	103	69.1%	61.0–76.4%
Goldstein et al. 1982 [56]	USA	Cross-sectional	Clinical	Yes	86	41	47.7%	36.8–58.7%
Gonor et al. 1985 [57]	Canada	Cross-sectional	Clinical	Yes	64	36	56.3%	43.3–68.6%
Hennessey et al. 1999 [58]	UK	Cross-sectional	Questionnaire	No	191	110	57.6%	50.2–64.7%
Koldewijn et al. 1995 [59]	Netherlands	Cross-sectional	Clinical	No	212	55	25.9%	20.2–32.4%
Nair et al. 2005 [60]	India	Cohort study	Clinical	No	13	8	61.5%	31.6–86.1%

Onal et al. 2009 [61]	Turkey	Case series	Records	No	198	160	80.8%	74.6–86.0%
Patti et al. 1997 [20]	Italy	Cross-sectional	Clinical	No	101	7	6.9%	2.8–13.8%
Pohar et al. 2007 [84]	Canada	Case-control study	Questionnaire	No	335	96	28.7%	23.9–33.8%
Porru et al. 1997 [62]	Italy	Cross-sectional	Clinical	No	120	59	49.2%	39.9–58.4%
Thomas et al. 1998 [63]	UK	Cross-sectional	Questionnaire	No	142	76	53.5%	45.0–61.9%
Spinal cord injury								
Blanes et al. 2009 [25]	Brazil	Cross-sectional	Questionnaire	No	60	53	88.3%	77.4–95.2%
Gomes et al. 2005 [64]	Brazil	Case series	Questionnaire	Yes	26	14	53.8%	33.4–73.4%
Hansen et al. 2010 [65]	Denmark	Cohort study	Questionnaire	No	221	95	43.0%	36.4–49.8%
Vogel et al. 2002 [66]	USA	Cohort study	Questionnaire	No	212	52	24.5%	18.9–30.9%
Parkinson’s disease								
Hattori et al. 1992 [67]	Japan	Cross-sectional	Clinical	No	110	31	28.2%	20.0–37.6%
Hely et al. 2005 [68]	Australia	Cohort study	Clinical	No	52	22	42.3%	28.7–56.8%

Hely et al. 2008 [69]	Australia	Cohort study	Clinical	No	30	22	73.3%	54.1–87.7%
Pohar et al. 2009 [70]	Canada	Case-control study	Questionnaire	No	261	29	11.1%	7.6–15.6%
Singer et al. 1992 [71]	USA	Case-control study	Questionnaire	No	48	6	12.5%	4.7–25.2%
Verbaan et al. 2007 [72]	Netherlands	Case-control study	Questionnaire	No	420	214	51.0%	46.1–55.8%
Wullner et al. 2007 [73]	Germany	Cross-sectional	Records	No	3214	707	22.0%	20.6–23.5%
Stroke								
Addington-Hall et al. 1995 [74]	UK	Case series	Questionnaire	No	237	121	51.1%	44.5–57.6%
Barer 1989 [75]	UK	Cohort study	Records	No	259	36	13.9%	9.9–18.7%
Brittain et al. 2000 [49]	UK	Case-control study	Questionnaire	No	382	127	33.2%	28.5–38.2%
Brittain et al. 2006 [76]	UK	Case-control study	Questionnaire	No	1342	339	25.3%	23.0–27.7%

Brocklehurst et al.1985 [33]	UK	Cohort study	Clinical	No	28	4	14.3%	4.0–32.7%
Edwards et al. 2006 [50]	USA	Case series	Questionnaire	No	361	59	16.3%	12.7–20.6%
Feder et al. 1996 [77]	Israel	Cohort study	Clinical	No	88	14	15.9%	9.0–25.2%
Jørgensen et al. 2005 [51]	Norway	Case-control study	Questionnaire	No	213	36	16.9%	12.1–22.6%
Kolominsky-Rabas et al. 2003 [78]	Germany	Cohort study	Questionnaire	No	407	130	31.9%	27.4–36.7%
Motola et al. 1988 [79]	USA	Cross-sectional	Clinical	No	30	15	50.0%	31.3–68.7%
Nakayama et al. 1997 [52]	Denmark	Cohort study	Questionnaire	No	493	94	19.1%	15.7–22.8%
Patel et al. 2007 [81]	UK	Cohort study	Questionnaire	No	150	23	15.3%	10.0–22.1%
Patel et al. 2001 [80]	UK	Cohort study	Questionnaire	No	123	12	9.8%	5.1–16.4%
Van de Port et al. 2006 [82]	Netherlands	Cohort study	Questionnaire	No	217	61	28.1%	22.2–34.6%

UI = urinary incontinence; CI = confidence interval. [1] The CIs were calculated independently for this review and were not reported in the original articles cited.

Supplementary Table D. Details of final selection of articles reporting rates of DO

Study	Location	Study type	Assessment type	Urinary symptoms at inclusion	Patients assessed	Patients with DO	Rate	95% CI
Andersen and Bradley 1976 [83]	USA	Cross-sectional	Clinical	No	52	33	63.5%	49.0–76.4%
Araki et al. 2003 [21]	Japan	Cross-sectional	Clinical	No	32	14	43.8%	26.4–62.3%
Awad et al. 1984 [84]	Canada	Cross-sectional	Clinical	No	57	38	66.7%	52.9–78.6%
Barbalias et al. 1998 [54]	Greece	Cross-sectional	Clinical	No	90	52	57.8%	46.9–68.1%
Betts et al. 1993 [9]	UK	Cross-sectional	Clinical	Yes	70	63	90.0%	80.5–95.9%
Bradley et al. 1973 [19]	USA	Cross-sectional	Clinical	Yes	99	59	59.6%	49.3–69.3%
Bradley 1978 [85]	USA	Cross-sectional	Clinical	No	302	187	61.9%	56.2–67.4%
Gallien et al. 1998 [55]	France	Cross-sectional	Clinical	Yes	149	61	40.9%	33.0–49.3%
Giannantoni et al. 1999 [86]	Italy	Cross-sectional	Clinical	Yes	116	94	81.0%	72.7–87.7%
Goldstein et al. 1982	USA	Cross-sectional	Clinical	Yes	86	65	75.6%	65.1–84.2%

[56]								
Gonor et al. 1985 [57]	Canada	Cross-sectional	Clinical	Yes	64	50	78.1%	66.0–87.5%
Khan et al. 2009 [87]	Australia	Cross-sectional	Records	No	73	43	58.9%	46.8–70.3%
Kim et al. 1998 [88]	USA	Case series	Clinical	Yes	90	46	51.1%	40.3–61.8%
Koldewijn et al. 1995 [59]	Netherlands	Cross-sectional	Clinical	No	212	72	34.0%	27.6–40.8%
Lemack et al. 2007 [89]	USA	Cross-sectional	Clinical	Yes	108	62	57.4%	47.5–66.9%
Mayo and Chetner 1992 [90]	USA	Cross-sectional	Clinical	Yes	89	69	77.5%	67.4–85.7%
Nakipoglu et al. 2009 [91]	Turkey	Cross-sectional	Clinical	No	52	14	26.9%	15.6–41.0%
Onal et al. 2009 [61]	Turkey	Case series	Clinical	No	75	26	34.7%	24.0–46.5%
Patti et al. 1997 [20]	Italy	Cross-sectional	Clinical	No	75	33	44.0%	32.5–55.9%
Petersen and Pedersen 1984 [92]	Denmark	Cross-sectional	Clinical	Yes	88	73	83.0%	73.4–90.1%
Porru et al. 1997 [62]	Italy	Cross-sectional	Clinical	No	120	52	43.3%	34.3–52.7%
Sirls et al. 1994 [23]	USA	Case series	Clinical	No	113	79	69.9%	60.6–78.2%
Van Poppel et al. 1983 [93]	Belgium	Cross-sectional	Clinical	No	160	106	66.3%	58.4–73.5%
Ventimiglia et al. 1998	Italy	Cross-sectional	Clinical	No	236	69	29.2%	23.5–35.5%

[22]								
Wheeler Jr. et al. 1983 [94]	USA	Cohort study	Clinical	Yes	18	10	55.6%	30.8–78.5%
Beric and Light 1992 [95]	USA	Cohort study	Clinical	Yes	17	13	76.5%	50.1–93.2%
Chen et al. 2009 [96]	China	Case series	Clinical	No	134	43	32.1%	24.3–40.7%
Ehren et al. 1994 [97]	Sweden	Cohort study	Clinical	No	38	26	68.4%	51.3–82.5%
Gupta et al. 2009 [4]	India	Case series	Clinical	No	52	43	82.7%	69.7–91.8%
Morita et al. 1994 [98]	Japan	Case series	Clinical	No	76	52	68.4%	56.7–78.6%
Patki et al. 2006 (a) [99]	UK	Case series	Clinical	No	10	6	60.0%	26.2–87.8%
Patki et al. 2006 (b) [100]	UK	Case series	Clinical	No	64	25	39.1%	27.1–52.1%
Sacomani et al. 2003	Brazil	Case series	Clinical	No	71	8	11.3%	5.0–21.0%
Suzuki and Ushiyama 2001[101]	Japan	Case-control study	Clinical	No	103	36	35.0%	25.8–45.0%
Tosi et al. 1993 [102]	Italy	Cross-sectional	Clinical	No	35	28	80.0%	63.1–91.6%
Van Kerrbroeck et al. 1993 [103]	Netherlands	Cohort study	Clinical	No	93	66	71.0%	60.6–79.9%

Ventimiglia et al. 1998 [22]	Italy	Cross-sectional	Clinical	No	166	40	24.1%	17.8–31.3%
Watanabe et al. 1998 [104]	USA and Japan	Cross-sectional	Clinical	No	44	8	18.2%	8.2–32.7%
Weld and Dmochowski 2000 [44]	USA	Case series	Clinical	No	243	99	40.7%	34.5–47.2%
Andersen and Bradley 1976 [83]	USA	Cross-sectional	Clinical	Yes	24	15	62.5 %	40.6–81.2%
Araki et al. 2000 [105]	Japan	Cross-sectional	Clinical	Yes	70	47	67.1 %	54.9–77.9%
Berger et al. 1987 [8]	USA	Cross-sectional	Clinical	Yes	29	26	89.7 %	72.6–97.8%
Hattori et al. 1992 [67]	Japan	Cross-sectional	Clinical	No	39	19	48.7 %	32.4–65.2%
Pavlakis et al. 1983 [32]	USA	Cross-sectional	Clinical	Yes	30	28	93.3 %	77.9–99.2%
Ransmayr et al. 2008 [106]	Austria	Cross-sectional	Clinical	Yes	15	6	40.0 %	16.3–67.7%
Sakakibara et al. 2001[107]	Japan	Case-control study	Questionnaire	No	21	17	81.0 %	58.1–94.6%
Stocchi et al. 1997	Italy	Cross-sectional	Clinical	No	30	11	36.7	19.9–56.1%

[108]							%	
Ventimiglia et al. 1998 [22]	Italy	Cross-sectional	Clinical	No	52	4	7.7%	2.1–18.5%
Han et al. 2010 [109]	Korea	Case series	Clinical	Yes	84	50	59.5%	48.3–70.1%
Khan et al. 1990 [110]	USA	Case series	Clinical	Yes	33	26	78.8%	61.1–91.0%
Kim et al. 2010 [111]	Korea	Case series	Clinical	Yes	69	44	63.8%	51.3–75.0%
Motola et al. 1988 [79]	USA	Cross-sectional	Clinical	No	30	13	43.3%	25.5–62.6%
Motola and Badlani 1990 [112]	USA	Case series	Clinical	No	44	20	45.5%	30.4–61.2%
Nitti et al. 1996 [113]	USA	Cross-sectional	Clinical	Yes	38	31	81.6%	65.7–92.3%
Tsuchida et al. 1983 [114]	Japan	Cross-sectional	Clinical	No	39	30	76.9%	60.7–88.9%

DO = detrusor overactivity; CI = confidence interval.

Supplementary Table E. Results of the meta-analyses of the studies reporting rates of urinary incontinence in patients with multiple sclerosis

Study	No. of patients	Rate	95% CI	Weights (%): random-effect meta-analysis
Barbalias et al. 1998 [54]	37	0.411	0.308–0.520	7.13
Bradley et al. 1973 [19]	60	0.606	0.503–0.703	7.16
Forbes et al. 2006 [83]	686	0.758	0.729–0.786	7.41
Gallien et al. 1998 [55]	103	0.691	0.61–0.764	7.27
Goldstein et al. 1982 [56]	41	0.477	0.368–0.587	7.11
Gonor et al. 1985 [57]	36	0.563	0.433–0.686	7.01
Hennessey et al. 1999 [58]	110	0.576	0.502–0.647	7.29
Koldewijn et al. 1995 [59]	55	0.259	0.202–0.324	7.33
Nair et al. 2005 [60]	8	0.615	0.316–0.861	5.82
Onal et al. 2009 [61]	160	0.808	0.746–0.860	7.34
Patti et al. 1997 [20]	7	0.069	0.028–0.138	7.35
Pohar et al. 2007 [84]	96	0.287	0.239–0.338	7.36
Porru et al. 1997 [62]	59	0.492	0.399–0.584	7.2
Thomas et al. 1988 [63]	76	0.535	0.450–0.619	7.23
Pooled rate (95% CI)				**0.509 (0.367–0.650)**
Heterogeneity				**I^2 = 98.4%** **Chi-square p < 0.001**

CI = confidence interval.

Supplementary Table F. Results of the meta-analyses of the studies reporting rates of urinary incontinence in patients with spinal cord injury

Study	No. of patients	Rate	95% CI	Weights (%): random-effect meta-analysis
Blanes et al. 2009 [25]	60	0.883	0.774–0.952	25.4
Gomes et al. 2005 [64]	26	0.538	0.334–0.734	23.1
Hansen et al. 2010 [65]	221	0.430	0.364–0.498	25.7
Vogel et al. 2002 [66]	212	0.245	0.189–0.309	25.8
Pooled rate (95% CI)				**0.523 (0.238–0.807)**
Heterogeneity				**I^2 = 97.8%** **Chi-square p < 0.001**

CI = confidence interval.

Supplementary Table G. Results of the meta-analyses of the studies reporting rates of urinary incontinence in patients with Parkinson's disease

Study	No. of patients	Rate	95% CI	Weights (%): random-effect meta-analysis
Hattori et al. 1992 [67]	110	0.282	0.200–0.376	14.5
Hely et al. 2005 [68]	52	0.423	0.287–0.568	12.9
Hely et al. 2008 [69]	30	0.733	0.541–0.877	11.9
Pohar et al. 2009 [70]	261	0.111	0.076–0.156	15.5
Singer et al. 1992 [71]	48	0.125	0.047–0.252	14.1
Verbaan et al. 2007 [72]	420	0.510	0.461–0.558	15.4
Wullner et al. 2007 [73]	3214	0.220	0.206–0.235	15.7
Pooled rate (95% CI)				**0.331 (0.213–0.448)**
Heterogeneity				**I^2 = 97.1%** **Chi-square p < 0.001**

CI = confidence interval.

Supplementary Table H. Results of the meta-analyses of the studies reporting rates of urinary incontinence in patients with stroke

Study	No. of patients	Rate	95% CI	Weights (%): random-effect meta-analysis
Addington-Hall et al. 1995 [74]	237	0.511	0.445–0.576	7.3
Barer et al. 1989 [75]	259	0.139	0.099–0.187	7.8
Brittain et al. 2000 [49]	382	0.332	0.285–0.382	7.7
Brittain et al. 2006 [76]	1342	0.253	0.23–0.277	8.1
Brocklehurst et al. 1985 [33]	28	0.143	0.04–0.327	5.0
Edwards et al. 2006 [50]	361	0.163	0.127–0.206	7.9
Feder et al. 1996 [77]	88	0.159	0.09–0.252	6.8
Jørgensen et al. 2005 [51]	213	0.169	0.121–0.226	7.6
Kolominsky-Rabas et al. 2003 [78]	407	0.319	0.274–0.367	7.7
Motola J et al. 1988 [83]	30	0.500	0.313–0.687	3.9
Nakayama et al. 1997 [52]	493	0.191	0.157–0.228	7.9
Patel et al. 2001 [80]	150	0.098	0.051–0.164	7.5
Patel et al. 2007 [81]	123	0.153	0.1–0.221	7.4
Van de Port et al. 2006 [82]	217	0.281	0.222–0.346	7.4
Pooled rate (95% CI)				**0.236 (0.185–0.288)**
Heterogeneity				**I^2 = 93.0%** **Chi-square p < 0.001**

CI = confidence interval.

Supplementary Table *I*. Results of the meta-analyses of the studies reporting rates of detrusor overactivity in patients with multiple sclerosis

Study	No. of patients	Rate	95% CI	Weights (%): random-effect meta-analysis
Andersen et al. 1976 [83]	52	0.635	0.49–0.764	3.8
Araki et al. 2003 [21]	32	0.438	0.264–0.623	3.5
Awad et al.1984 [84]	57	0.667	0.529–0.786	3.9
Barbalias et al. 1998 [54]	90	0.578	0.469–0.681	4.0
Betts et al. (1993)[9]	70	0.900	0.805–0.959	4.2
Bradley et al. 1978 [85]	99	0.619	0.562–0.674	4.3
Bradley et al. 1973 [19]	302	0.596	0.493–0.693	4.1
Gallien et al. 1998[55]	149	0.409	0.33–0.493	4.1
Giannantoni et al. 1999 [86]	116	0.81	0.727–0.877	4.2
Goldstein et al. 1982 [56]	86	0.756	0.651–0.842	4.1
Gonor et al. 1985 [57]	64	0.781	0.66–0.875	4.0
Khan et al. 2009 [87]	73	0.589	0.468–0.703	3.9
Kim et al. 1998 [88]	90	0.511	0.403–0.618	4.0
Koldewijn et al. 1995 [59]	212	0.34	0.276–0.408	4.2
Lemack et al. 2007 [89]	108	0.574	0.475–0.669	4.1
Mayo et al. 1992 [90]	89	0.775	0.674–0.857	4.1
Nakipoglu et al. 2009 [91]	52	0.269	0.156–0.41	3.9
Onal et al. 2009 [61]	75	0.347	0.24–0.465	4.0
Patti et al. 1997 [20]	75	0.440	0.325–0.559	4.0

Petersen et al.1984[92]	88	0.830	0.734–0.901	4.1
Porru et al. 1997 [62]	120	0.433	0.343–0.527	4.1
Sirls et al. 1994 [23]	113	0.699	0.606–0.782	4.1
Van Poppel et al. 1983 [93]	160	0.663	0.584–0.735	4.2
Ventimiglia et al. 1998 [22]	236	0.292	0.235–0.355	4.2
Wheeler et al. 1983 [94]	18	0.556	0.308–0.785	3.1
Pooled rate (95% CI)				**0.582 (0.505–0.659)**
Heterogeneity				**I^2 = 94.2%** **Chi-square p < 0.001**

CI = confidence interval.

Supplementary Table J. Results of the meta-analyses of the studies reporting rates of detrusor overactivity in patients with spinal cord injury

Study	No. of patients	Rate	95% CI	Weights (%): random-effect meta-analysis
Beric et al. 1992 [83]	17	0.765	0.501–0.932	6.3
Chen et al. 2009 [84]	134	0.321	0.243–0.407	7.5
Ehren et al. 1994 [85]	38	0.684	0.513–0.825	7.0
Gupta et al. 2009 [4]	52	0.827	0.697–0.918	7.3
Morita et al. 1994 [86]	76	0.684	0.567–0.786	7.4
Patki et al. 2006a) [87]	10	0.600	0.262–0.878	5.3
Patki et al. 2006b [88]	64	0.391	0.271–0.521	7.2
Sacomani et al. 2003 [89]	71	0.113	0.050–0.210	7.6
Suzuki et al. 2001[90]	103	0.350	0.258–0.450	7.5
Tosi et al. 1993[91]	35	0.800	0.631–0.916	7.1
Van Kerrbroeck et al. 1993 [92]	93	0.710	0.606–0.799	7.4
Ventimiglia et al. 1998 [22]	166	0.241	0.178–0.313	7.6
Watanabe et al. 1998 [93]	44	0.182	0.082–0.327	7.2
Weld et al. 2000 [44]	243	0.407	0.345–0.472	7.6
Pooled rate (95% CI)				**0.497 (0.373–0.622)**
Heterogeneity				**I^2 = 95.1%** **Chi-square p < 0.001**

CI = confidence interval.

Supplementary Table K. Results of the meta-analyses of the studies reporting rates of detrusor overactivity in patients with Parkinson's disease

Study	No. of patients	Rate	95% CI	Weights (%): random-effect meta-analysis
Andersen et al. 1976 [83]	24	0.625	0.406–0.812	10.8
Araki et al. 2000 [84]	70	0.671	0.549–0.779	11.4
Berger et al. 1987 [8]	29	0.897	0.726–0.978	11.4
Hattori et al. 1992 [67]	39	0.487	0.324–0.652	11.1
Pavlakis et al. 1983 [32]	30	0.933	0.779–0.992	11.5
Ransmayr et al. 2008 [85]	15	0.400	0.163–0.677	10.4
Sakakibara et al. 2001[86]	21	0.810	0.581–0.946	11.0
Stocchi et al. 1997 [87]	30	0.367	0.199–0.561	11.0
Ventimiglia 1998 [22]	52	0.077	0.021–0.185	11.6
Pooled rate (95% CI)				**0.586 (0.343–0.830)**
Heterogeneity				**I^2 = 96.4%** **Chi-square p < 0.001**

CI = confidence interval.

Supplementary Table L. Results of the meta-analyses of the studies reporting rates of detrusor overactivity in patients with stroke

Study	No. of patients	Rate	95% CI	Weights (%): random-effect meta-analysis
Han et al. 2010 [83]	84	0.595	0.483–0.701	15.9
Khan et al. 1990 [84]	33	0.788	0.611–0.91	13.9
Kim et al. 2010 [85]	69	0.638	0.513–0.75	15.5
Motola et al. 1990 [86]	30	0.455	0.304–0.612	13.6
Motola et al. 1988 [87]	44	0.433	0.255–0.626	12.1
Nitti et al. 1996 [88]	38	0.816	0.657–0.923	14.7
Tsuchida S et al 1983 [89]	39	0.769	0.607–0.889	14.3
Pooled rate (95% CI)				**0.647 (0.542–0.753)**
Heterogeneity				**I^2 = 75.4%** **Chi-square p < 0.001**

CI = confidence interval.