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| Study Name/ Year | Design | Study Quality | Indication SNM\* | SNM\* Procedure | Follow-up duration | Study interventions | Total N | N received intervention | Infection rate |
| Washington 2007 | Retrospective chart review | C | Refractory UUI\*, urinary frequency, and NOUR\* | Stage II | Mean 147.4 days  (33-461 days) | 1. Pre-and-post-op\* antibiotics 2. Skin prep 3. Irrigation   Pre-Op antibiotics:  Either 1st or 2nd generation cephalosporin  Post-op antibiotics:  Either oral levofloxacin or ciprofloxacin for 7 days  Betadine scrub  Nonspecific antibacterial irrigation | 37 | 37 | **13.5%** (5/37) |
| Guralnick 2007 | Case control | B | 1. OAB\* Wet n=32 (42%) 2. OAB\* Dry n=20 (26%) 3. NOUR\* n=11 (15%) 4. Painful bladder n=13 (17%) | Stage I  Stage II | 3 years | 1. Pre-op\* antibiotics 2. Skin prep 3. Technique   Pre-Op antibiotics:  Single dose IV cephalexin or moxifloxacin if PCN\* allergic  Skin prep:  Pre-Op hibiclens shower  Povidone-iodine prep or CHG\* if iodine allergic  Technique: Ioban barrier sheath after prep | 76 | NR | **12.5%** (9/72)  15.4% (4/26) unsuccessful Stage I  10.0% (5/50) successful Stage I  4 excluded from analysis (ultimately had infection of IPG) unclear if subclinical at stage I or occurred at stage II. |
| Faucheron 2010 | Prospective cohort | B | 1. Neurological FI\*n=104 (85%) 2. Idiopathic FI\*n=19 (15%) | Stage II | Mean 48.5 months | 1. Pre-op\* antibiotics   IV cefoxitin 1 hour before permanent IPG | 87 | 87 | **4.6%** (4/87) |
| Haraway 2013 | Retrospective cohort | B | Refractory urinary urgency and frequency, UUI\*, or NOUR\* | Stage II  Combined stage I/II | 3 years | 1. Pre-and-Post op\* antibiotics 2. Skin prep   Pre-Op antibiotics:  Cefazolin alone, vancomycin alone, or vancomycin + gentamicin  Post-Op antibiotics:  5-7 days oral cephalexin or if allergy no antibiotics, ciprofloxacin, levofloxacin, TMP/SMX\*  Skin prep:  Preoperative shower with antibacterial soap  Iodine-based scrub and paint +/- additional alcohol-based preparation | 135 | Cefazolin n=35  Vancomycin alone n=49  Vancomycin + gentamicin n=51 | **5.9%** (8/135)  17.1% (6/35) cefazolin  2.0% (1/50) vancomycin alone  1.96% (1/51) vancomycin + gentamicin  OR 7.34 (1.25-54.77), p=0.01 for infection with pre-op cefazolin |
| Lai 2013 | Prospective cohort | B | 1. NOUR\* n=11 (29%) 2. UUI\* n=10 (26%) 3. Urgency/Frequency\* n=4 (11%) 4. IC\* n=3 (8%) | Stage I  Stage II | 6 months | 1. Pre- and post-op\* antibiotics 2. Skin prep 3. Irrigation   Pre-Op antibiotics: 1g Vancomycin  Post-Op antibiotics:  Stage I: 7 days oral cephalexin or ciprofloxacin if PCN\* allergic  Stage II: additional 1g IV Vancomycin 12h postop, 7 days oral cephalexin or ciprofloxacin  10-minute Betadine or CHG\* skin paint  Irrigation: 500 ml normal saline + 50,000 U bacitracin after lead placement | 38 | 38  19- Chlora Prep  19- Betadine | **10.5%** (4/38)  0 stage I  4 stage II |
| Gorissen 2015 | Prospective cohort study | C | Refractory FI\* | Combined stage I/II | Mean follow up 13 months (3-25 months) | 1. Pre-op\* antibiotics 2. Skin prep 3. Irrigation   Pre-op antibiotics: 1.2 g IV amoxicillin/clavulanic acid  Iodine skin prep  Irrigation: 80 mg gentamicin irrigation of IPG pocket | 61 | 61 | 0% (0/61) |
| Brueseke 2015 | Retrospective cohort | B | NR\* | Stage I  Stage II |  | 1. Skin prep 2. Pre-and-post op\* antibiotics (not specified)   Skin prep:  Home 4% CHG\* wash, shower night before and morning after surgery | 699 | 346 procedures | **4.3%** 30/699  **1.7%**( 6/346) (after CHG\* protocol)  **7.4%** (24/323) before CHG\* protocol  Measured in procedures  Total patients 290 with total procedures 699 |
| Zhang 2015 | Retrospective cohort | C | Refractory lower urinary tract dysfunction | Stage I  Stage II | NR\* | 1. Pre-and-Post op\* antibiotics 2. Skin prep 3. Irrigation   Pre-Op antibiotics:  Cefoxitin 2g IV (if negative skin test), levofloxacin 0.5 g IV if skin test positive  Post-op antibiotics:  Additional dose IV cefoxitin or levofloxacin 12 hours post-op.  Oral cefdinir 100mg TID\* for 7 days or levofloxacin 500 mg daily 7 days  Iodophor skin prep (3 times)  Sterile water irrigation | 23 | 19 cefoxitin/  Cefdinir  4 levofloxacin | **(0%)** 0/23 |
| Koh 2015 | Cohort study | C | Refractory FI\* | Combined stage I/II | Mean follow up 35 months  (2-67 months) | 1. Irrigation 2. Pre-op\* antibiotics (not specified)   IPG\* pre-soaked in gentamicin | 52 | NR\* | **13.5%** (7/52) |
| Kavvadias 2017 | Retrospective chart review | C | 1. OAB\* n=41 (70%) 2. NOUR\* n=15 (25%) 3. Pelvic pain n=3 (5%) | Stage II | Median 14 months | 1. Pre-op\* antibiotics   Pre-Op Cefuroxime | 59 | 59 | **8.5%** (5/59) |
| Myer 2018 | Case control | B | Cases   1. OAB\* n=29 (76%) 2. NOUR\* n=4 (11%) 3. FI\* n=5 (13%)   Controls   1. OAB\* n=56 (78%) 2. NOUR\* n=8 (11%) 3. FI\* n=8 (11%) | PNE \*  Stage I  Stage II  Combined stage I/II | At least 180 days after implant | 1. Pre-op\* antibiotics 2. Post-op\* antibiotics (not specified) 3. Skin prep 4. Irrigation 5. Technique   PNE/Stage I Preop antibiotics:  Cephalosporins  Aminoglycosides  PCN\*  Glycopeptides  Other/None  Stage II/combined I/II Preop antibiotics:  Cephalosporins  Aminoglycosides  PCN\*  Vancomycin  Other/none  PNE/Stage I Skin prep:  Home CHG\* wash before surgery  CHG\*  Betadine-iodine  Other  Antibiotic irrigation solution used (5% gentamicin, bacitracin, and other)  Number of days post- op antibiotic prophylaxis (<7 or ≥ 7 days)  Technique: pocket depth | 1930 | NR | **1.97%** (38/1930)  IPG:  38 cases  72 matched controls  No difference between cases (infection) and control groups in intraoperative antibiotic class, post-procedure antibiotic use and duration of use, home chlorhexidine wash before surgery, skin prep solution type, or irrigation between case and control groups in testing or implant stage.  Pocket depth ≥ 3cm was significantly associated with infection requiring explant (21% of cases, 0% of controls, P=0.031)  Hematoma formation: n=5 (13%) cases, 0 controls. |
| Manjunath 2019 | Retrospective cohort | C | Not all reported, included Neurologic etiologies for voiding dysfunction 16/75 (21%) | Stage I  Stage II  Standard and abdominal placement of IPG | 35 months | 1. Pre-and-post op\* antibiotics   Pre-op antibiotics:  Vancomycin and gentamicin  Post-op antibiotics:  Dicloxacillin or Bactrim (if PCN\* allergic) oral 7 days | 75 | NR\* | **4.0%** (3/75)  1.7% (1/60) standard placement  13.3% (2/15) abdominal placement |
| Yiannakou 2019 | Randomized controlled trial | A | Refractory idiopathic chronic constipation | Stage I  Stage II | 6 weeks for stage I and 6 months after IPG\* | 1. Pre-op\* antibiotics 2. Irrigation   Pre-op antibiotics:  Originally 80 mg IV gentamycin. Changed to either flucloxacillin 1g and gentamycin 120 mg IV or teicoplanin 400 mg and gentamycin IV depending on MRSA\* status due to infection rate.  Irrigation solution: all implantable materials soaked in gentamycin solution | 45 | NR\* | **22.2%** (10/45)  6/45 (13%) stage I lead infection  3/27 (11%) IPG\* infection |
| Agnello 2022 | Retrospective cohort | B | 1. NOUR\* n=107(46%) 2. Urinary incontinence due to DO n=65(28%) 3. Dysfunctional voiding n=29(13%) 4. Pelvic pain n=17 (7%) 5. FI\* n=14 (6%) | Stage I | Minimum 8 weeks | 1. Pre- and post-op\* antibiotics 2. Skin prep 3. Technique   Pre-op antibiotics: 2g IV cephazolin or 500 mg IV levofloxacin (if PCN allergic)  Post-op antibiotics: IV cephazolin 1g per day 2 days and oral cefixime 400 mg daily 5 days OR IV levofloxacin 500 mg per day 2 days and oral levofloxacin 500 mg daily after discharge  Skin prep: double surgical scrub with povidone-iodine (Iodoten 7.5%) or CHG\* if Iodine allergy  Technique: <4 cm skin incision gluteal pocket, exit wire “medicated” with sterile gauze before connecting temporary stimulator | 232 | 232 | **2.6%** (6/232)  1.3% (3/232)  pre-op levofloxacin 500 mg IV,  post-op levofloxacin 500 mg IV per day 2 days, 500 mg oral per day 5 days  1.3% (3/232)  pre-op cefazolin 2g IV  post-op cefazolin 1g IV per day 2 days, oral cefixime 400 mg oral per day 5 days |
| Trump 2022 | Retrospective cohort | B | 1. FI\* n=2 (1%) 2. NOUR\* n= 27 (16%) 3. Urgency/frequency\* n=141 (83%) | Combined Stage I/II | Minimum 3 months from implantation | 1. Pre-op\* antibiotics 2. Antimicrobial Pouch 3. Skin prep 4. Irrigation 5. Technique   Pre-op antibiotics:  2g cefazolin (3g if >120kg), clindamycin if CI\* cefazolin  Pouch: TYRX antibiotic pouch utilizing minocycline and rifampin  Skin prep: CHG\*  Normal saline irrigation IPG\* pocket prior to battery placement  Technique: skin incised sharply, IPG\* pocket closed 2 layers, skin glue over sites, occlusive dressing 48 hours. | 170 | 85 pouch  85 no pouch | **2.9%** (5/170)  **0%** antimicrobial pouch (0/85)  **5.9%** no antimicrobial pouch (5/85) |
| Goudelocke 2023 | Cohort study (retrospective and prospective) | B | Pre-Protocol:   1. Urgency/frequency\* n=66 (76%) 2. NOUR\* n=21 (24%)   Protocol   1. Urgency/frequency\* n=322 (73%) 2. NOUR n=121 (27%) 3. FI\* n=1 (0.2%) | Stage II  Combined Stage I/II    Replacement/Revision | Mean follow up 58.1 months (both groups) | Pre-Protocol/Protocol:   1. Pre-op\* antibiotics 2. Skin prep   **Protocol:**  Pre-op antibiotics:  Bilateral nasal cultures, if positive MRSA or MSSA treated with 5 days intranasal mupirocin BID  Pre-op vancomycin if MRSA\* positive Nare cultures  MSSA\* positive or negative cultures treated with preop cefazolin (unless allergic)  Skin prep:  2% CHG\* wipes night before/morning of surgery  2-agent prep 4% CHG scrub followed by alcohol/iodine polyacrylex paint for pre-op scrub  **Pre-Protocol:**  Pre-op antibiotics: Cefazolin  2% CHG\* in 70% isopropyl skin prep | 531 | 87 Pre-protocol  444 Protocol | **1.5%** (8/531)  Pre-Protocol: **4.6%** (4/87)  Protocol: **0.90%** (4/444)  Risk ratio of infection 0.19 for pre/post protocol (p=0.01)  Odds-ratio 5.1 |

\*SNM= Sacro neuromodulation, Op= operative, PCN= penicillin, IPG= implantable pulse generator, NOUR= non-obstructive urinary retention, FI= fecal incontinence, UUI= urge urinary incontinence, IC= interstitial cystitis, MRSA+ methicillin-resistant Staphylococcus aureus, MSSA= methicillin- sensitive Staphylococcus aureus, SNS= sacral nerve stimulation , urgency/frequency= refractory urinary urgency with frequency, OAB= overactive bladder including urinary urgency, frequency and urge incontinence, NR= not reported , PNE= percutaneous nerve evaluation, CHG= chlorhexadine gluconate, TMP/SMX= trimethoprim-sulfamethoxazole, TID= three times daily