Author Year; Country Score Research Design Total Sample Size	Methods	Outcome
Valles et al. 2021 Spain RCT Level 1 (PEDro=) N=16	**Objective:** To study the efficacy of external anal sphincter (EAS) infiltration with type-A botulinum toxin (BTX-A) in motor incomplete SCI patients with outlet constipation. **Population:** motor-incomplete SCI ASIA grade C or D; more than 1 year since injury; 4 female; mean age 49 (29-68) y. **Treatment:** EAS infiltration with BTX-A vs. placebo infiltration **Outcome Measures:** Rome III criteria evaluated constipation, Wexner score evaluated fecal incontinence, Obstructed Defecation Scoring System assessed outlet (obstructed) defecation, NBDS measured severity of NBD, CVE-20 questionnaire assessed QOL, numerical rating scale assessed level of satisfaction related to bowel function.	1. People in the BTX-A group reported an improved level of satisfaction related to bowel function at 1-month post infiltration (p=0.02) and in the ODSS at 3-months post infiltration (p=0.03) compared to baseline levels. 2. Constipation severity at 1 month (p=0.02) and 3 months (p=0.02) post infiltration was improved compared to baseline. 3. NBS at 3-months post infiltration (p=0.02) significantly improved compared to baseline. 4. Fecal incontinence, colonic transit time and QOL did not significantly change after BTX-A infiltration. 5. EAS voluntary contraction pressure decreased 3-months post BTX-A infiltration compared to baseline (p=0.02) and in comparison to the placebo group (p=0.01).
Tamburella et al. 2022 Italy RCT Level 1 (PEDro=) N=13	**Objective:** To explore OMT effects on NBD in individuals with SCI compared with Manual Placebo Treatment (MPT). **Population:** OMT Group: mean age 37.5 (11,1) y; time since injury 8.16 months, 3 AIS A, 0 AIS B, 2 AIS C, 2 AIS D; 71% traumatic etiology; 14% female MPT Group: mean age 52.6 (22, 5) years, time since injury 7.66 months, 2 AIS A, 1 AIS B, 1 SIS C,	1. There was a more positive trend in the OMT group for the NBDS general satisfaction question regarding the bowel management. 2. KESS score improved more in the OMT group between E1 and E2 compared to the MPT group but was not significantly different. 3. PAC-QOL worries score improved within the OMT group between E1 and E2 (p=0.0029), between E0 and E2 (p=0.031) and E0 and E3 (p=0.041). 4. VAS daily score significantly improved after treatments in the

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	2 AIS D; 33% traumatic etiology; 17% female **Treatment:** Osteopathic manipulative treatment once a week for four weeks. Included myofascial techniques, balanced ligamentous tension, visceral manipulations and osteopathy in the cranial field vs. Manual placebo treatment (MPT) once a week for four weeks. Included passive mobilizations of the pelvis, upper and lower limbs, cervical spine and light manual touch of the abdomen and thoracic region **Outcome Measures:** Neurogenic Bowel Dysfunction Scale (NBDS). Secondary outcome measures include Knowles Eccersley Scott Symptom Scale (KESS) and patient Assessment of Constipation Quality of Life (PAC-QOL) measuring constipation. Visual Analogue Scale was used. Evaluation at enrollment (E0), 30 days after enrollment (E1), at the end of 4 treatments (E2), and 30 days after last treatment (E3).	OMT group (sense of constipation; p=0.031, swelling; p=0.006; pain; not statistically significant) compared to E1, whereas there were no changes in the MPT group. 5. Within the OMT group, NBDS score improved from E0 to E3 (p=0.0011) and from E1-E3 (p=0.040) whereas NBDS in the MPT group did not significantly improve.
Albu et al. 2021 Spain RCT Level 1 (PEDro=) N=10	**Objective:** Investigate the safety and clinical recovery effects of intrathecal infusion of expanded Wharton jelly mesenchymal stromal cells (WJ-MSCs) in chronic complete SCI patients.	1. Bowel constipation did not significantly change after MSC or placebo intervention (p>0.05) as measured by Rome III criteria. 2. Wexner score at baseline indicated low severity of fecal incontinence for all participants, which did not

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	Population: 10 people with complete, thoracic SCI. 3 females, age range 25-47 years **Treatment:** WJ-MSC intrathecal infusion compared with placebo infusion in crossover design **Outcome Measures:** AIS motor and sensory score, lower limb spasticity, neuropathic pain and electrical perception and pain thresholds, SCIM III, WHOQOL-BREF were assessed at baseline, 1 month, 3 months, and 6 months after each intervention. Anorectal manometry, urodynamic studies, Qualiveen questionnaire, Wexner score and Rome III diagnostic questionnaire were conducted at baseline and 6 months after each intervention	significantly change after MSC or placebo interventions ($p>0.05$). 3. Anorectal manometry parameters (anal resting pressure, voluntary anal contraction, change in rectal pressure during squeeze, rectoanal inhibitory reflex, excitatory reflex) did not significantly change after MSC or placebo intervention ($p>0.05$).
DiMarco et al. 2021 USA Cohort Level 2 N=5	**Objective:** To systematically determine whether use of the spinal cord stimulation (SCS) system to restore cough may improve bowel management (BM) in individuals with spinal cord injury (SCI). **Population:** Age: Mean 37 years Level/Severity: 1 C4-C6,1 C3-C6, 1 C6, 1 C3, 1 C7/T1; 5 AIS A, motor complete cervical SCI Female: 0% Etiology: 4 trauma, 1 abscess	1. Bowel management (BM) time fell by 84% at week 21. 2. Largest changes in bowel management time occurred by week 4 (28.7% and 17.7% of control values by weeks 4 and 21 respectively). 3. Gradual reduction in BM time was related to increase in maximum airway pressure generation with SCS over the reconditioning period.

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	Time of injury: All ranged between 2-4 years **Treatment**: Implanted spinal cord stimulation (SCS) cough system was chronically applied at home 2-3 times a day when the bowel regimen was performed **Outcome Measures**: Airway pressure generation with SCS, weekly completion of Bowel Routine Log including B< time, mechanical measures and medications employed	
Darrow et al. 2019 Canada/USA Case series Level 4 N=2	**Objective:** Key questions include whether epidural spinal cord stimulation can meaningfully restore function to radiographically severe injuries, whether the intervention can improve function in people with long-term chronic SCI, how consistent and predictable recovery may be when comparing individuals, and whether epidural spinal cord stimulation can restore autonomic control of cardiovascular, bowel, bladder and sexual function. **Population:** 2 female participants with chronic thoracic AIS A SCI. Participant 1 was 52y and 10y from injury (T8). Participant 2 was 48 y and 5 y from injury (T4). Participant 1 had no type of rehabilitation 6 months prior to the study	1. Participant 1 had no change in bowel function after eSCS. 2. Participant 2 had NBDS severity rating change from Moderate to Severe after eSCS, although reported bowel care regimen time decreased from 90 mins to less than 30 minutes.

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	whereas participant 2 had 60 h of outpatient rehabilitation in the 6 months prior. **Treatment:** Epidural spinal cord stimulation (eSCS) **Outcome Measures:** Neurogenic Bowel Dysfunction Score (NBDS) for bowel function	