Author Year; Country Score Research Design Total Sample Size	Methods	Outcome
[Boucher et al. 2019](#) England Retrospective Level 3 N=83	**Objective:** to discover the reasons behind individuals choosing to have a colostomy early following SCI, rather than later. And establish whether early colostomy is safe and advisable **Population:** N=83 Female: 18% Age: 49 years range (15-90y) Early colostomy: mean 58 years Mean time from SCI to colostomy: 6.5 months for early group and 214.6 months for later group **Treatment:** N/A **Outcome Measures:** survey asking reasons for having colostomy	1. Most frequent reason for having a colostomy in the later group were localized bowel care complications. Approximately half of those choosing a colostomy had cervical spine injuries. 2. For the early colostomy group, reliance on caregiver and increased independence and to improve QOL were also frequent reasons. 3. 40% of the early group experienced no later complications, compared to 69,2% for the later group (p=0.0005). 4. No significant difference between groups requiring further surgery (p=0.28).
[Randell et al. 2001](#) New Zealand Case-control Level 3 N=52	**Objective:** To determine whether a colostomy changes quality of life in patients with a spinal cord injury. **Population:** 26 participants with colostomy: 10 with cervical SCI, 16 with lumbar/lower thoracic SCI; age: 22-87yrs, matched with 26 participants without colostomy. **Treatment:** Colostomy (with vs. without) **Outcome Measures**: Burwood Quality of Life Questionnaire: 5 areas: systemic symptoms, and	1. No significant difference in the group with a colostomy compared to the group without a colostomy in regard to their general well-being, emotional, social or work functioning.

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	emotional, social, work and bowel function.	
[Safadi et al. 2003](#) USA Case-control Level 3 N=45	**Objective:** Assess the quality of life (QOL), health status, and time to bowel care before and after stoma formation. **Population**: 21 tetraplegics, 24 paraplegics; 44M 1F; Mean age 55.9yrs, **Treatment**: 20 right side colostomies (RC), 21 left side colostomies (LC), 7 ileostomies (IL) **Outcome Measures**: quality of life, colonic transit time, bowel care time	1. Colonic transit time was significantly longer in the right side colostomy compared to the left side colostomy and the ileostomy. 2. In all groups, quality of life increased (RC: 49 to 79, LC: 50 to 86, IL: 60 to 82 min) and bowel care time decreased (RC: 102 to 11 min, LC: 123 to 18 min, IL: 73 to 13 min).
[Negosanti et al. 2020](#) Italy Case series Level 4 N=19	**Objective:** to explore how a colostomy may be considered to improve bowel management in SCI patients when other conservative treatments fail **Population:** N=19 Age: 55.21 years old (range 19–73) Female: 15.8% Level: 13 paraplegia 5 tetraplegia 1 spina bifida Time since injury: mean 25.68 years (range 1–56) **Treatment:** subtotal colectomy **Outcome Measures:** surgery outcomes, including complications and patient satisfaction.	1. No major complications were reported after the surgical procedure. In two cases, we observed small dehiscences of the abdominal incision which were treated conservatively during hospital stay. 2. In two other cases, mucorrhoea was observed. 3. Reported a high degree of patient satisfaction with an improved quality of life, but further studies with appropriate tools are necessary to assess this finding.

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Kelly et al. 1999 UK Case-control Level 3 N=14	**Objective:** To investigate the role of intestinal stomas in alleviating physical and psychological problems associated with bowel dysfunction. **Population:** Level of injury: C4-L2 (3 cervical, 10 thoracic, 1 lumbar); 12M 2F; Age at time of operation: mean (range) 54.8 (20-65) yrs; time from injury to stoma formation: mean (range)15 (2-37) yrs **Treatment:** 12 participants underwent left iliac fossa end colostomy and 2 participants right iliac fossa end ileostomy **Outcome Measures:** Time spent on bowel care per week; independence in bowel care; quality of life	1. Colostomy participants (N=12): mean time spent on bowel care per week before stoma formation was 8.8 h (0.6-12.2) compared with 1.4 h (0.3-3.5) after; 50% of these patients were independent in bowel care before, 92% independent after; 10 patients claimed that the colostomy had a beneficial effect on their quality of life. 2. Illeostomy patients (N=2): mean time spent on bowel care per week before ileostomy was 17.5 h and this was unchanged after ileostomy formation. 1 participant decreased the time he spent on bowel care from 28 h to 14 h; the other developed complications and his time increased from 7 h to 21 h.
Branagan et al. 2003 UK Case series Level 4 N=32	**Objective:** To evaluate the effect of colostomy formation on both quality of life and time taken for bowel care. **Population:** 10 participants with cervical SCI, 18 with thoracic, and 3 lumbar; Age at injury: average 28.9 yrs; Duration of injury: mean 17.1 years **Treatment:** Medical records were reviewed for participants who had a previous colostomy. **Outcome Measures:** Results of surgery	1. The average time spent on bowel care per week decreased significantly from 10.3 hours to 1.9 hours after the colostomy. 2. 18/31 participants felt the colostomy gave them greater independence. 3. 25 participants wished they had been offered a stoma earlier. 4. No participants wanted a stoma reversal.

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[Rosito et al. 2002](#) USA Case series Level 4 N=27	**Objective:** To evaluate the effects of colostomy on the quality of life (QOL) in patients with spinal cord injury (SCI). **Population:** Level of injury: C4-L3 (17 complete, 10 incomplete); mean age: 62.9 yrs; 26M 1F; Duration of injury: 25.8yrs **Treatment:** Colostomy **Outcome Measures:** Quality of life questionnaire with 5 domains: physical health, psychosocial adjustment, body image, self-efficacy, and recreation/leisure	1. Quality of life improved significantly after colostomy. 2. All 27 patients were satisfied, 16 very satisfied 3. Colostomy reduced the number of hospitalizations caused by chronic bowel dysfunction by 70.4%. 4. After colostomy, the average amount of time spent on bowel care was reduced significantly from 117.0 min/day to 12.8 min/day. 5. Significant improvements were recorded in the areas of physical health, psychosocial adjustment, and self-efficacy.
[Munck et al. 2008](#) Belgium Case-series Level 4 N=23	**Objective:** To determine the effect of constipation and fecal incontinence on the quality life of patients with spinal cord injury (SCI). **Population:** 23 SCI participants who had a colostomy in the digestive surgery department of Brugmann Hospital between Jan 1996 and Dec 2005 (age range 22-72). Level of injury: 13 dorsal, 7 cervical, 3 lumbar. **Treatment:** Colostomy **Outcome Measures:** Demographic information and medical information on the stoma formation and complications, collected from participants' medical records; quality of life questionnaire.	1. 10 participants had a stoma for perineal wounds 2. Average time spent on bowel care per week decreased from 5.95 hr prior to stoma formation to 1.5 hr after 3. Of the 10 patients, 3 reported cutaneous irritations and 1 reported detachment of the pocket 4. Of the 10 patients, 9 reported having much easier bowel care since the stoma formation, and 6 felt that the stoma had given them greater independence.

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[Stone et al. 1990b](#) USA Case Series Level 4 N=7	**Objective:** To determine the effectiveness and safety of colostomy when it is performed for a late complication of SCI. **Population:** Level of injury: C4-T10; Age: mean 51.6yrs; Duration of injury: mean 15.7 years **Treatment:** Medical records were reviewed for participants who had undergone a colostomy **Outcome Measures:** Efficacy of colostomy.	1. All seven participants who had colostomy performed as an adjunct to the treatment of perianal pressure ulcers successfully healed their ulcers. 2. The amount of time spent on bowel care decreased dramatically in the patients with prolonged bowel care.
[Luther et al. 2005](#) USA Cross-sectional Level 5 N=370	**Objective:** To compare patient outcomes and quality of life for people with neurogenic bowel using either a standard bowel care program or colostomy. **Population:** SCI participants in 6 centers that were selected to be representative of the 23 Veteran Affairs SCI centers. Survey respondents with colostomies were matched to controls based on age, year of injury, classification of paralysis and marital status by calculating propensity scores. Comparison of 74 patients with a sample of 296 matched controls without colostomies. **Treatment:** Colostomy **Outcome Measures:** Bowel care-related items; quality of life.	1. No statistically significance differences were found in the demographic distributions for cases and controls. 2. No statistically significant differences were reported between the cases and the matched controls for any of the bowel care outcomes or bowel-related quality of life. Both groups reported low incidence of accidental/unplanned bowel movements and falls related to bowel care. 3. Mean responses to the quality of life items were generally very high; however, a large number of respondents continue to express dissatisfaction with bowel care. The cases had a much higher percentage of responses (55.7%) in the "very

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		dissatisfied" category than did the controls (41.7%).
[Coggrave et al. 2012](#) UK Retrospective self-report survey Level 5 N=92	**Objective:** To characterise spinal cord injured (SCI) individuals with a stoma, their stoma management and outcomes, to identify sources of information and support for decision making and to explore the impact of a stoma on life satisfaction. **Population:** 26 cervical (15 complete, 10 incomplete, 1 unknown), 61 thoracic (49 complete, 10 incomplete, 2 unknown), 1 missing data on level of injury; 64M:28F; Age: mean (SD) 56(9)yrs; duration of injury: mean (SD) 26(13)yrs; 91% colostomy, 9% ileostomy. **Treatment:** Retrospective analysis of a self-report postal survey of individuals with SCI who had a stoma for bowel management issues (five UK spinal centres) **Outcome Measures:** Tennessee Self-Concept Scale, Satisfaction with Life Scale, Hospital Anxiety and Depression Scale, 3 simple rating scales for satisfaction, ability to live with bowel dysfunction, and how much bowel care restricts life.	1. Participants reported experiencing bowel difficulties for a mean (SD) time of 10 (10) years before surgery. 11% would've preferred surgery a year earlier, 28% up to 5 years earlier, 30% up to 10 years earlier and 32% earlier still. None suggested stoma formation was too early. 2. Participants reporting an ileostomy were significantly more likely to need assistance than those with a colostomy. 3. Laxative use was reduced from 58 to 31% and dietary manipulation to assist bowel care was reduced significantly. 4. 83 (70%) reported they felt very positive about their stoma, whereas 2 participants felt others avoided them due to the stoma.For 23%, there was impact on personal relationships; 9 reported positive impact, 6 negative and 3 neutral.
[Cooper et al. 2019](#) Australia Observational	**Objective:** to examine surgical outcomes and the effect on an	1. Reasons for stoma formation included sacral pressure ulcer (50%) prolonged bowel care

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Level 5 N=43	individual's health-related quality of life **Population:** N=43 Female: 27% Age at injury: median 41 y, mean 44.8 (13-80) y Level: 42.3% cervical 50% thoracic 7.7% lumbar 0% sacral **Treatment:** N/A **Outcome Measures:** 10-point Likert scale asked patients their level of satisfaction with stoma	(35%) fecal incontinence (19%) constipation (8%), autonomic dysreflexia (8%), carer difficulties (8%) and hemorrhoids (4%) 2. 76% reported improvement in health-related quality of life. 72% scored satisfaction with a stoma as 8/10 or more.
Van Ginkel et al. 2021 Netherlands Cross-sectional survey Level 5 N=23	**Objective:** To explore individual satisfaction with bowel stoma and timing of stoma formation. Also, to explore reports of diversion colitis and QOL changes after the stoma formation. **Population:** N=23 Age: 45.2 ± 11.3 y Time since injury: 25.6 ± 15.9 y Level: 7 tetraplegia 16 paraplegia 15 complete 8 incomplete Female: 52% **Treatment:** N/A **Outcome Measures:** Stoma-modified version of NBD score (Stoma-Modified Neurogenic Bowel Dysfunction questionnaire" measured severity of bowel symptoms.	1. 22 (96%) participants were satisfied with their bowel stoma 2. 83% felt their stoma was placed too late 3. >80% reported improvements in the four QOL domains after bowel stoma procedure 4. 9 participants reported stoma-related problems in the last month 5. 7 participants reported diversion colitis in the last three months. 4 of these 7 participants experienced this once a week or more. 2 reported this had moderate influence on daily activities

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	Questions asked regarding experiencing loss of blood, moisture, and mucus to obtain insight in diversion colitis. Satisfaction was classified in five categories (5-item scale), from very dissatisfied to very satisfied. Four domains of QOL (life as a whole, physical health, social life and psychological health) were used to indicate QOL alterations	
Frisbie et al. 1986; USA Cross-sectional Level 5 N=20	**Objective:** To determine the difference in the bowel care of spinal cord injury patients before and after enterostomy. **Population:** Level of injury: 9 cervical, 11 thoracic; 19M 1F; Age: median (range) 55 (27-75) yrs. Duration of the enterostomies at time of interview was, median (range): 11 months (3 months to 14 yrs). **Treatment:** A total of 24 enterostomies were carried out in 20 participants: 17 sigmoid colostomies, 5 transverse colostomies, and 2 ileostomies. **Outcome Measures:** Bowel care time, bowel care frequency, bowel care related complaints, quality of life.	1. Bowel care frequency increased from a median 3 times/week (range 2-7) before enterostomy to a median 7 times/week (range 4-14) after enterostomy. 2. Bowel care duration diminished from a median 6 hours/week (range 0.7-14 hours) before enterostomy to a median 1 hour/week (range 1.3-7 hours) after enterostomy. 3. The number of patients affected by bowel care related complaints pre- vs. post-operatively, respectively, were as follows: abdominal pain in 10 vs. 2, fecal leakage in 8 vs. 0, anorexia in 7 vs. 2, flatus in 9 vs. 4, sweating in 4 vs. 2 and odour in 4 vs. 5.
Bølling Hansen et al. 2016 Denmark	**Objective:** To evaluate the effect of colostomy on bowel function and quality of life	1. 39% reported one or more problems related to the colostomy

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Cross-sectional Level 5 N=18	(QoL) in individuals with spinal cord injury (SCI). **Population:** N=18 (12M, 6F) with SCI and post-SCI colostomy Mean (range) age 49.9 (37-72) Mean (range) time post SCI 20.9 (3-56) years Mean (range) time since colostomy 6.9 (0.5-20) years 8 tetraplegia, 10 paraplegia 8 cervical, 10 thoracic AIS-A/C/D: 15/2/1 17 had sigmoidostomy, 1 had transverse colostomy **Treatment:** N/A **Outcome Measures:** Gastrointestinal transit time (GITT), SF-36, bowel management questionnaire	2. 13/18 reported significant reduction of time required for bowel management, none reported increase of time 3. 17/18 reported better bowel management after colostomy, and would prefer not to reverse the colostomy if given the choice. 4. 15/18 are not concerned about bowel management after colostomy when they travel long distances 5. 16/18 are not dependent on easy access to toilets after colostomy when not at home 6. 9/18 reported positive social influence; 8 reported no change 7. 12/18 had GITT within normal range after colostomy, 2 had GITT over normal range by less than 12h 8. 2/18 reported both leakage & skin issues post colostomy. One reported odor problems, the other reported cosmetic issues & pain 9. Disregarding the physical component, QOL was not significantly lower in the study group compared to a Danish norm group. However, QOL was significantly lower when compared to the subgroup of people with tetraplegia

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Tate et al. 2023 USA Cross-sectional survey plus interviews Level 5 N=18	**Objective:** to investigate factors influencing surgical decision-making to treat neurogenic bladder and bowel (NBB) dysfunction for veterans and civilians with SCI in the USA **Population:** Age: 54.72 (11.87) y Time since injury: 27.06 (16.02) y Level: 22.2% incomplete tetraplegia 27.8 % complete tetraplegia 11.1% incomplete paraplegia 38.9% complete paraplegia Female: 22% **Treatment:** N/A **Outcome Measures:** Semi-structured interviews to reflect factors, decision-making enactment and outcomes such as surgery satisfaction and QOL. Also, COMRADE, Ways of Coping Questionnaire, Bladder and Bowel Treatment Inventory, PROMIS Global Health and Cognitive Abilities scales and SCI-QOL Bladder and Bowel short form.	1. Factors influencing decision making (DM) included recurrent symptoms and complications; balancing dissatisfaction with NBB management against surgery risks; achieving independence and lifestyle adjustments; participant's driven solutions; support and guidance and trust in doctors; and access and barriers to DM. 2. For bowel, colostomy (42.8%) followed by ileostomy (28.5%) and hemorrhoidectomy (28.5%) were the main surgeries. 3. bowel surgeries were performed mainly on those with complete paraplegia (87.5% compared to only 10% for those with bladder surgeries, P<.01). 4. For decisions about colostomies, satisfaction ratings averaged 5.50 while QOL ratings averaged 5.62. Those with ileostomies rated satisfaction with decisions higher (9.75) and QOL (8.25) accordingly. Those who had hemorrhoidectomies reported the highest satisfaction, with both providing ratings of 10 for satisfaction and 9 for QOL.