

## Supplementary

### S1. Search Strategy

Pubmed	((("Colorectal Neoplasms"[MeSH] OR ("Neoplasms"[MeSH] OR carcinoma*[tiab] OR adenocarcinoma*[tiab] OR neoplas*[tiab] OR tumour*[tiab] OR tumor*[tiab] OR oncolog*[tiab] OR malignan*[tiab] OR cancer*[tiab]) AND (colorectal*[tiab] OR colon[tiab] OR colonic[tiab] OR rectal[tiab] OR rectum[tiab] OR sigmoid*[tiab]))) AND ("Colectomy"[MeSH] OR "Colorectal Surgery"[MeSH] OR "Rectum/surgery"[MeSH] OR "Colon/surgery"[MeSH] OR ((large bowel[tiab] OR colorectal*[tiab] OR colon[tiab] OR rectum[tiab] OR rectal[tiab] OR ileocaecal[tiab] OR caecum[tiab] OR low anterior[tiab]) AND (resection*[tiab] OR surg*[tiab] OR anastomo*[tiab] OR "Anastomosis, Surgical"[MeSH])) OR (colectom*[tiab] OR hemicolectom*[tiab] OR "total mesorectal excision*" [tiab] OR proctocolectom*[tiab] OR "abdominal perineal resection*" [tiab]))) AND ("Anastomotic Leak"[MeSH] OR (anastomo*[tiab] AND ("adverse effects"[Subheading] OR "complications"[Subheading] OR leak*[tiab] OR complication*[tiab] OR defect*[tiab] OR separation*[tiab] OR dehiscence*[tiab] OR breakdown*[tiab] OR abscess*[tiab]))) AND ("Quality of Life"[Mesh] OR "quality of life"[tiab] OR life qualit*[tiab] OR living qualit*[tiab] OR "quality of living"[tiab] OR "Activities of Daily Living"[Mesh] OR "activities of daily living"[tiab] OR "activity of daily living"[tiab] OR "activities of daily life"[tiab] OR "activity of daily life"[tiab] OR daily living activit*[tiab] OR daily life activit*[tiab] OR "adl"[tiab] OR "chronic limitation of activity"[tiab] OR self care*[tiab] OR "Health Status"[Mesh] OR "health status"[tiab] OR "level of health"[tiab] OR health level*[tiab] OR "qol"[tiab] OR "hrql"[tiab] OR "hrqol"[tiab] OR "activity of daily living"[tiab] OR "activities of daily life"[tiab] OR "activity of daily life"[tiab] OR daily life activit*[tiab] OR iadl[tiab] OR living qualit*[tiab] OR "quality of living"[tiab] OR "patient reported outcome"))
Cochrane	("Colorectal Neoplasms"[MeSH] OR (("Neoplasms"[MeSH] OR carcinoma*:ti,ab,kw OR adenocarcinoma*:ti,ab,kw OR neoplas*:ti,ab,kw OR tumour*:ti,ab,kw OR tumor*:ti,ab,kw OR oncolog*:ti,ab,kw OR malignan*:ti,ab,kw OR cancer*:ti,ab,kw) AND (colorectal*:ti,ab,kw OR colon:ti,ab,kw OR colonic:ti,ab,kw OR rectal:ti,ab,kw OR rectum:ti,ab,kw OR sigmoid*:ti,ab,kw))) AND ("Colectomy"[MeSH] OR "Colorectal Surgery"[MeSH] OR "Rectum/surgery"[MeSH] OR "Colon/surgery"[MeSH] OR ((large bowel:ti,ab,kw OR colorectal*:ti,ab,kw OR colon:ti,ab,kw OR rectum:ti,ab,kw OR rectal:ti,ab,kw OR ileocaecal:ti,ab,kw OR caecum:ti,ab,kw OR low anterior:ti,ab,kw) AND (resection*:ti,ab,kw OR surg*:ti,ab,kw OR anastomo*:ti,ab,kw OR "Anastomosis, Surgical"[MeSH])) OR (colectom*:ti,ab,kw OR hemicolectom*:ti,ab,kw OR "total mesorectal excision*:ti,ab,kw OR proctocolectom*:ti,ab,kw OR "abdominal perineal resection*:ti,ab,kw)) AND ("Anastomotic Leak"[MeSH] OR (anastomo*:ti,ab,kw AND ("adverse effects"[Subheading] OR "complications"[Subheading] OR leak*:ti,ab,kw OR complication*:ti,ab,kw OR defect*:ti,ab,kw OR separation*:ti,ab,kw OR dehiscence*:ti,ab,kw OR breakdown*:ti,ab,kw OR abscess*:ti,ab,kw)) AND ("Quality of Life"[MeSH] OR (Quality of life OR QoL OR life quality OR health-related quality of life OR HRQoL OR Psychological Well-Being OR health level OR health status OR daily life OR patient reported outcome):ti,ab,kw)
Embase	(exp colorectal tumor/ or exp colorectal cancer/ or ((neoplasm/ or (carcinoma* or adenocarcinoma* or neoplas* or tumour* or tumor* or oncolog* or malignan* or cancer*).ti,ab,kw.) adj3 (colorectal* or colon or colonic or rectal or rectum or sigmoid*).ti,ab,kw.)) AND (exp colorectal surgery/ or exp rectum surgery/ or exp colon surgery/ or ileoanal anastomosis/ or ileorectal anastomosis/ or ((large bowel or colorectal* or colon or rectum or rectal or ileocaecal or caecum or low anterior).ti,ab,kw. adj3 (resection* or surg* or anastomo*).ti,ab,kw. or (colectom* or hemicolectom* or "total mesorectal excision*" or proctocolectom* or "abdominal perineal resection*").ti,ab,kw.)) AND (postoperative complication/su or exp anastomosis leakage/ or anastomosis/co or (anastomo* adj3 (leak* or complication*).ti,ab,kw.)) AND (exp "quality of life"/ OR "life qualit*".ti,ab,kw. OR "quality o? life*".ti,ab,kw. OR exp health status/ OR "health status*".ti,ab,kw. OR "level o? health".ti,ab,kw. OR "health level*".ti,ab,kw. OR qol.ti,ab,kw. OR hrql.ti,ab,kw. OR hrqol.ti,ab,kw. OR "patient reported outcome".ti,ab,kw.)

## S2. Additional study information on perioperative care

Reference	Bowel preparation (pre-op)	Oral antibiotics (pre-op)	Diverting ileostomy (intra-op)	Drain management (intra-op)
Arron et al.	NA	NA	If needed	NA
Ashburn et al.	NA	NA	Based on the discretion of the operating surgeon	NA
di Cristofaro et al.	NA	NA	NA	NA
Hain et al.	NA	NA	Performed routinely and closed 6 to 8 weeks postoperatively if CT showed no AL	Drainage of the pelvic space by a closed suction drain was left in place for 48–72 h in all patients
van Kooten et al.	NA	NA	NA	NA
Lim et al	NA	prophylaxis of 1.5 g of cefuroxime and 500 mg of metronidazole at induction	Based on the discretion of the senior surgeon	NA
Marinatos et al.	NA	NA	Preferred by the surgeon in the majority of the cases where a low-lying anastomosis was necessary	Not clear if this was done routinely or in selected cases
McGiffin et al.	NA	NA	Not performed, exclusion criterium	NA
Miura et al.	Mechanical bowel preparation	Perioperative	Not performed, exclusion criterium	Transanal drainage
Mongin et al.	NA	NA	Performed routinely and closed 6 to 8 weeks postoperatively if CT showed no AL	A pelvic suction drain was always left in place behind the anastomosis
di Re et al.	NA	NA	Based on the surgeon's discretion	NA
Riss et al.	NA	NA	NA	NA
Westerduin et al.	NA	NA	If deemed necessary by the operating surgeon	NA

### S3. Characteristics of anastomotic leakage described by the included studies

Reference	Definition AL	Timeframe for AL diagnosis	Clinical characteristics	Radiological characteristics	Indication for radiological examination/AL assessment	Biochemical elements	Grading system	Re-interventions	Mortality <30 post-operative days
Arron et al.	AL was defined as requiring re-intervention within 30 days following surgery	30 days	NA	NA	Based on clinical symptoms	NA	ISREC classification Grade B & C	- Radiological intervention (n=4) - Re-operation (n=56) - Other (i.e. conservative) (n=3)	NA
Ashburn et al.	Clinical, radiographic, or intraoperative findings guided the primary surgeon to document AL in the medical record and only patients with clinically evident AL were included.	NA	Presence of pus, gas or stool evacuated in a drain, similar discharge from the operative wound, or a rectovaginal fistula or peritonitis.	Distal contrast study	Only patients with clinical symptoms were included	NA	NA	NA	NA
di Cristofaro et al.	NA	NA	NA	NA	NA	NA	Clavien Dindo, Grade III	Reoperation (n = 5)	0
Hain et al.	Symptomatic AL or asymptomatic AL	> 6 months	Signs of sepsis, peritonitis, emission of gas, pus or faeces from the pelvic drain, purulent discharge per anus, or rectovaginal fistula.	CT with water-soluble contrast enema: luminal extravasation or isolated pelvic abscess	Based on clinical symptoms or routine performed at 6–8 weeks postoperatively for ileostomy closure	NA	Symptomatic (n=23) or asymptomatic AL (n=23)	- Delayed stoma reversal (all) - Antibiotic therapy (n=23) - Radiological drainage (n=9) - Trans anal drainage (n=3) - Trans anal dilatation (n=3) - Abdominal re-intervention (n=3) - Fibrin glue injection (n=1)	NA

Reference	Definition AL	Timeframe for AL diagnosis	Clinical characteristics	Radiological characteristics	Indication for radiological examination/AL assessment	Biochemical elements	Grading system	Re-interventions	Mortality <30 post-operative days
van Kooten et al.	All leakages clinically diagnosed or confirmed by contrast enema, or an abscess around the anastomosis	NA	NA	Contrast enema, abscess around the anastomosis	NA	NA	NA	NA	Mortality within 30 days was an exclusion criterion
Lim et al.	Clinical or subclinical AL	< 3 months	Abdominal pain, distention or tenderness, peritonism, rectal discharge, tachycardia, arrhythmias or pyrexia.	'Confirmation' with CT scanning and/or stricture or leak on water-soluble contrast enema	Based on clinical symptoms or routine performed within three months for ileostomy closure	Elevated white cell count or elevated serum C-reactive protein	Clinical vs subclinical AL	- Laparotomy and washout (n=1) - CT-guided drainage (n=3) - Antibiotic therapy (n=6)	NA
Marinatos et al.	All clinically evident ALs	NA	Peritonitis, purulent and/or feculent material from pelvic drain, fever with or without pelvic pain, protracted ileus, drainage per rectum and rectovaginal fistula	Confirmation of the anastomotic insufficiency obtained by CT and/or contrast medium exploration (gastrografin)	Based on clinical symptoms	NA	Clavien Dindo - Grade II: 14 - Grade III: 11	- CT-guided placement of presacral drain (n=1) - Re-laparotomy with pelvic drain placement (n=2) - Re-laparotomy with loop ileostomy (n=3) - Re-laparotomy with takedown of anastomosis and end colostomy construction (n=5)	0
McGiffin et al.	ISREC definition*	Median 5.5 days POD	NA	NA	NA	NA	ISREC classification: Grade A (n=0) Grade B (n=2) Grade C (n=22)	- Percutaneous drain (n=2) - Laparoscopic washout, without ileostomy (n=1) - Laparoscopic washout, with ileostomy (n=17) - Open washout, with ileostomy (n=4)	0

Reference	Definition AL	Timeframe for AL diagnosis	Clinical characteristics	Radiological characteristics	Indication for radiological examination/AL assessment	Biochemical elements	Grading system	Re-interventions	Mortality <30 post-operative days
Miura et al.	ISREC definition	< 30 days	Abdominal pain, abdominal distention, fever, pus or faecal discharge from the pelvic drain. Confirmed by digital rectal examination	Extravasation of endoluminally given water-soluble contrast enema, pelvic abscess and fluid/air bubbles surrounding the anastomosis on CT	Based on clinical symptoms	NA	ISREC classification	- Re-intervention: 30 - Reoperation: 30	One patient died because of AL
Mongin et al.	NA	NA	Peritonitis, fever, discharge of gas, pus or faeces from the abdominal drain or the vagina	CT scan with contrast enema with leakage into the perirectal cavity, leakages from the efferent limb of the colonic pouch, isolated pelvic abscesses without evidence of fistula	Based on clinical symptoms or routine performed at 6–8 weeks postoperatively for ileostomy closure	NA	Symptomatic AL (n=11) vs asymptomatic AL (n=41).	- Antibiotic therapy (n=11) - CT-guided drainage (n=9) - Trans anal drainage (n=2) - Reoperation (n=13)	0
di Re et al.	Leak in the bowel anastomosis that is identified at reoperation, post-operative imaging or evidence of anastomotic stenosis on routine endoscopic examination, clinical or radiological examination	NA	Stenosis	Presence of extraluminal gas or peri-anastomotic collection on post-operative imaging	NA	NA	Contained (66%) vs not contained (10%) and stricture only (24%)	- Antibiotics only (39%) - Percutaneous radiological drainage (9%) - Operative abdominal drainage (19%) - Transrectal drainage (6%) - Anastomotic dilatation (24%) - Combined percutaneous and transrectal drainage (2%) - Combination of abdominal and	0

Reference	Definition AL	Timeframe for AL diagnosis	Clinical characteristics	Radiological characteristics	Indication for radiological examination/AL assessment	Biochemical elements	Grading system	Re- interventions	Mortality <30 post- operative days
								transrectal drainage (1%)	
Riss et al.	NA	NA	NA	NA	NA	NA	ISREC classification: Grade A (n=7) Grade B (n=3) Grade C (n=6)	Re-laparotomy in 6 patients.	NA
Westerduin et al.	AL, pelvic abscess or fistula	NA	NA	NA	NA	NA	NA	Re-do anastomosis (surgery)	0

*AL, anastomotic leakage; NA, not applicable; CT, Computed Tomography; ISREC, the International Study Group of Rectal Cancer; POD, postoperative days.*

*\*‘A defect of the intestinal wall integrity at the colorectal or colo-anal anastomotic site leading to a communication between the intra- and extra-luminal compartments’*

## S4. Detailed information of questionnaires used in more than one study

- a. EORTC QLQ-CR29 – downloaded from <https://qol.eortc.org/questionnaire/qlq-cr29/>



### EORTC QLQ – CR29

Patients sometimes report that they have the following symptoms or problems. Please indicate the extent to which you have experienced these symptoms or problems during the past week. Please answer by circling the number that best applies to you.

During the past week:	Not at All	A Little	Quite a Bit	Very Much
31. Did you urinate frequently during the day?	1	2	3	4
32. Did you urinate frequently during the night?	1	2	3	4
33. Have you had any unintentional release (leakage) of urine?	1	2	3	4
34. Did you have pain when you urinated?	1	2	3	4
35. Did you have abdominal pain?	1	2	3	4
36. Did you have pain in your buttocks/anal area/rectum?	1	2	3	4
37. Did you have a bloated feeling in your abdomen?	1	2	3	4
38. Have you had blood in your stools?	1	2	3	4
39. Have you had mucus in your stools?	1	2	3	4
40. Did you have a dry mouth?	1	2	3	4
41. Have you lost hair as a result of your treatment?	1	2	3	4
42. Have you had problems with your sense of taste?	1	2	3	4
During the past week:	Not at All	A Little	Quite a Bit	Very Much
43. Were you worried about your health in the future?	1	2	3	4
44. Have you worried about your weight?	1	2	3	4
45. Have you felt physically less attractive as a result of your disease or treatment?	1	2	3	4
46. Have you been feeling less feminine/masculine as a result of your disease or treatment?	1	2	3	4
47. Have you been dissatisfied with your body?	1	2	3	4
48. Do you have a stoma bag (colostomy/ileostomy)? (please circle the correct answer)	Yes		No	

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Please go on to the next page

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#### During the past week:

Not at All   A Little   Quite a Bit   Very Much

Answer these questions ONLY IF YOU HAVE A STOMA BAG, if not please continue below:

49. Have you had unintentional release of gas/flatulence from your stoma bag?	1	2	3	4
50. Have you had leakage of stools from your stoma bag?	1	2	3	4
51. Have you had sore skin around your stoma?	1	2	3	4
52. Did frequent bag changes occur during the day?	1	2	3	4
53. Did frequent bag changes occur during the night?	1	2	3	4
54. Did you feel embarrassed because of your stoma?	1	2	3	4
55. Did you have problems caring for your stoma?	1	2	3	4

Answer these questions ONLY IF YOU DO NOT HAVE A STOMA BAG:

49. Have you had unintentional release of gas/flatulence from your back passage?	1	2	3	4
50. Have you had leakage of stools from your back passage?	1	2	3	4
51. Have you had sore skin around your anal area?	1	2	3	4
52. Did frequent bowel movements occur during the day?	1	2	3	4
53. Did frequent bowel movements occur during the night?	1	2	3	4
54. Did you feel embarrassed because of your bowel movement?	1	2	3	4

#### During the past 4 weeks:

Not at All   A Little   Quite a Bit   Very Much

For men only:

56. To what extent were you interested in sex?	1	2	3	4
57. Did you have difficulty getting or maintaining an erection?	1	2	3	4

For women only:

58. To what extent were you interested in sex?	1	2	3	4
59. Did you have pain or discomfort during intercourse?	1	2	3	4

b. EORTC QLQ-C30 – downloaded from <https://qol.eortc.org/questionnaire/eortc-qlq-c30/>

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**EORTC QLQ-C30 (version 3)**

We are interested in some things about you and your health. Please answer all of the questions yourself by circling the number that best applies to you. There are no "right" or "wrong" answers. The information that you provide will remain strictly confidential.

Please fill in your initials:

Your birthdate (Day, Month, Year):

Today's date (Day, Month, Year):

31

	Not at All	A Little	Quite a Bit	Very Much
1. Do you have any trouble doing strenuous activities, like carrying a heavy shopping bag or a suitcase?	1	2	3	4
2. Do you have any trouble taking a <u>long</u> walk?	1	2	3	4
3. Do you have any trouble taking a <u>short</u> walk outside of the house?	1	2	3	4
4. Do you need to stay in bed or a chair during the day?	1	2	3	4
5. Do you need help with eating, dressing, washing yourself or using the toilet?	1	2	3	4

**During the past week:**

	Not at All	A Little	Quite a Bit	Very Much
6. Were you limited in doing either your work or other daily activities?	1	2	3	4
7. Were you limited in pursuing your hobbies or other leisure time activities?	1	2	3	4
8. Were you short of breath?	1	2	3	4
9. Have you had pain?	1	2	3	4
10. Did you need to rest?	1	2	3	4
11. Have you had trouble sleeping?	1	2	3	4
12. Have you felt weak?	1	2	3	4
13. Have you lacked appetite?	1	2	3	4
14. Have you felt nauseated?	1	2	3	4
15. Have you vomited?	1	2	3	4
16. Have you been constipated?	1	2	3	4

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**During the past week:**

	Not at All	A Little	Quite a Bit	Very Much
17. Have you had diarrhea?	1	2	3	4
18. Were you tired?	1	2	3	4
19. Did pain interfere with your daily activities?	1	2	3	4
20. Have you had difficulty in concentrating on things, like reading a newspaper or watching television?	1	2	3	4
21. Did you feel tense?	1	2	3	4
22. Did you worry?	1	2	3	4
23. Did you feel irritable?	1	2	3	4
24. Did you feel depressed?	1	2	3	4
25. Have you had difficulty remembering things?	1	2	3	4
26. Has your physical condition or medical treatment interfered with your family life?	1	2	3	4
27. Has your physical condition or medical treatment interfered with your <u>social</u> activities?	1	2	3	4
28. Has your physical condition or medical treatment caused you financial difficulties?	1	2	3	4

**For the following questions please circle the number between 1 and 7 that best applies to you**

29. How would you rate your overall health during the past week?

1 2 3 4 5 6 7

Very poor Excellent


30. How would you rate your overall quality of life during the past week?

1 2 3 4 5 6 7


Very poor Excellent



c. SF-36 – downloaded from [https://www.rand.org/health-care/surveys\\_tools/mos/36-item-short-form.html](https://www.rand.org/health-care/surveys_tools/mos/36-item-short-form.html)



HEALTH



RAND > RAND Health > Surveys > RAND Medical Outcomes Study > 36-Item Short Form Survey (SF-36) >

## 36-Item Short Form Survey Instrument (SF-36)

### RAND 36-Item Health Survey 1.0 Questionnaire Items

Choose one option for each questionnaire item.

1. In general, would you say your health is:

☐ 1 - Excellent

☐ 2 - Very good

☐ 3 - Good

☐ 4 - Fair

☐ 5 - Poor

2. Compared to one year ago, how would you rate your health in general now?

☐ 1 - Much better now than one year ago

☐ 2 - Somewhat better now than one year ago

☐ 3 - About the same

☐ 4 - Somewhat worse now than one year ago

☐ 5 - Much worse now than one year ago

The following items are about activities you might do during a typical day. Does **your health now limit you** in these activities? If so, how much?

	Yes, limited a lot	Yes, limited a little	No, not limited at all
3. <b>Vigorous activities</b> , such as running, lifting heavy objects, participating in strenuous sports	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
4. <b>Moderate activities</b> , such as moving a table, pushing a vacuum cleaner, bowling, or playing golf	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
5. Lifting or carrying groceries	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
6. Climbing <b>several</b> flights of stairs	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
7. Climbing <b>one</b> flight of stairs	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
8. Bending, kneeling, or stooping	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
9. Walking <b>more than a mile</b>	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
10. Walking <b>several blocks</b>	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
11. Walking <b>one block</b>	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3
12. Bathing or dressing yourself	<input type="radio"/> 1	<input type="radio"/> 2	<input type="radio"/> 3

During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of your physical health**?

	Yes	No
13. Cut down the <b>amount of time</b> you spent on work or other activities	<input type="radio"/> 1	<input type="radio"/> 2
14. <b>Accomplished less</b> than you would like	<input type="radio"/> 1	<input type="radio"/> 2
15. Were limited in the <b>kind</b> of work or other activities	<input type="radio"/> 1	<input type="radio"/> 2
16. Had <b>difficulty</b> performing the work or other activities (for example, it took extra effort)	<input type="radio"/> 1	<input type="radio"/> 2

During the **past 4 weeks**, have you had any of the following problems with your work or other regular daily activities **as a result of any emotional problems** (such as feeling depressed or anxious)?

	Yes	No
17. Cut down the <b>amount of time</b> you spent on work or other activities	<input type="radio"/> 1	<input type="radio"/> 2
18. <b>Accomplished less</b> than you would like	<input type="radio"/> 1	<input type="radio"/> 2
19. Didn't do work or other activities as <b>carefully</b> as usual	<input type="radio"/> 1	<input type="radio"/> 2

20. During the **past 4 weeks**, to what extent has your physical health or emotional problems interfered with your normal social activities with family, friends, neighbors, or groups?

☐ 1 - Not at all

☐ 2 - Slightly

☐ 3 - Moderately

☐ 4 - Quite a bit

☐ 5 - Extremely

21. How much **bodily** pain have you had during the **past 4 weeks**?

- ☐ 1 - None
- ☐ 2 - Very mild
- ☐ 3 - Mild
- ☐ 4 - Moderate
- ☐ 5 - Severe
- ☐ 6 - Very severe

22. During the **past 4 weeks**, how much did **pain** interfere with your normal work (including both work outside the home and housework)?

- ☐ 1 - Not at all
- ☐ 2 - A little bit
- ☐ 3 - Moderately
- ☐ 4 - Quite a bit
- ☐ 5 - Extremely

These questions are about how you feel and how things have been with you **during the past 4 weeks**. For each question, please give the one answer that comes closest to the way you have been feeling.

How much of the time during the **past 4 weeks**...

- |   | All of the time         | Most of the time        | A good bit of the time  | Some of the time        | A little of the time    | None of the time        |
|---|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 23. Did you feel full of pep?   | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 | <input type="radio"/> 6 |
| 24. Have you been a very nervous person?                                | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 | <input type="radio"/> 6 |
| 25. Have you felt so down in the dumps that nothing could cheer you up? | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 | <input type="radio"/> 6 |
| 26. Have you felt calm and peaceful?                                    | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 | <input type="radio"/> 6 |
| 27. Did you have a lot of energy?                                       | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 | <input type="radio"/> 6 |
| 28. Have you felt downhearted and blue?                                 | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 | <input type="radio"/> 6 |
| 29. Did you feel worn out?  | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 | <input type="radio"/> 6 |
| 30. Have you been a happy person?                                       | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 | <input type="radio"/> 6 |
| 31. Did you feel tired?   | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 | <input type="radio"/> 6 |

32. During the **past 4 weeks**, how much of the time has **your physical health or emotional problems** interfered with your social activities (like visiting with friends, relatives, etc.)?

- ☐ 1 - All of the time
- ☐ 2 - Most of the time
- ☐ 3 - Some of the time
- ☐ 4 - A little of the time
- ☐ 5 - None of the time

How TRUE or FALSE is **each** of the following statements for you.

- |  | Definitely true         | Mostly true             | Don't know              | Mostly false            | Definitely false        |
|--|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|
| 33. I seem to get sick a little easier than other people | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 34. I am as healthy as anybody I know                    | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 35. I expect my health to get worse                      | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |
| 36. My health is excellent                               | <input type="radio"/> 1 | <input type="radio"/> 2 | <input type="radio"/> 3 | <input type="radio"/> 4 | <input type="radio"/> 5 |

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d. FIQL – downloaded from [https://patientreportedoutcomes2.sites.olt.ubc.ca/files/2014/04/Fecal\\_Incontinence\\_Quality\\_of\\_Life\\_Paper.pdf](https://patientreportedoutcomes2.sites.olt.ubc.ca/files/2014/04/Fecal_Incontinence_Quality_of_Life_Paper.pdf)

Q 1: In general, would you say your health is:

- 1 ☐ Excellent  
 2 ☐ Very Good  
 3 ☐ Good  
 4 ☐ Fair  
 5 ☐ Poor

Q 2: For each of the items, please indicate how much of the time the issue is a concern for you due to accidental bowel leakage. (If it is a concern for you for reasons other than accidental bowel leakage then check the box under Not Apply, (N/A).)

Q2. Due to accidental bowel leakage:	Most of the Time	Some of The Time	A Little of the Time	None of the Time	N/A
a. I am afraid to go out	1	2	3	4	<input type="checkbox"/>
b. I avoid visiting friends	1	2	3	4	<input type="checkbox"/>
c. I avoid staying overnight away from home	1	2	3	4	<input type="checkbox"/>
d. It is difficult for me to get out and do things like going to a movie or to church	1	2	3	4	<input type="checkbox"/>
e. I cut down on how much I eat before I go out	1	2	3	4	<input type="checkbox"/>
f. Whenever I am away from home, I try to stay near a restroom as much as possible	1	2	3	4	<input type="checkbox"/>
g. It is important to plan my schedule (daily activities) around my bowel pattern	1	2	3	4	<input type="checkbox"/>
h. I avoid traveling	1	2	3	4	<input type="checkbox"/>
i. I worry about not being able to get to the toilet in time	1	2	3	4	<input type="checkbox"/>
j. I feel I have no control over my bowels	1	2	3	4	<input type="checkbox"/>
k. I can't hold my bowel movement long enough to get to the bathroom	1	2	3	4	<input type="checkbox"/>
l. I leak stool without even knowing it	1	2	3	4	<input type="checkbox"/>
m. I try to prevent bowel accidents by staying very near a bathroom	1	2	3	4	<input type="checkbox"/>

Q 3: Due to accidental bowel leakage, indicate the extent to which you AGREE or DISAGREE with each of the following items. (If it is a concern for you for reasons other than accidental bowel leakage then check the box under Not Apply, N/A).

Q3. Due to accidental bowel leakage:	Strongly Agree	Somewhat Agree	Somewhat Disagree	Strongly Disagree	N/A
a. I feel ashamed	1	2	3	4	<input type="checkbox"/>
b. I can not do many of things I want to do	1	2	3	4	<input type="checkbox"/>
c. I worry about bowel accidents	1	2	3	4	<input type="checkbox"/>
d. I feel depressed	1	2	3	4	<input type="checkbox"/>
e. I worry about others smelling stool on me	1	2	3	4	<input type="checkbox"/>
f. I feel like I am not a healthy person	1	2	3	4	<input type="checkbox"/>
g. I enjoy life less	1	2	3	4	<input type="checkbox"/>
h. I have sex less often than I would like to	1	2	3	4	<input type="checkbox"/>
i. I feel different from other people	1	2	3	4	<input type="checkbox"/>
j. The possibility of bowel accidents is always on my mind	1	2	3	4	<input type="checkbox"/>
k. I am afraid to have sex	1	2	3	4	<input type="checkbox"/>
l. I avoid traveling by plane or train	1	2	3	4	<input type="checkbox"/>
m. I avoid going out to eat	1	2	3	4	<input type="checkbox"/>
n. Whenever I go someplace new, I specifically locate where the bathrooms are	1	2	3	4	<input type="checkbox"/>

Q 4: During the past month, have you felt so sad, discouraged, hopeless, or had so many problems that you wondered if anything was worthwhile?

- 1 ☐ Extremely So - To the point that I have just about given up  
 2 ☐ Very Much So  
 3 ☐ Quite a Bit  
 4 ☐ Some - Enough to bother me  
 5 ☐ A Little Bit  
 6 ☐ Not At All

#### Scale Scoring

Scales range from 1 to 5, with a 1 indicating a lower functional status of quality of life. Scale scores are the average (mean) response to all items in the scale (e.g., add the responses to all questions in a scale together and then divide by the number of items in the scale. Not Apply is coded as a missing value in the analysis for all questions.)

Scale 1. Lifestyle, ten items: Q2a Q2b Q2c Q2d Q2e Q2g Q2h Q3b Q3l Q3m

Scale 2. Coping/Behavior, nine items: Q2f Q2l Q2j Q2k Q2m Q3d Q3h Q3j Q3n

Scale 3. Depression/Self Perception, seven items: Q1 Q3d Q3f Q3g Q3i Q3k Q4, (Question 1 is reverse coded.)

Scale 4. Embarrassment, three items: Q2l Q3a Q3e

### S5. Links to questionnaires used in only one study

- Cleveland Global QoL: [https://cdn-links.lww.com/permalink/ibd/b/ibd\\_2015\\_07\\_09\\_shen\\_15-0060\\_sdc1.pdf](https://cdn-links.lww.com/permalink/ibd/b/ibd_2015_07_09_shen_15-0060_sdc1.pdf)
- EORTC IN – PATSAT32: <https://www.eortc.org/app/uploads/sites/2/2018/08/Specimen-IN-PATSAT32-English.pdf>
- Gastrointestinal Quality of Life Index: <https://patientreportedoutcomes2.sites.olt.ubc.ca/files/2014/04/GQLI.pdf>
- EuroQoL visual analogue scale: <https://euroqol.org/eq-5d-instruments/eq-5d-5l-about/>
- Short-Form 12: [https://www.rand.org/health-care/surveys\\_tools/mos/12-item-short-form.html](https://www.rand.org/health-care/surveys_tools/mos/12-item-short-form.html)
- Rotterdam Symptoms Check List questionnaire (RSCL): <https://meetinstrumentenzorg.nl/wp-content/uploads/instrumenten/RSCL-handl.pdf>

## S6. Additional reported outcomes

[illegible]

<b>Hain et al.</b>	Everyone	/	35 (76) : 61 (69) radiotherapy	0.36*	5.4 : 6.1	0.33*	Intersphincteric resection 17 (37) : 30 (34)	0.71*	NA	/	NA	NA	NA
<b>van Kooten et al.</b>	NA	/	NA	/	NA	/	NA	/	NA	/	Not AL specific	/	NA
<b>Lim et al.</b>	NA	/	Comparison between SCL and CL chemotherapy and radiotherapy	NS	NA	/	NA	/	NA	/	6 CL : 0 SCL	/	NA
<b>Marinatou et al.</b>	13 (52) : 18 (36)	0.28	12 (48) : 38 (76) chemo±radiotherapy	0.03	5.3 : 5.7	0.5	NA	/	NA	/	- 3 months 21 (84) : 13 (26) - 6 months 20 (80) : 12 (24), - 12 months 13 (52) : 1 (2)	0.0001 0.0001 0.0001	NA
<b>McGiffin et al.</b>	Exclusion criterium	/	NA	/	10 : 12	<b>0.011</b>	PME 5 (21) : 123 (61.5); TME 19 (79) : 77 (38.5)	<b>&lt;0.001</b>	NA	/	NA	/	NA
<b>Miura et al.</b>	Exclusion criterium	/	NA	/	NA	/	NA	/	NA	/	Permanent stoma formation rate was 16.7% for AL	/	NA
<b>Mongin et al.</b>	NA	/	17 (81) : 26 (62) radiotherapy	0.158	NA	/	Intersphincteric resection 10 (48) : 19 (45)	0.858	NA	/	all patients who still had a stoma after AL were excluded	/	NA

<b>di Re et al.</b>	24 (39.3) : 23 (37.7) 0.900	14 (23.0) : 14 (23.0) radiotherapy > 0.999	- High 12 (19.7) : 14 (23.0) - low 18 (29.5) : 17 (27.9) - ultra low 1 (50.8) : 30 (49.2)	0.900	NA /	NA /	NA /	Disease free survival at 1, 3 and 5 years NS
<b>Riss et al.</b>	12 (75) : 8 (67) 0.0455	11 (68.8) : 9 (56.3) (chemo)radiotherapy NS	NA /		Same distribution of isersphincteric, Low anterior and complete NA /	NS	NA /	NA
<b>Westerduin et al.</b>	37 (71) : 82 (69) 0.83	29 (56) : 55 (47) chemotherapy 0.27 43 (83) : 68 (58) radiotherapy 0.001	NA /		NA /		Temporary stoma formation in 87% of AL group /	NA

*AL, anastomotic leakage; SCL, subclinical leak; CL, clinical leak; NS, not significant. \*also not significant when subgroup analysis for symptomatic and non-symptomatic AL.*