

# LARS following rectal resection for cancer

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# LARS following rectal cancer resection Introduction



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## LARS?





# LARS following rectal cancer resection

## Introduction



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## Overview

### Today's presentation

- ✓ Definition & scoring of LARS
- ✓ Prevalence pre- and postop
- ✓ Perception of surgeons & nurses
- ✓ Risk factors & modifiers
- ✓ Prevention and therapy





## What is LARS?

«low anterior resection syndrome»



## What is LARS?

«low anterior resection syndrome»

No uniform definition exists.

However, there is a LARS score.

Prerequisite: Patient must have undergone a low anterior resection



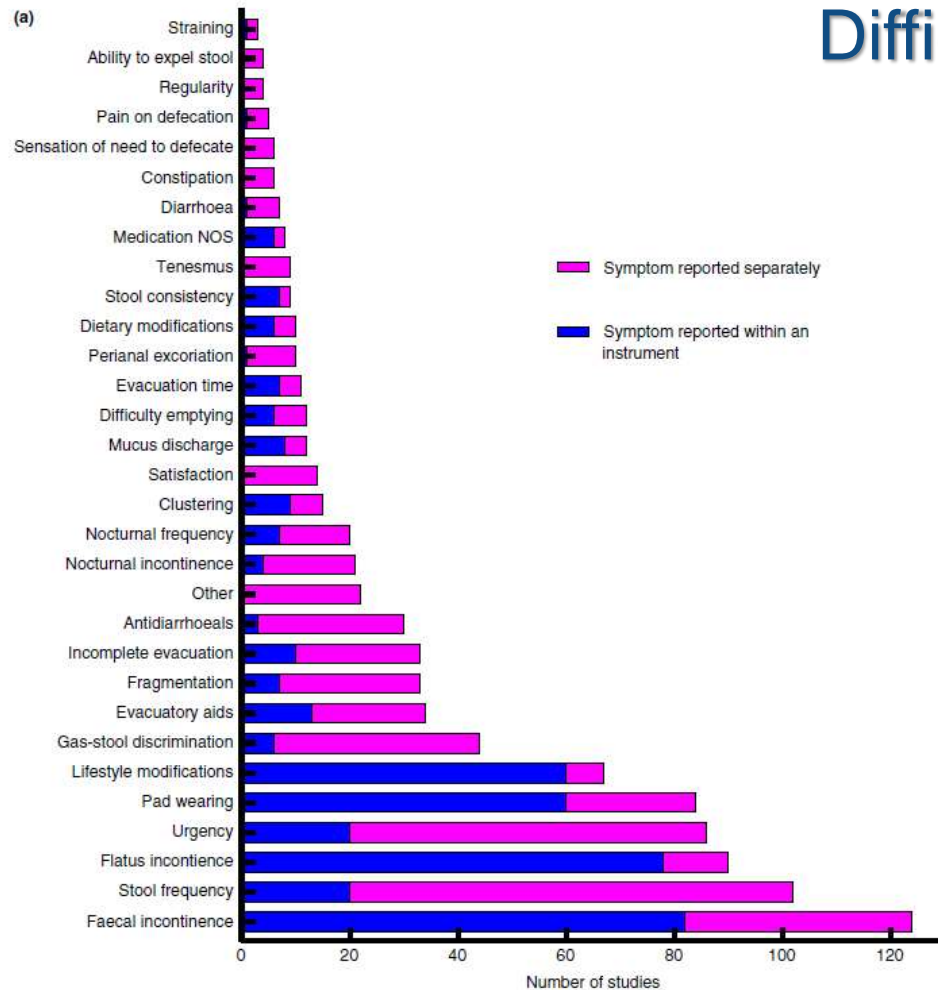
Everybody lies.

a doctor who holds your hand while  
Unfortunately, grant them the greatest re  
or one who ignores you while you get  
When a baby is born, it's perfect. I am both amused and annoyed  
I suppose it would be a good idea to  
period. I'm sure you think I should be less stubborn than yo  
Then it's a doctor who ignores you while  
Parents get a good guy. He's probably a great  
They'll annoy you with. Probably a much better guy than I am.  
No problem. And some part of me wants him to die.  
Help. I'm just not sure if it's because I want to be val  
and tell you what a horror it's because I want her to suffer.  
If you talk to God you're dead. If you don't talk to  
If God talks to you, you're dead. The eyes can mislead  
The smile can lie,  
but the shoes always tell the truth.  
He figures out what's going o  
And they're all grown up and they're  
Well here's the law in your argument  
If I enjoy eating life, I don't hate life. I  
Come out of your mind, people. I  
Yeah, I want to save her. That's morally bank  
have flesh-eating bacteria. It's just wrong.  
let's cure her. I'm not sure if it's a package  
People finding out that your son's a perv. That's pretty f  
Cute kids like to see you all the time. I'm not sure if  
Perseverance is the key to success. I'm not sure if  
As fast as a kid can turn a page of paper, I can turn a  
Everybody does stupid things. I for sound by  
Back to work. I don't do what's  
If shouldn't cost them everything they w  
Get out of my office. Sometimes the best gift  
about who's the bigger weaking





## Difficulty of defining LARS



### Variety of symptoms recorded

- Fecal incontinence most widely reported
- Stool frequency & fragmentation
- Urgency – checking for location of nearby toilets
- Incomplete evacuation
- Difficulty emptying
- Mucuous discharge
- Time needed to defacate ↑
- Other aspects of QOL frequently omitted
- *Consensus definition required*

**Figure 3** (a) Outcome measures reported (NOS, not otherwise specified; 'Other' includes perianal soreness, type of evacuation, dyschezia, anal pain not during defaecation, flatulence, pelvic pain, anal bleeding, anal mucus loss, mean toilet time per day, need for care, preference for stoma). (b) Outcome measures used to assess quality of life or behaviour change (QoL, quality of life). (c) Follow-up time period reported (months, year).

# LARS following rectal cancer resection

## Definition



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## The LARS score

### Symptom-based score

- Patient-recorded
- Incontinence, frequency, fragmentation, urgency
- Score 0 (no LARS) to 42 (max LARS)

- 0-20 = **No LARS**
- 21-29 = **Minor LARS**
- 30-42 = **Major LARS**

The aim of this questionnaire is to assess your bowel function. Please tick only one box for each question. It may be difficult to select only one answer, as we know that for some patients symptoms vary from day to day. We would kindly ask you to choose one answer which best describes your daily life. If you have recently had an infection affecting your bowel function, please do not take this into account and focus on answering questions to reflect your usual daily bowel function.

**Q.1 : Do you ever have occasions when you cannot control your flatus (wind)?**

- No, never 0
- Yes, less than once per week 4
- Yes, at least once per week 7

**Q.2 : Do you ever have any accidental leakage of liquid stool?**

- No, never 0
- Yes, less than once per week 3
- Yes, at least once per week 3

**Q.3 : How often do you open your bowels?**

- More than 7 times per day (24 hours) 4
- 4-7 times per day (24 hours) 2
- 1-3 times per day (24 hours) 0
- Less than once per day (24 hours) 5

**Q.4 : Do you ever have to open your bowels again within one hour of the last bowel opening?**

- No, never 0
- Yes, less than once per week 9
- Yes, at least once per week 11

**Q.5 : Do you ever have such a strong urge to open your bowels that you have to rush to the toilet?**

- No, never 0
- Yes, less than once per week 11
- Yes, at least once per week 16

Add the scores from each of the five answers to one final score.

**Interpretation:** 0-20 = No LARS 21-29 = Minor LARS 30-42 = Major LARS



## The LARS score

### Symptom-based score

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- 30-42 = **Major** LARS

## Score-derived definition of LARS

«Combination of symptoms related to disturbed defecation typically observed in patients after low anterior resection. Symptoms typically include impaired fecal continence, increased urgency, frequency and fragmentation of bowel movements.»

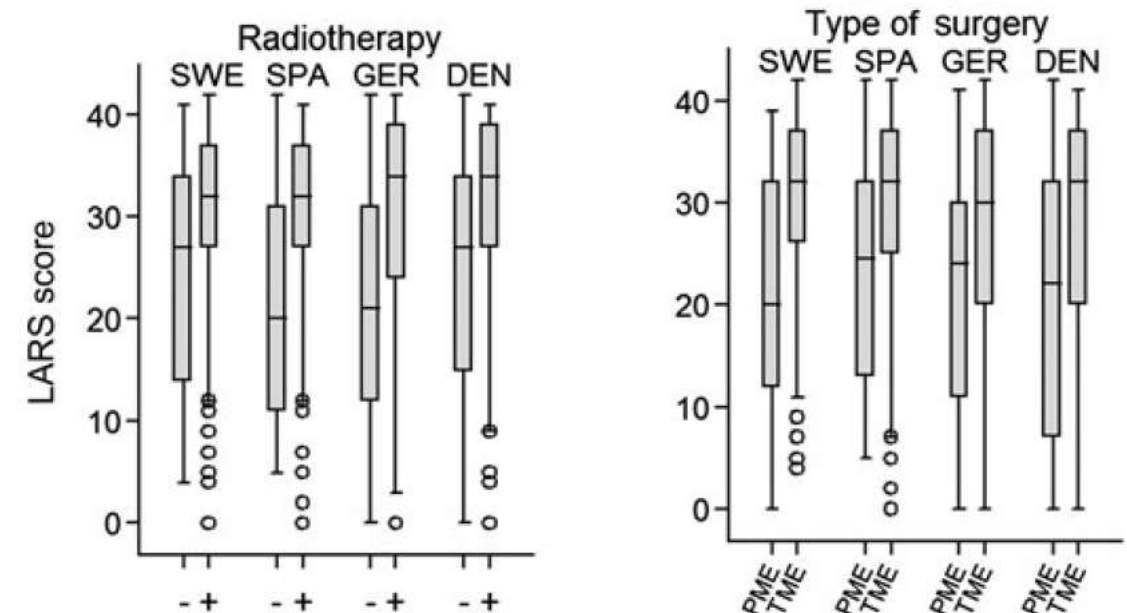
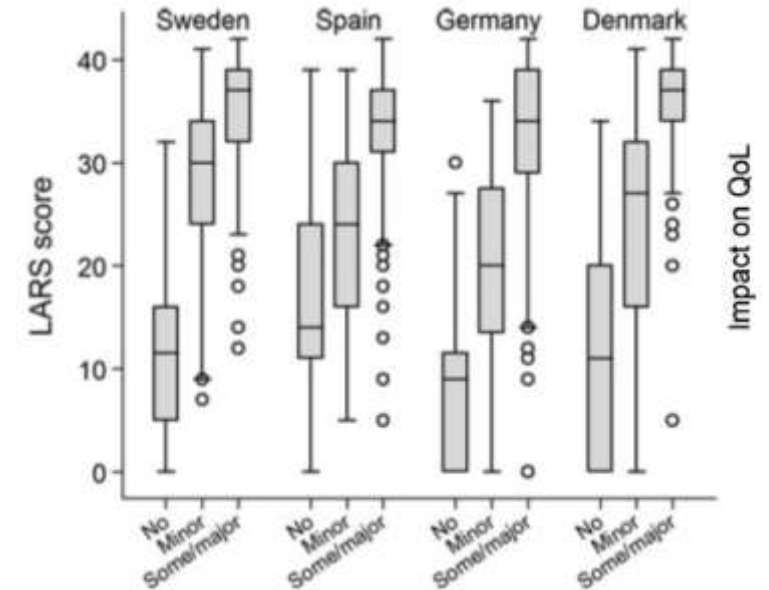




## LARS score – International Validation

### Validation in 4 European patient populations

- Sweden, Spain, Germany, Denmark
- 801 patients included
- High correlation LARS - QoL
- Discrimination for radiotherapy, age, type of surgery (PME vs TME)
- High reliability at retest





## Surgeon- and nurse-estimated prevalence of LARS

*What percentage of patients undergoing LAR suffers from LARS postoperatively?*



# LARS following rectal cancer resection

## Prevalence

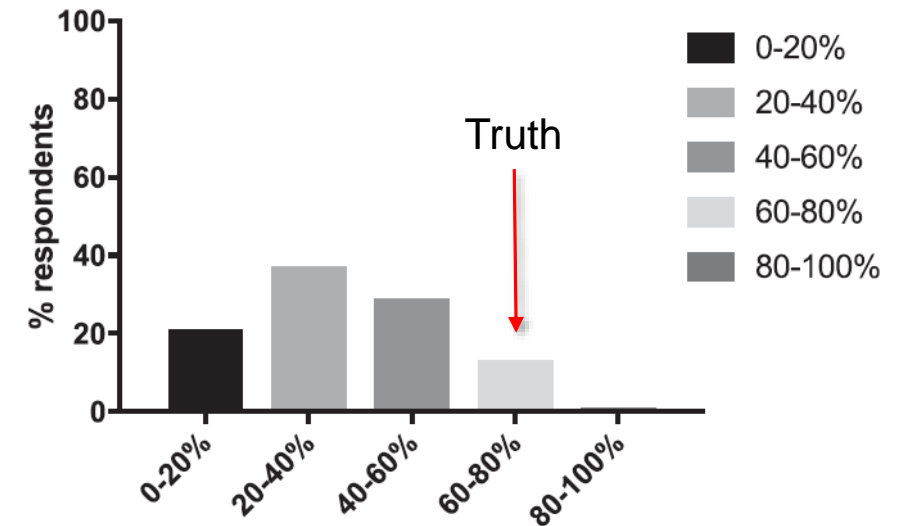


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## Surgeon- and nurse-estimated prevalence of LARS

### Dutch national survey of colorectal surgeons and nurses

- 242 HC professionals queried
- **Estimated prevalence 20-40%**
- Only 10% of surgeons use LARS screening tools preop
- Less than 50% ever use LARS scores
- Consensus that more counselling would be better







## Prevalence of LARS

### Meta-analysis

- 11 studies included, mostly Denmark and United Kingdom
- Radiotherapy and tumor height as most significant predictors
- Diverting ileostomy less significant

A meta-analysis of the prevalence of Low Anterior Resection Syndrome and systematic review of risk factors

Alexander D. Croese<sup>a,\*</sup>, James M. Lonie<sup>a</sup>, Alexandra F. Trollope<sup>b</sup>, Venkat N. Vangaveti<sup>b</sup>, Yik-Hong Ho<sup>b</sup>

**Table 4**

Meta-analysis results of LARS score prevalence.

	Major LARS	Minor LARS	No LARS
Prevalence	41%	24%	35%

Overall prevalence of LARS = 65%

2/3

## Prevalence of LARS

What about pre-operative function?



# LARS following rectal cancer resection

## Prevalence



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## LARS without rectal resection?

### Normative Data for the Low Anterior Resection Syndrome Score (LARS Score)

Therese Juul, MHS, PhD,\* Hossam Elfeki, MD, MSc,\*† Peter Christensen, PhD, DMSc,\*  
 Søren Laurberg, MD, PhD, DMSc,\* Katrine J. Emmertsen, MD, PhD,\*‡ and Palle Bager, MPH, PhD§

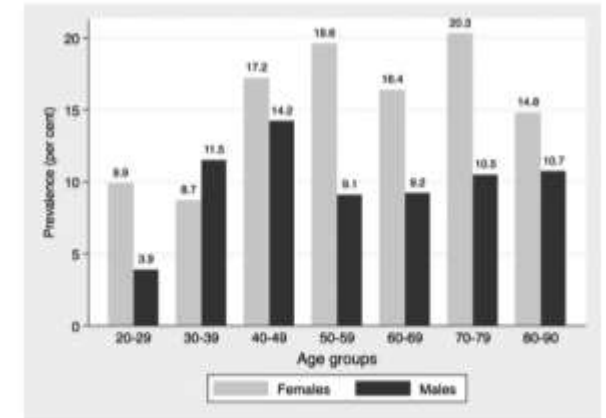


FIGURE 2. Prevalence of "major LARS" (LARS score  $\geq 30$ ) in the Danish general population, by age and gender.

## LARS in healthy individuals

- 15% of population has *major LARS*
- Age- and gender-dependent (Peak age 60-80)
- Therefore: LARS overestimated in studied on postop patients
- In some, LARS not necessarily  $\neq$  QOL postop ↓

TABLE 2. Results of the Univariate and Multivariate Analyses

	Major LARS		Univariate Analysis		Multivariate Analysis		
	N (%)	P*	OR (95% CI)	P	OR (95% CI)	P	
Age groups	<50 yrs	96 (11.3)	0.260	Ref.	0.102	1.1 (0.8–1.5)	0.396
	50–79 yrs	114 (14.0)					
Sex	Male	85 (9.8)	0.001	Ref.	0.001	1.6 (1.2–2.2)	0.001
	Female	151 (14.9)		1.6 (1.2–2.1)			
Physical disease	No	119 (9.6)	<0.0001	Ref.	<0.001	2.2 (1.6–2.9)	<0.001
	yes	117 (18.6)					

Major LARS versus no/major LARS is the binary outcome.  
 \*Pearson chi-square test.

TABLE 3. Proportion of Major LARS and Mean/median Score, by Gender and Age Group

Age, yrs	Females			Males		
	Major LARS	Mean (SD)	Median (IQR)	Major LARS	Mean (SD)	Median (IQR)
<50	12.2%	14.5 (11.3)	13 (4–24)	10.0%	14.1 (10.7)	13 (5–23)
50–79	18.8%	16.7 (11.6)	16 (7–26)	9.6%	13.7 (10.9)	11 (4–22)
>79	14.8%	16.3 (11.9)	17 (7–27)	10.7%	14.6 (11.1)	14 (5–23)
All	15.0%	15.5 (11.5)	15 (5–24)	9.9%	14.0 (10.9)	12 (5–23)



# LARS following rectal cancer resection

## Prevalence

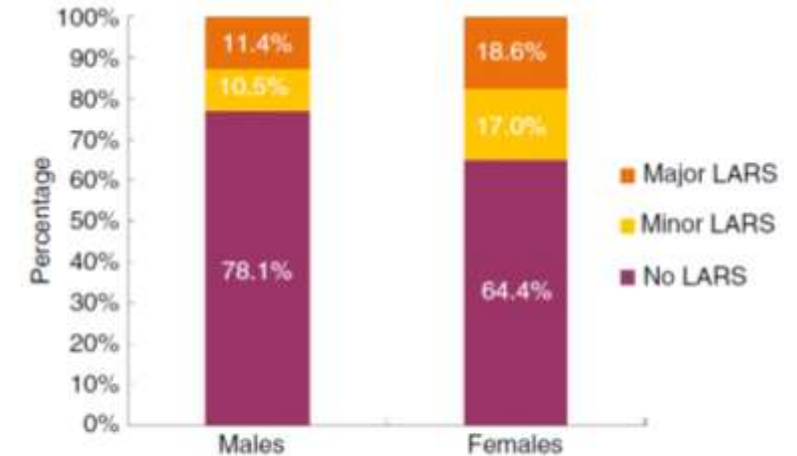


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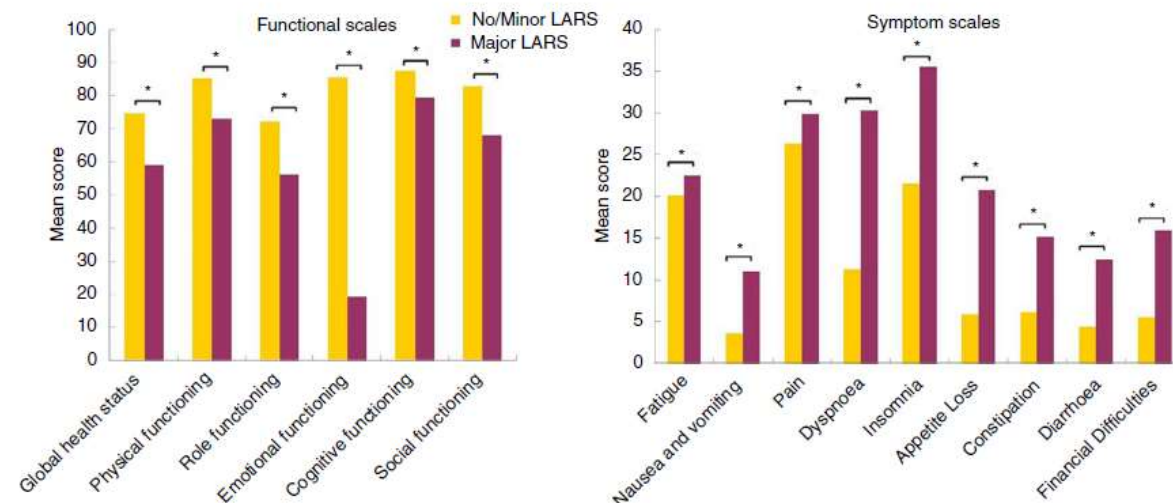
## LARS without rectal resection?

### Prevalence in healthy Dutch population

- 501 respondents to mail questionnaire
- Median age 68 yrs, 47% male
- Major LARS in 15%
- Women with morge urgency ( $P=0.07$ ) and incontinence for flatus ( $P<0.001$ ) and stool ( $P=0.063$ )
- Women with more LARS (OR 1.8, CI 1.1-3.0)
- Marital status no factor (!)



**Figure 1** LARS score severity categories among men and women.





## Risk factors for LARS

### Cross-sectional study

- 186 patients with LAR
- Pt questionnaires
- Partial vs **total mesorectal excision**
- **Diverting ileostomy** (LARS ↑)
- **Radiotherapy** (pre- or postop)
- **Chemotherapy** (postop)

Factors associated with low anterior resection syndrome after surgical treatment of rectal cancer

L. M. Jimenez-Gomez<sup>1</sup>, E. Espin-Basany<sup>2</sup>, L. Trenti<sup>3</sup>, M. Marti-Gallostra<sup>4</sup>, J. L. Sánchez-García<sup>5</sup>, F. Vallribera-Valls<sup>6</sup>, E. Kreisler<sup>7</sup>, S. Biondo<sup>8</sup> and M. Armengol-Carrasco<sup>9</sup>

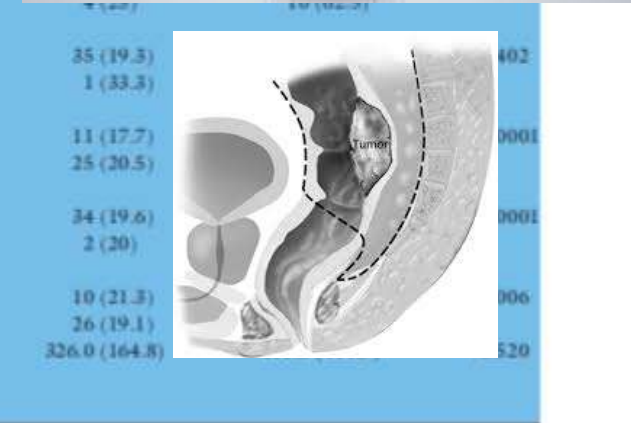
	LARS questionnaire	
	No LARS	LARS
Total (%)	(0-20 score), no. (%)	(21-40 score), no. (%)

Table 3 Results of multivariate analysis.

	Odds ratio (95% confidence interval)	P value
Radiotherapy		
No	1	0.0003
Preoperative	4.33 (2.03-9.27)	
Postoperative	9.52 (1.74-52.24)	
Mesorectal excision		
Partial	1	0.043
Total	2.18 (1.02-4.65)	
Age	0.97 (0.94-1.0)	0.054

Postoperative chemotherapy*	No	Yes
No	47 (25.7)	19 (40.4)
Yes	136 (74.3)	23 (18.4)
Time interval from creation to closure of the ileostomy, days, mean (SD)	376.1 (350.8)	301.6 (149.4)

Data expressed as number of patients and percentages in parenthesis unless otherwise stated.  
 \*Missing data for one patient.



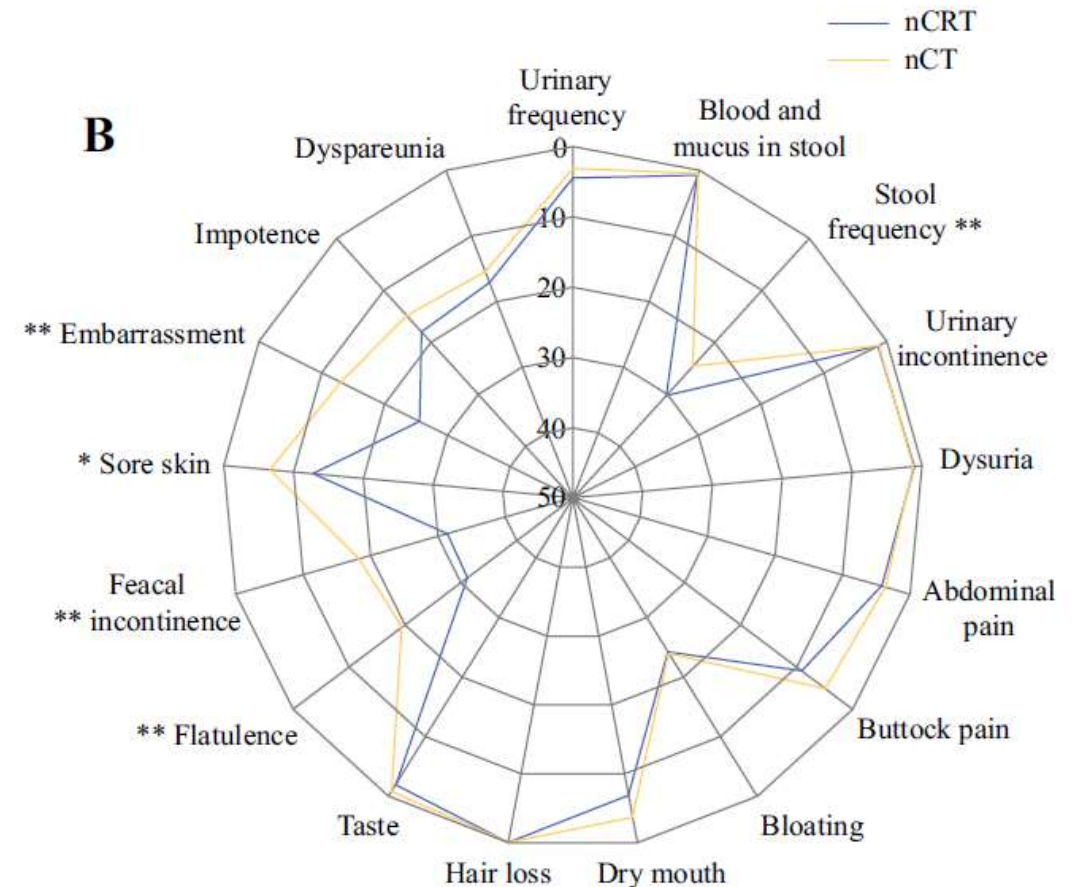


## Chemoradiation

### Effect of neoadjuvant long-course CRT

- Post-hoc analysis of FOWARC RCT
- Neoadjuvant CRT vs Chemo alone
- *Long-course neoadjuvant chemoradiation as independent risk factor for postoperative bowel function and QOL*
- Other factors: Height of anastomosis, diverting ostomy

### Impact of Long-Course Neoadjuvant Radiation on Postoperative Low Anterior Resection Syndrome and Quality of Life in Rectal Cancer: Post Hoc Analysis of a Randomized Controlled Trial







## How to treat LARS?



## Treatment options

### List of options

- Heterogenous options
- Insufficiently studied
- Not always accepted by pts
- Efficacy hard to predict

**Table 6** Comparative table of all treatment modalities for low anterior resection syndrome

Treatment modality	Positive factors	Negative factors
Pelvic floor training	Cheap Possible to do at home Possibly good effect Non-invasive Nonmedicinal	Time-consuming—many sessions needed No prospective randomized trials
Biofeedback	Simple procedure Good long-lasting effect Non-medicinal	Unpleasant for the patient Time-consuming—many sessions needed Needs special equipment No prospective randomized trials
Retrograde irrigation	Simple/easy to learn Pseudo-continenence Good effect	Retrograde irrigation Pseudo-continenence
Sacral nerve stimulation	Good effect to anorectal function Good effect to urinary function as well	Needs special equipment Surgical intervention under local anesthesia with possible complications Expensive Adverse effect to implant No prospective randomized trials
Tibial nerve stimulation	Good effect to anorectal function Good effect to urinary function as well	Needs special equipment Surgical intervention under local anesthesia with possible complications Expensive Adverse effect to implant No prospective randomized trials
Probiotics	Simple	Not effective Expensive



## Preferred treatment (questionnaire)

### Expert surgeon questionnaire

- Nonspecific measures in 60%
- Advanced measures (irrigation/SNS): 1-4.5%
- Effective treatment modalities for advanced LARS not utilized in >90%

	ASCRS surgeons (%)	Spanish surgeons (%)
What is your preferred treatment for low anterior resection syndrome rectal?		
Responders, no. (%)	248 (72.1 %)	150 (100 %)
Lifestyle and dietary measures WITH drug treatment	48,8	40,7
Lifestyle and dietary measures WITHOUT drug treatment	12,8	41,3
Drug treatment only	9,1	3,3
Biofeedback	8,3	10,0
I do not use any	6,2	2,7
Transanal irrigation	3,7	1,3
Sacral nerve stimulation	0,8	0
Other options	10,3	0,7



# LARS following rectal cancer resection

## Treatment – transanal irrigation



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### Acceptability and benefit of rectal irrigation in patients with low anterior resection syndrome: a qualitative study

G. M. McCutchan\*, D. Hughes†, Z. Davies†, J. Torkington†, C. Morris†, and J. A. Cornish‡ on behalf of the LARRIS Trial Management Group§

\*School of Medicine, Cardiff University, †University Hospital of Wales, Cardiff, and ‡Royal Glamorgan Hospital, Llantrisant, UK



	Treatment group (Peristeen use) (n = 15)	Comparator group (usual care) (n = 6)
Gender		
Male, n (%)	14 (93%)	4 (67%)
Female, n (%)	1 (7%)	2 (33%)
Age (years)		
Mean (range)	65 (36–79)	60 (46–71)
Severity of symptoms		
Major LARS (LARS score > 30), n (%)	13 (87%)	6 (100%)
Minor LARS (LARS score 21–29), n (%)	2 (13%)	0
Loperamide use		
Regular use of loperamide, n (%)	4 (27%)	4 (67%)
No regular use of loperamide, n (%)	11 (73%)	2 (33%)
Spinal conditions		
Chronic spinal condition, n (%)	3 (20%)	1 (17%)
No spinal condition, n (%)	12 (80%)	5 (83%)
LARS score		
Baseline, mean (range)	35.93 (21–42)	34.17 (32–37)
Six-month follow-up, mean (range)	17.73 (0–41)	32.35 (26–37)
St Marks score		
Baseline, mean (range)	9.73 (2–15)	9.33 (4–13)
Six-month follow-up, mean (range)	3.20 (0–9)	5.40 (0–9)

### Peristeen irrigation 30-45' daily

- Well accepted by pts with advanced sx
- Decrease in LARS score following 6 months
- Improvements in St. Marks score
- «life changing», «I have my life back!»
- Decrease in urgency
- Timing of defecation ↑↑



## Transanal irrigation

### RCT, Irrigation vs supportive tx

- Diet, biofeedback, loperamide as control
- F/u 1wk, 1mo, 3mo
- Sig improvement after 1mo TAI
- 3 vs 7 BM/day
- LARS score improved  
(16 vs 31 at 1mo, 9 vs 31 at 3mo)
- **Prophylactic TAI highly effective!**

### Randomized clinical trial of prophylactic transanal irrigation *versus* supportive therapy to prevent symptoms of low anterior resection syndrome after rectal resection

H. R. Rosen<sup>1</sup>, W. Kneist<sup>3</sup>, A. Fürst<sup>4</sup>, G. Krämer<sup>4</sup>, J. Hebenstreit<sup>2</sup> and J. F. Schiemer<sup>3</sup>

	TAI (n = 18)	Control (n = 19)
Age (years)*	58.5 (52–70)	58 (42–80)
Sex ratio (M:F)	12:6	5:14
Height of anastomosis above dentate line (cm)*	3 (2–5)	3.5 (2–5)
Preoperative radiation	15	14
Reconstruction type		
Pouch	6	4
Straight anastomosis	12	15

\*Values are median (range). TAI, transanal irrigation.

	TAI	Control	P*
1 week			
Maximum no. of defaecations/day	10 (3–34)	4 (2–20)	0.004
Maximum no. of defaecations/night	3 (0–8)	2 (2–20)	0.757
Wexner score	7.5 (0–20)	10 (0–20)	0.238
SF-36® mental component	48 (29–57)	55 (29–63)	0.543
SF-36® physical component	42 (19–54)	34.5 (29–58)	0.965
LARS score	37.5 (4–42)	32 (3–41)	0.177
1 month			
Maximum no. of defaecations/day	3 (1–10)	7 (3–30)	0.003
Maximum no. of defaecations/night	0 (0–6)	3 (0–6)	0.001
Wexner score	4 (0–17)	10 (0–17)	0.087
SF-36® mental component	51 (28–59)	55 (29–60)	0.195
SF-36® physical component	44 (35–55)	49 (20–58)	0.356
LARS score	16 (4–39)	32 (2–41)	0.044
3 months			
Maximum no. of defaecations/day	3 (1–10)	5 (3–12)	0.006
Maximum no. of defaecations/night	0 (0–2)	1 (1–5)	0.002
Wexner score	2 (0–11)	6 (0–17)	0.046
SF-36® mental component	55 (31–60)	57 (26–63)	0.436
SF-36® physical component	50 (39–64)	51 (37–61)	0.741
LARS score	9 (0–34)	31 (3–42)	0.001

Values are median (range). TAI, transanal irrigation; SF, Short Form; LARS, low anterior resection syndrome. \*Mann-Whitney U test.



## Sacral neuromodulation



Sacral nerve stimulation can be an effective treatment for low anterior resection syndrome

S. M. Eftaiha\*, B. Balachandran†, S. J. Marecik\*†‡, A. Mellgren\*, J. Nordenstam\*, G. Melich§, L. M. Prasad\*‡ and J. J. Park†‡

\*Division of Colon and Rectal Surgery, University of Illinois, Chicago, Illinois, USA, †Chicago Medical School, Rosalind Franklin University of Medicine and Science, North Chicago, Illinois, USA, ‡Division of Colon and Rectal Surgery, Advocate Lutheran General Hospital, Park Ridge, Illinois, USA, and §Department of General Surgery, Royal Columbian Hospital, University of British Columbia, New Westminster, BC, Canada

## Small clinical studies

- SNM not as first-line tx
- Effect on clustering & urgency most pronounced
- Less effective on incontinence
- **Patient selection is crucial!**

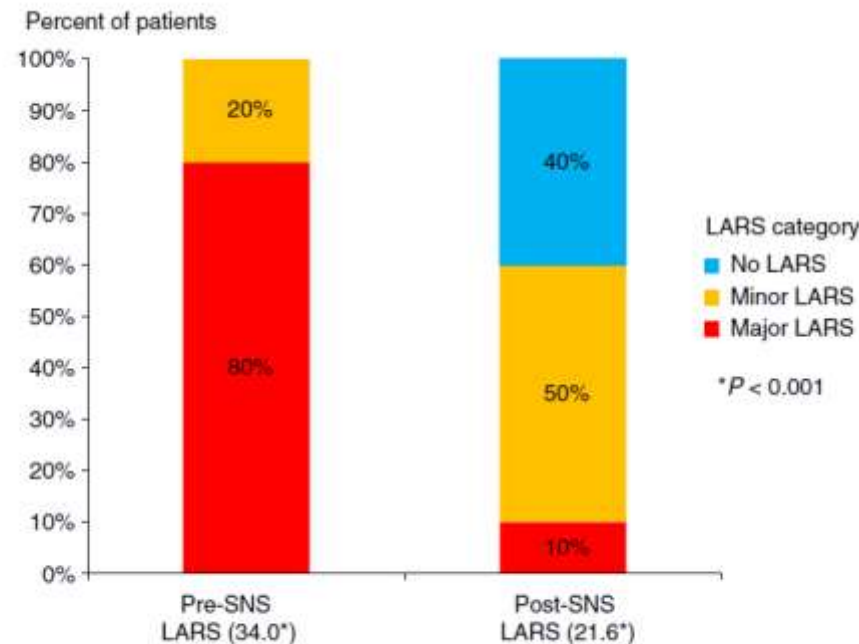


Figure 1 Mean LARS score pre- and post-SNS. Percentages of patients in each LARS category before and after treatment

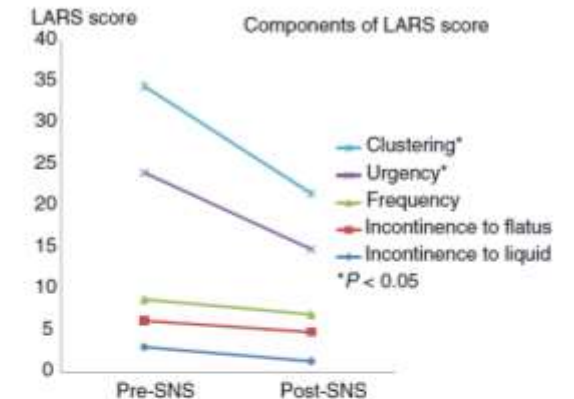


Figure 2 Components of LARS score pre- and post-SNS.

Table 4 Pre- and post-SNS CCISs and LARS scores.

Scale	Pre-SNS mean score (SD)	Post-SNS mean score (SD)
LARS score*	34.0 (±5.6)	21.6 (±6.8)
CCIS*	18.3 (±2.0)	4.0 (±4.7)

\*P < 0.001.



# LARS following rectal cancer resection

## Treatment



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## Sacral neuromodulation



## Systematic review, meta-analysis

- Effective on CC fecal incontinence and LARS score

Systematic review

doi:10.1111/codi.14690

## Sacral nerve stimulation for bowel dysfunction following low anterior resection: a systematic review and meta-analysis

Y. Huang\*†‡ and C. E. Koh\*†‡

\*SOuRCe (Surgical Outcomes Research Centre), Royal Prince Alfred Hospital, Camperdown, New South Wales, Australia, †Department of Colorectal Surgery, Royal Prince Alfred Hospital, Camperdown, New South Wales, Australia, and ‡RPA Institute of Academic Surgery, Royal Prince Alfred Hospital, Camperdown, New South Wales, Australia.

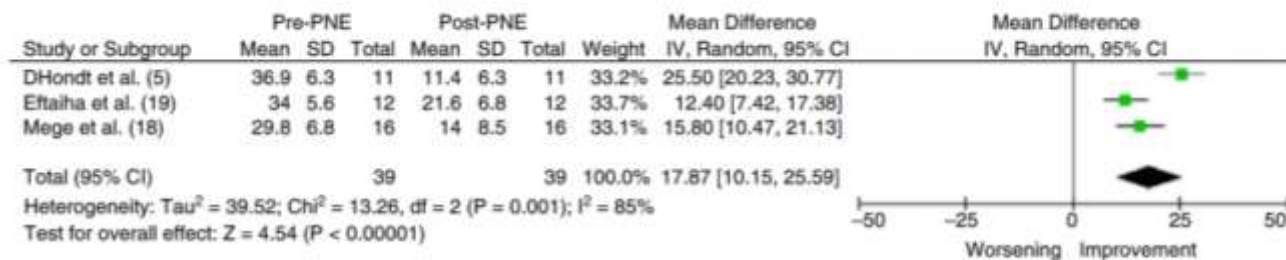


Figure 3 Low anterior resection syndrome scoring system.

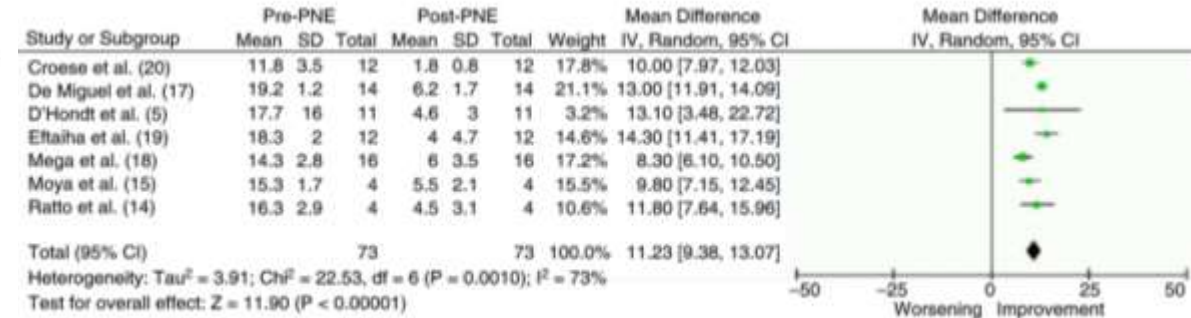


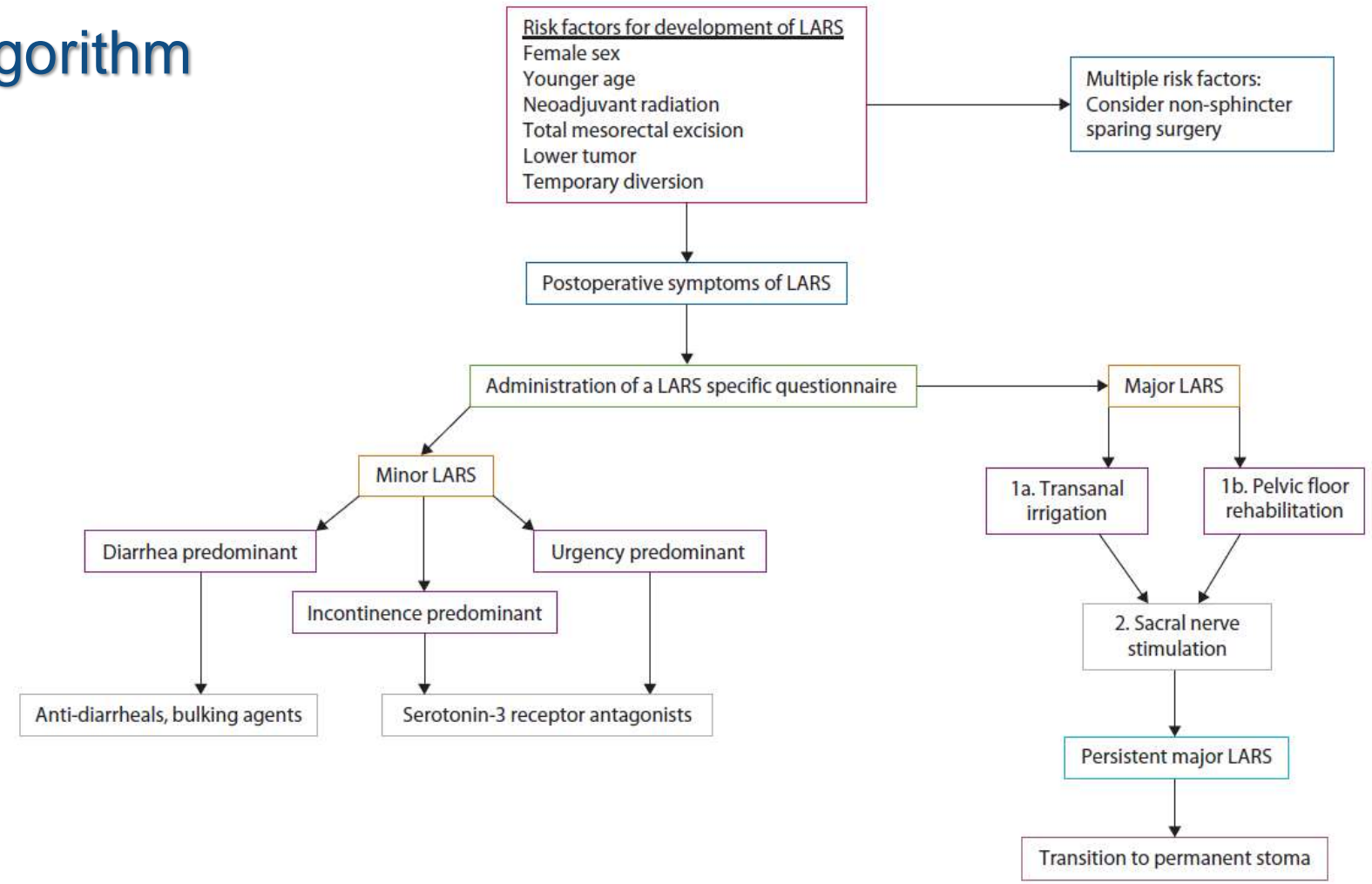
Figure 2 Cleveland Clinic Incontinence Score scoring system.



## Evaluation and treatment algorithm

### In pts with postop sx of LARS

- Start with LARS score
- Minor LARS – medical Tx
- Major LARS – 1. TAI / physio
- 2. SNM
- 3. Stoma

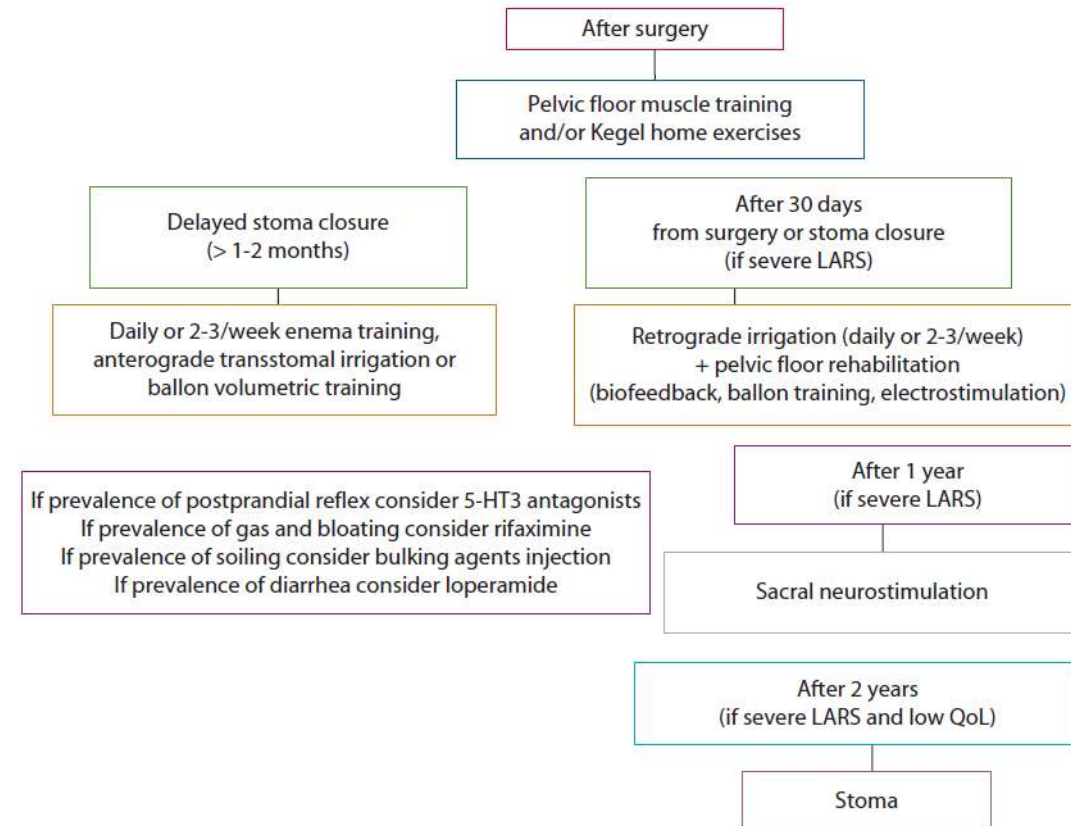




## Treatment algorithm

### For *major* LARS

- Transanal irrigation daily
- SNM after 1 year of TAI
- If no improvement with TAI and SNM – stoma after 2 years







## Postoperative guidance

### Multimodal guidance & screening

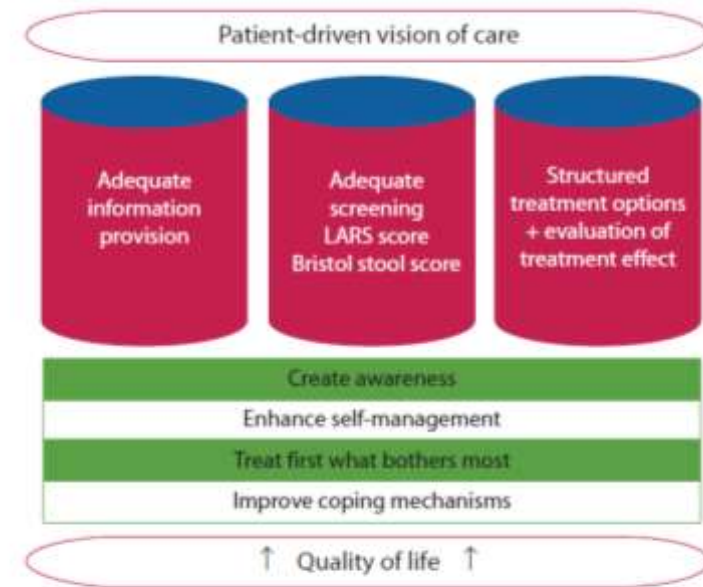
- 243 patients
- Comparison before and after implementation of guidance program
- Structured screening, evaluation of treatment options and monitoring of effect
- LAR, but also sigmoid resections included

## Implementation of a Postoperative Screening and Treatment Guidance for the Low Anterior Resection Syndrome: Preliminary Results

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**FIGURE 2.** Vision of care of the proposed postoperative guidance protocol with the principles that this guidance is stooled on. LARS = low anterior resection syndrome.



## Postoperative guidance

### Multimodal guidance & screening

- 243 patients
- Comparison before and after implementation of guidance program
- Structured screening, evaluation of treatment options and monitoring of effect
- LAR, but also sigmoid resections included

## Implementation of a Postoperative Screening and Treatment Guidance for the Low Anterior Resection Syndrome: Preliminary Results

**TABLE 2.** Median LARS scores and presence of major LARS before versus after protocol implementation

Type of surgery	Before protocol implementation	After protocol implementation	Significance, p-value
Median LARS scores			
LAR (Q <sub>1</sub> -Q <sub>3</sub> )	31 (14.5–36)	18 (2–31)	0.02*
Sigmoid resection (Q <sub>1</sub> -Q <sub>3</sub> )	16 (4–26.3)	15 (5.5–30)	0.79
Major LARS			
LAR, n (%)	42 (51.9)	5 (26.3)	0.045*
Sigmoid resection, n (%)	19 (16.7)	7 (24.1)	0.35

Q1-Q3 = 25<sup>th</sup> or 75<sup>th</sup> quartile; LAR = low anterior resection; LARS = low anterior resection syndrome.

\*P value is statistically significant.

LARS score improved with protocol  
 But only in LAR not sigmoid resection



## Postoperative guidance

# Implementation of a Postoperative Screening and Treatment Guidance for the Low Anterior Resection Syndrome: Preliminary Results

**TABLE 3.** Logistic regression analysis with major LARS as dependent variable

Independent variables	Univariate analysis				Multivariate analysis	
	Sigmoid resection only		LAR only		LAR only	
	OR	95% CI	OR	95% CI	OR	95% CI
<b>Implementation of protocol</b> Reference: before	1.5	0.6–4.3	0.3	0.1–1.0	0.5	0.1–1.9
<b>Age ≤ median age of 70 y</b> Reference: >70	2.4	0.9–5.7	2.3	1.0–5.2	2.2	0.9–5.7
<b>Women</b> Reference: men	0.9	0.4–2.3	1.1	0.5–2.5		
<b>ASA III–VI</b> Reference: I–II	0.8	0.2–2.8	CBC	CBC		
<b>Neoadjuvant therapy</b> Reference: no neoadjuvant therapy	CBC	CBC	2.9	1.3–6.7	1.4	0.5–4.1
<b>Adjuvant therapy</b> Reference: no adjuvant therapy	1.2	0.5–2.9	CBC	CBC		
<b>Low tumor height (≤5 cm)</b> Reference: >5 cm from anus	NA	NA	8.2	1.7–39.1	5.2	1.03–26.1
<b>Clavien-Dindo classification ≥III</b> Reference: 0–II	2.9	0.7–13.1	0.9	0.3–3.1		
<b>Diverting stoma</b> Reference: no diverting stoma	1.1	0.2–5.7	4.1	1.8–9.6	2.8	0.9–8.6
<b>Stoma closure ≤6 mo</b> Reference: >6 mo	1	0.0–22.2	3.5	0.9–13.9		

LAR = low anterior resection; LARS = low anterior resection syndrome; CBC = cannot be calculated; NA = not applicable.

Age, low tumor height as risk factors for LARS

Protocol implementation with improvement of LARS

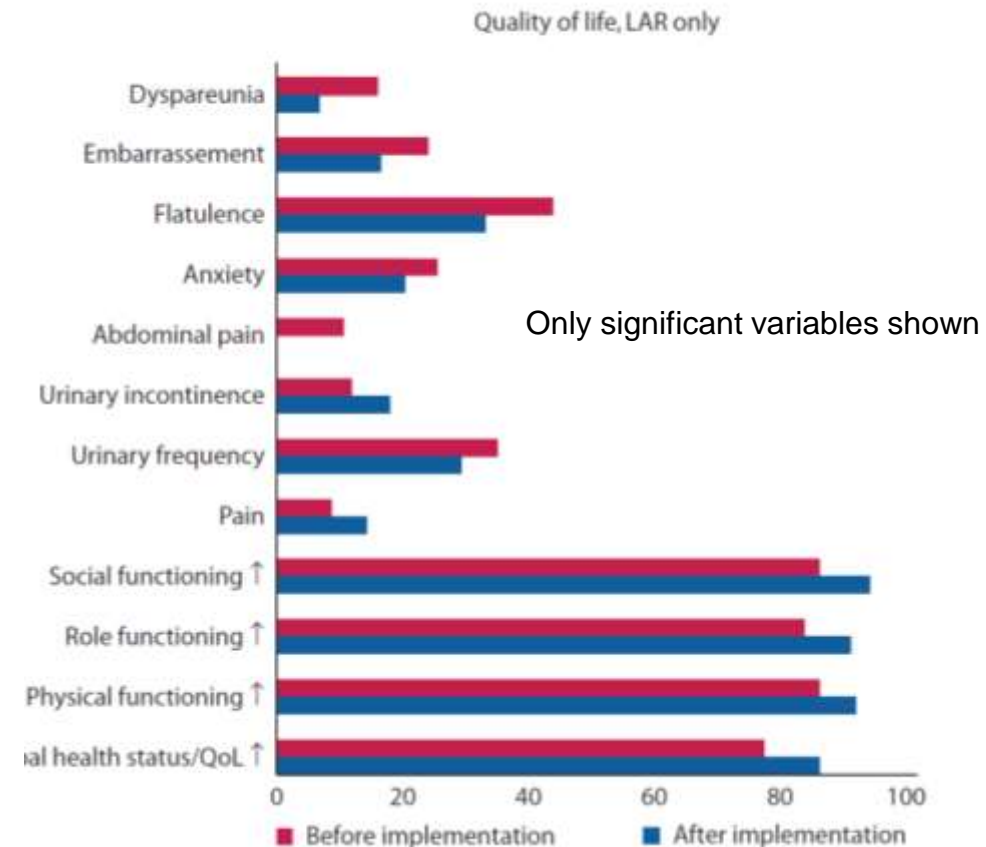




## Postoperative guidance

## Implementation of a Postoperative Screening and Treatment Guidance for the Low Anterior Resection Syndrome: Preliminary Results

Small but significant improvements in varied QOL aspects  
Dyspareunia, embarrassment and flatulence with moderate improvements





## How can we prevent LARS?





Identified risk factors for the development of LARS	Modifiable yes/no
• Age	No
• Height of transection	No
• Use of diverting ostomy	yes, but..
• Type of anastomosis	yes
• Radiation	yes

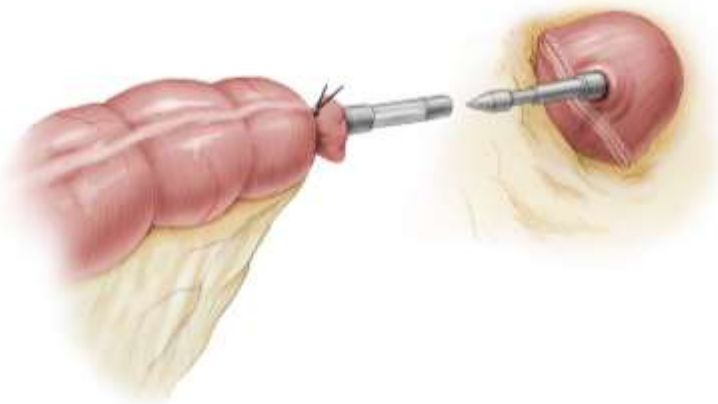
} Effective & meaningful?



## Type of anastomosis utilized

### Expert surgeon questionnaire

- 70-80% sphincter-sparing resections
- End-to-end anastomosis preferred in >60%



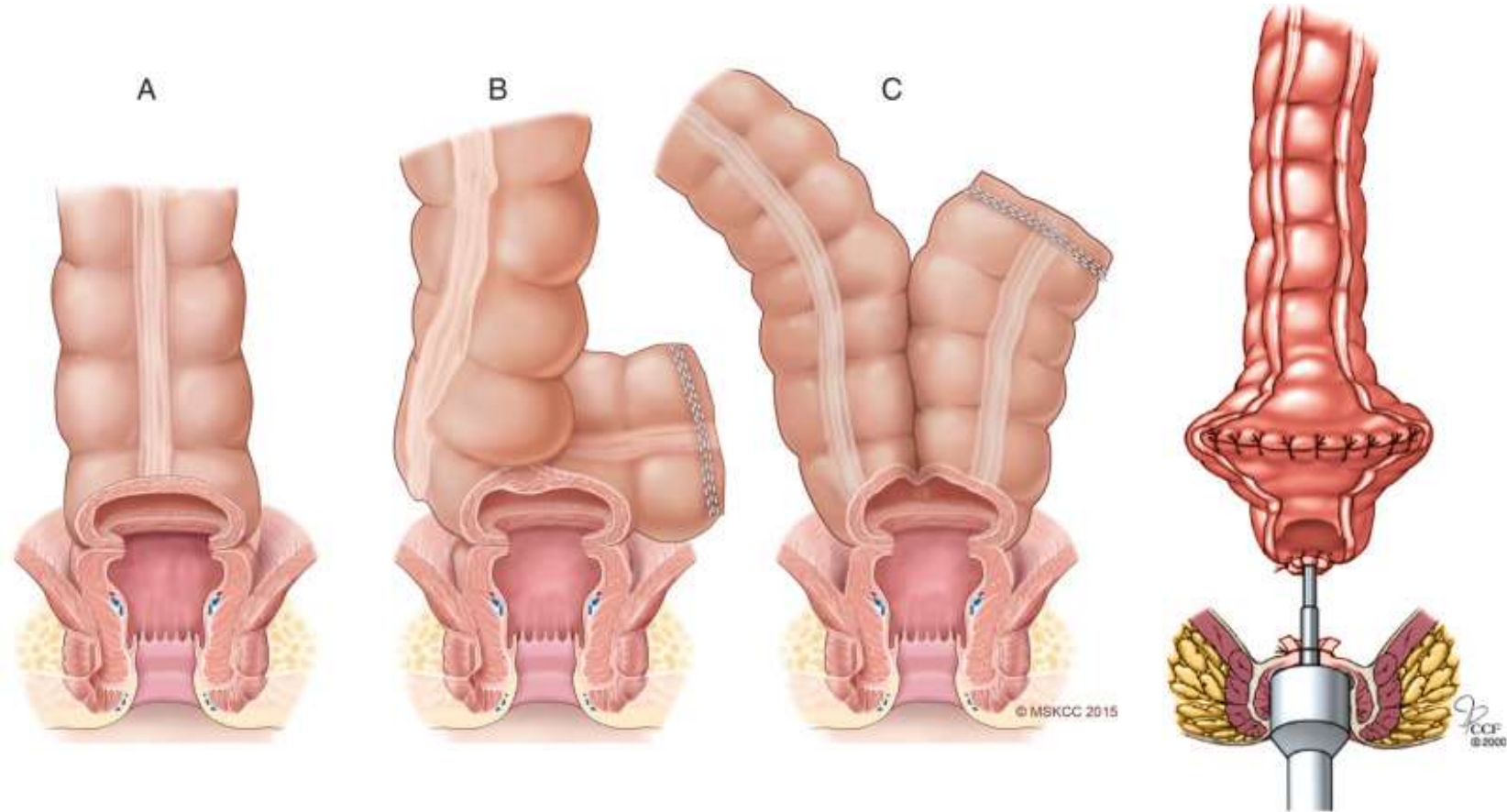
	ASCRS surgeons (%)	Spanish surgeons (%)
What is your hospital data for the approximate percentage of sphincter-sparing surgery cases with anastomosis in interventions for rectal cancer?		
Responders, no. (%)	248 (72.1)	150 (100)
<50 %	7.8	6.6
51–60 %	3.5	2.7
61–70 %	10.2	22.7
71–80 %	31.8	35.3
81–90 %	32.2	30.0
91–100 %	14.5	2.7
After total mesorectal excision, what technique do you prefer to use to perform the anastomosis?		
Responders, no. (%)	269 (78.2 %)	150 (100)
LAR with side-to-end anastomosis	16.0	28.0
LAR with end-to-end anastomosis	61.5	62.0
LAR with colonic pouch	19.1	5.4
LAR with coloplasty	1.5	2.0
LAR with Tumbull-Cutait technique (“pull-through”)	0.4	1.3
Other	1.5	1.3



## Type of anastomosis and LAR

End-to-end colorectal / coloanal anastomosis are the most widely used due to its simplicity and lower length requirements.

Are there functional benefits when using side-to-end or colonic J-pouch-anal anastomoses?





Ann Surg Oncol (2019) 26:3568–3576  
<https://doi.org/10.1245/s10434-019-07525-2>

Annals of  
**SURGICAL ONCOLOGY**  
OFFICIAL JOURNAL OF THE SOCIETY OF SURGICAL ONCOLOGY



ORIGINAL ARTICLE – COLORECTAL CANCER

## Quality of Life After Total Mesorectal Excision and Rectal Replacement: Comparing Side-to-End, Colon J-Pouch and Straight Colorectal Reconstruction in a Randomized, Phase III Trial (SAKK 40/04)

Karin Ribi, PhD<sup>1,8</sup>, Walter R. Marti, MD<sup>2</sup>, Jürg Bernhard, PhD<sup>1,3</sup>, Felix Grieder, MD<sup>4</sup>, Michael Graf, MD<sup>5</sup>, Beat Gloor, MD<sup>3</sup>, Gaudenz Curti, MD<sup>2</sup>, Markus Zuber, MD<sup>6</sup>, Nicolas Demartines, MD<sup>7</sup>, Christiane Andrieu, PhD<sup>8</sup>, Martin Bigler, MSc<sup>8</sup>, Stefanie Hayoz, PhD<sup>8</sup>, Heinz Wehrli, MD<sup>9</sup>, Christoph Kettelhack, MD<sup>10</sup>, Bruno Lerf, MD<sup>11</sup>, Fabrizio Fasolini, MD<sup>12</sup>, Christian Hamel, MD<sup>13</sup>, and  
For the Swiss group for clinical cancer research, section surgery

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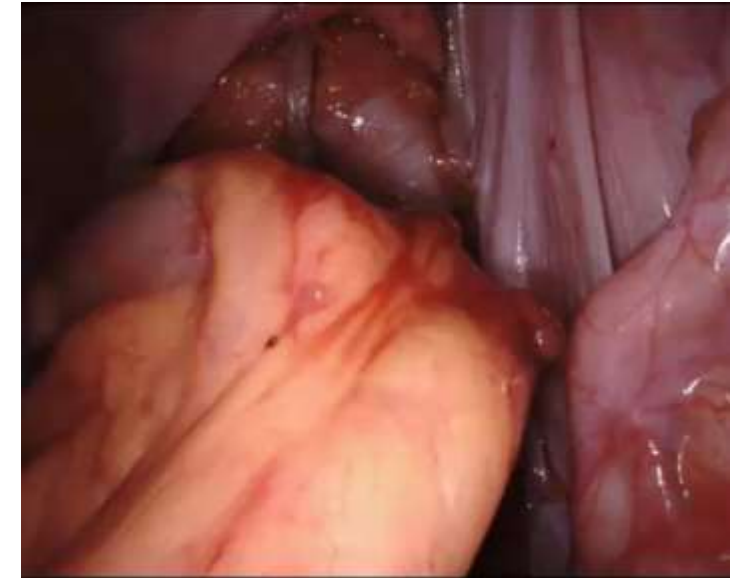
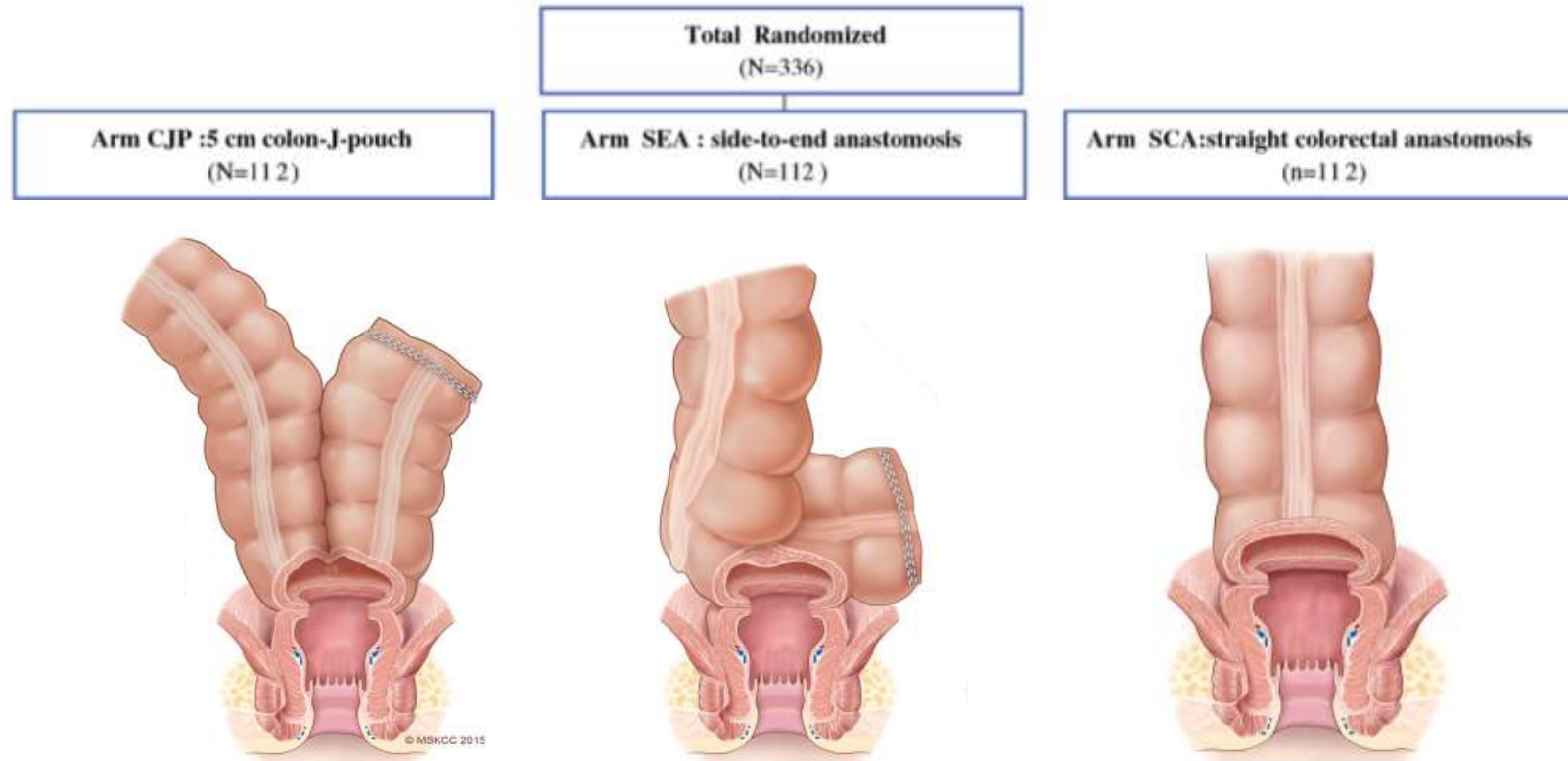


# LARS following rectal cancer resection

## Prevention



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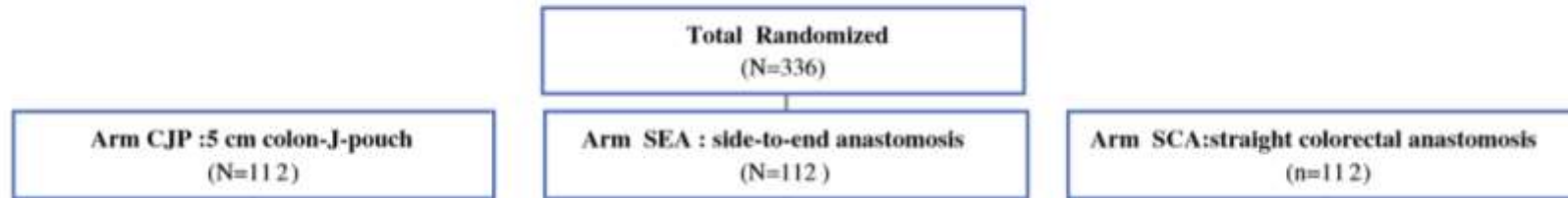


# LARS following rectal cancer resection

## Prevention

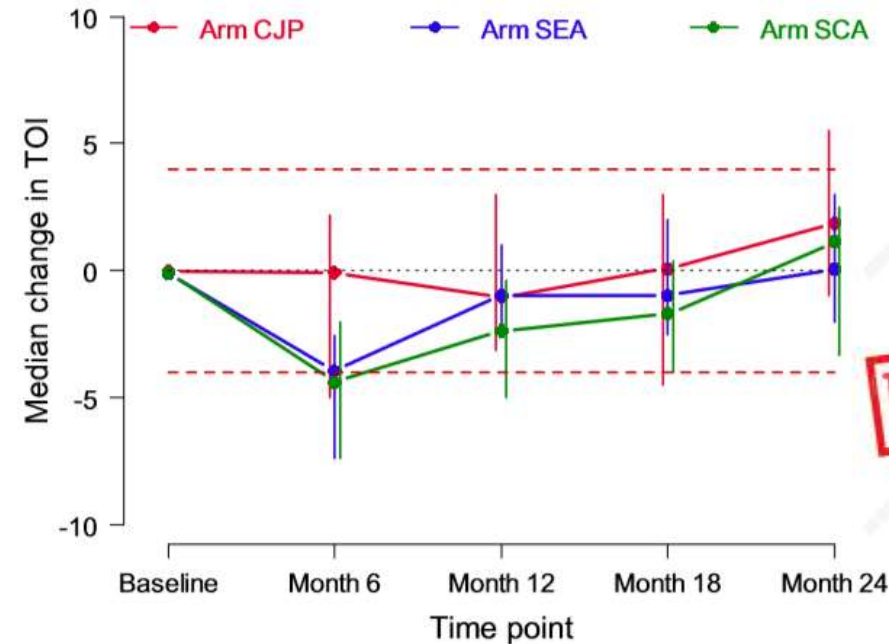


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### Comparison of 3 anastomotic techniques

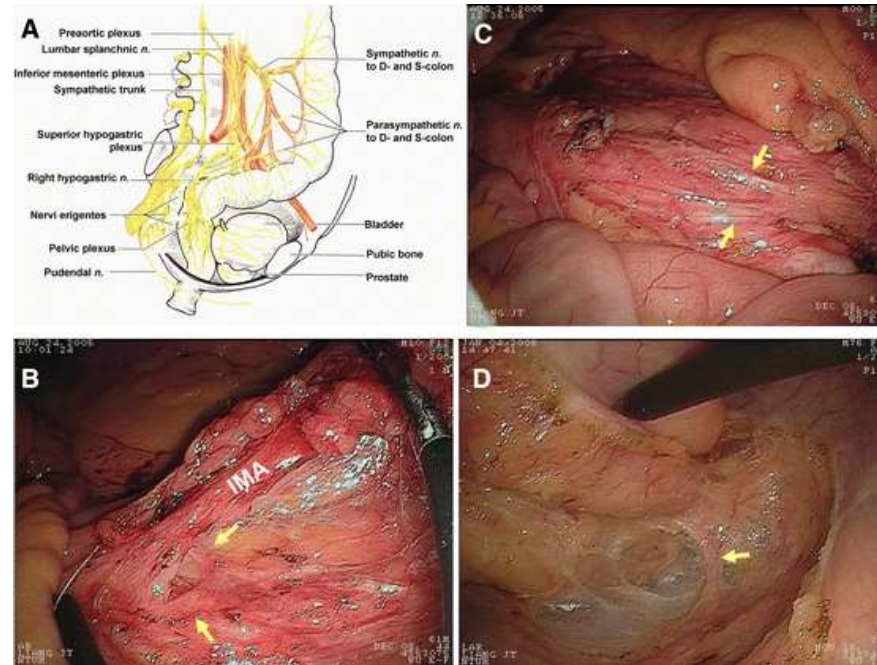
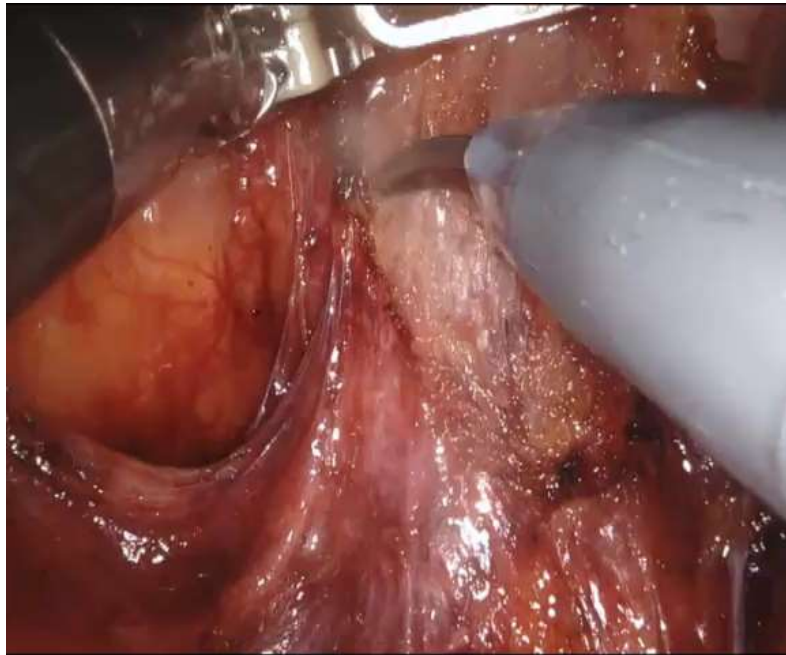
- 336 patients
- TOI = composite endpoint of physical (PWB) and functional (FWB) well-being scores as well as the colorectal cancer symptom score (CCS)
- Differences at 6 months (colonic J better)
- No further differences at 12, 18 and 24 months
- Type of anastomosis has only short-term influences on functional outcome



**USELESS**  
.. longterm



## Prevention through better surgery? Pelvic autonomic nerve-sparing LAR



(B) Inferior mesenteric plexus around IMA

(C) Hypogastric plexus overlying the interiliac trigone

(D) Hypogastric nerves adhering to the mesorectal fascia

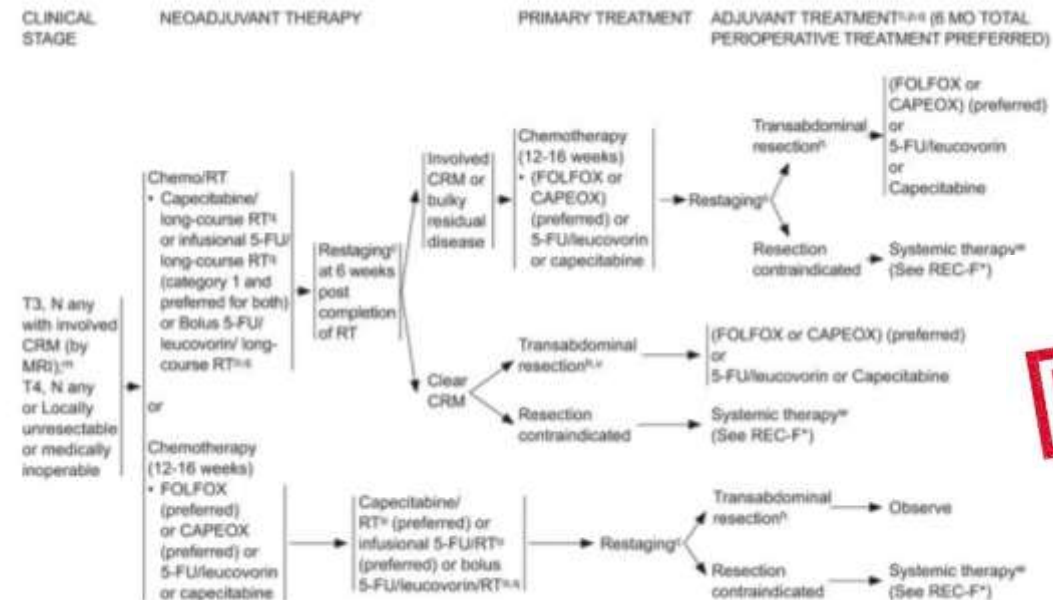
Pelvic autonomic nerve-sparing LAR – important for preservation of bladder and sexual function. Effects more pronounced in male than female patients undergoing LAR. No proven effect on severity of LARS.



## Prevention of LARS through meaningful use of (neo-)adjuvant R(C)T

### 8.2. Perioperative Therapie beim Rektumkarzinom

Nr.	Empfehlung/ Statement	EG	LoE
8.9. (2008)	Im Stadium I ist eine perioperative Therapie nicht indiziert.	A	5
8.10. (2008)	Im UICC-Stadium II und III ist die neoadjuvante Radio- oder Radiochemotherapie indiziert. Eine Sondersituation besteht bei cT1/2-Karzinomen mit fraglichem Lymphknotenbefall; hier ist auch die primäre Operation (mit ggf. adjuvanter Radiochemotherapie bei pN+) eine mögliche Behandlungsoption.	A	1b
8.11. (2008)	Der Stellenwert der Strahlentherapie des Rektumkarzinoms im oberen Drittel wird kontrovers diskutiert. Es kann eine adjuvante Therapie wie beim Kolonkarzinom oder eine perioperative Radio(chemo-)therapie wie beim Rektumkarzinom durchgeführt werden.	0	3a
8.12. (2008)	In Situationen, in denen ein Downsizing angestrebt wird (T4-Tumore, nicht ausreichender Sicherheitsabstand im Dünnschicht-MRT zur mesorektalen Faszie – Abstand 1 mm oder weniger – oder erwünschter Sphinktererhalt bei Tumoren im unteren Drittel), soll der präoperativen Radiochemotherapie der Vorzug vor einer Kurzzeit-Radiotherapie gegeben werden. Bei cT3-Tumoren oder cN+ Tumoren, bei denen kein Downsizing angestrebt wird, kann die präoperative Therapie entweder als Radiochemotherapie oder als Kurzzeitbestrahlung erfolgen..	A	3b



**EFFECTIVE**  
 .. but risky!

Consider individual risk of LARS and associated QOL ↓ in borderline indications for neoadjuvant RT.



## Low anterior resection syndrome

- Remains ill-defined and **inadequately studied**
  - **LARS score** to quantify symptoms (no / mild / major) simple and validated
  - **Preoperative assessment** important (high rates of preoperative LARS!)
  - Risk factors: ♀ **Gender, TME, neoadjuvant CRT**
  - Early postoperative assessment to initiate therapy early
- 
- Medical tx / biofeedback for mild LARS
  - Major LARS – transanal irrigation and SNM
  - Careful consideration of (neo-)adjuvant RT in borderline indications



# Kolorektale Chirurgie @ USZ



Andreas Rickenbacher  
Jamie Schneider  
Karoline Horisberger  
Matthias Turina  
Daniela Cabalzar  
Irene Mari  
Heike Simmack

Thank you for your  
attention!