Rektumkarzinom:
Sphinktererhalt: Zu welchem Preis?

PD Dr. D. Dindo, Zürich

Stadtspital Triemli

Goals of Rectal Cancer Surgery

- **Local and systemic tumor control**
- **Survival in the long-term**
- Preservation of continence and function
- Quality of life

Quality of Life: Definition

QOL
QUALITY of LIFE
MEASURES

Germer CT. Chirurg 2009

Quality of Life: Determination

Name	Beschreibung	Ergebnisse
SF-36	**Allgemeiner** Fragebogen 66 Begriffe, 8 Dimensionen (körperliches Befinden und Funktion, Einschränkungen, Sozialfunktion, mentales Befinden, Vitalität, somatische Schmerzen, allgemeine und gesundheitliche Wahrnehmung)	Skala von 0–100; hohe Werte korrelieren mit einer besseren Funktion und Wohlbefinden
EORTC-QLQ-C30[2]	**Karzinomspezifischer** Fragebogen 30 Begriffe, 5 funktionelle Skalen (körperlich, funktionell, kognitiv, emotional, sozial), 3 Symptomskalen (Müdigkeit, Schmerzen, Übelkeit/Erbrechen), eine globale Gesundheitsstatusskala und LQ-Skala, 5 Einzelbegriffe (Dyspnoe, Anorexie, Schlafstörung, Konstipation und Diarrhö), wahrgenommene finanzielle Auswirkung	Subskala von 0–100; Hohe funktionelle Werte bedeuten eine hohes Funktionsniveau; hohe Symptomwerte bedeuten ein hohes Niveau von Symptomen und Problemen
EORTC-QLQ-CR38[3]	**Krankheitsspezifischer** Fragebogen 38 Begriffe einschließlich Symptome und Nebenwirkungen der Therapie, Körperbild, Sexualität, Zukunftsperspektiven	Subskala von 0–100; Hohe funktionelle Werte bedeuten eine hohes Funktionsniveau; hohe Symptomwerte bedeuten ein hohes Niveau von Symptomen und Problemen

QOL
QUALITY of LIFE
MEASURES

[2]Aaronson NK et al. J Natl Cancer Inst 1993
[3]Sprangers MA et al. Eur J Cancer 1999

Determinants of QoL

- Rectal and bladder function
  - Evacuation problems
  - Incontinence
- Sexual function

Postop. urogenital dysfunction

n=98, lap. **TME**, after **RT**

6 mts postop.

• Bladder function:	72%	23%	5%
• Ejaculation:	56%	19%	**25%**
• Potency:	63%	16%	**21%**
• Female sexuality:	53%	14%	**32%**

Liang JT et al Ann Surg Oncol 2007

Postop. satisfaction

597 pts, follow-up **5 yrs**

	5X5 Gy+TME	TME
w/o Stoma	**50%**	**60%**
Stoma	**75%**	**75%**

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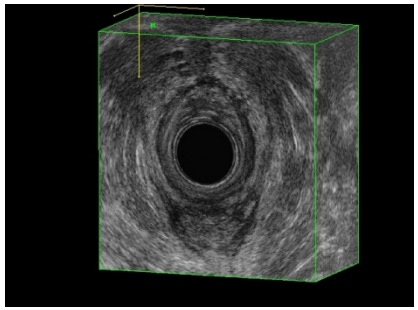
Peeters K et al. J Clin Oncol 2005;23:6199-206

QoL after Rectal Surgery

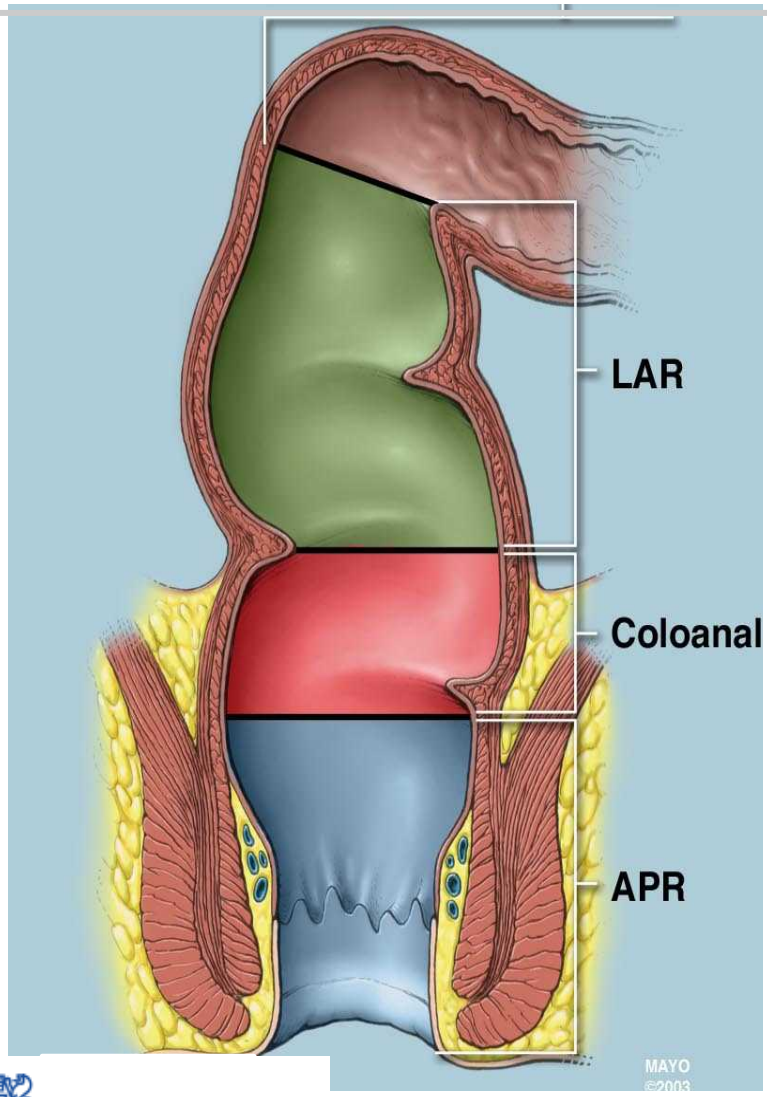
- Anastomosis?



- Neo-/adjuvant treatment?

- Colostomy?

Low rectal resection: Distal margin



1980 **5cm**

1983 **2cm**

Williams NS. BJS 1983
Pollett WG. Ann Surg 1983

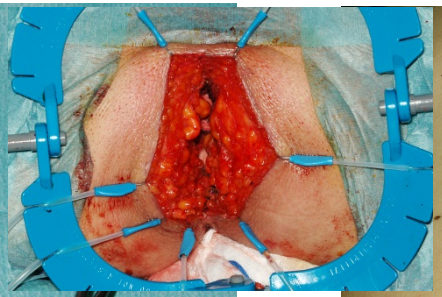
1995 **<2cm**

Rulllier E; Ann Surg 2005

Low Rectal Resection

APR

Abdominoperineal Amputation

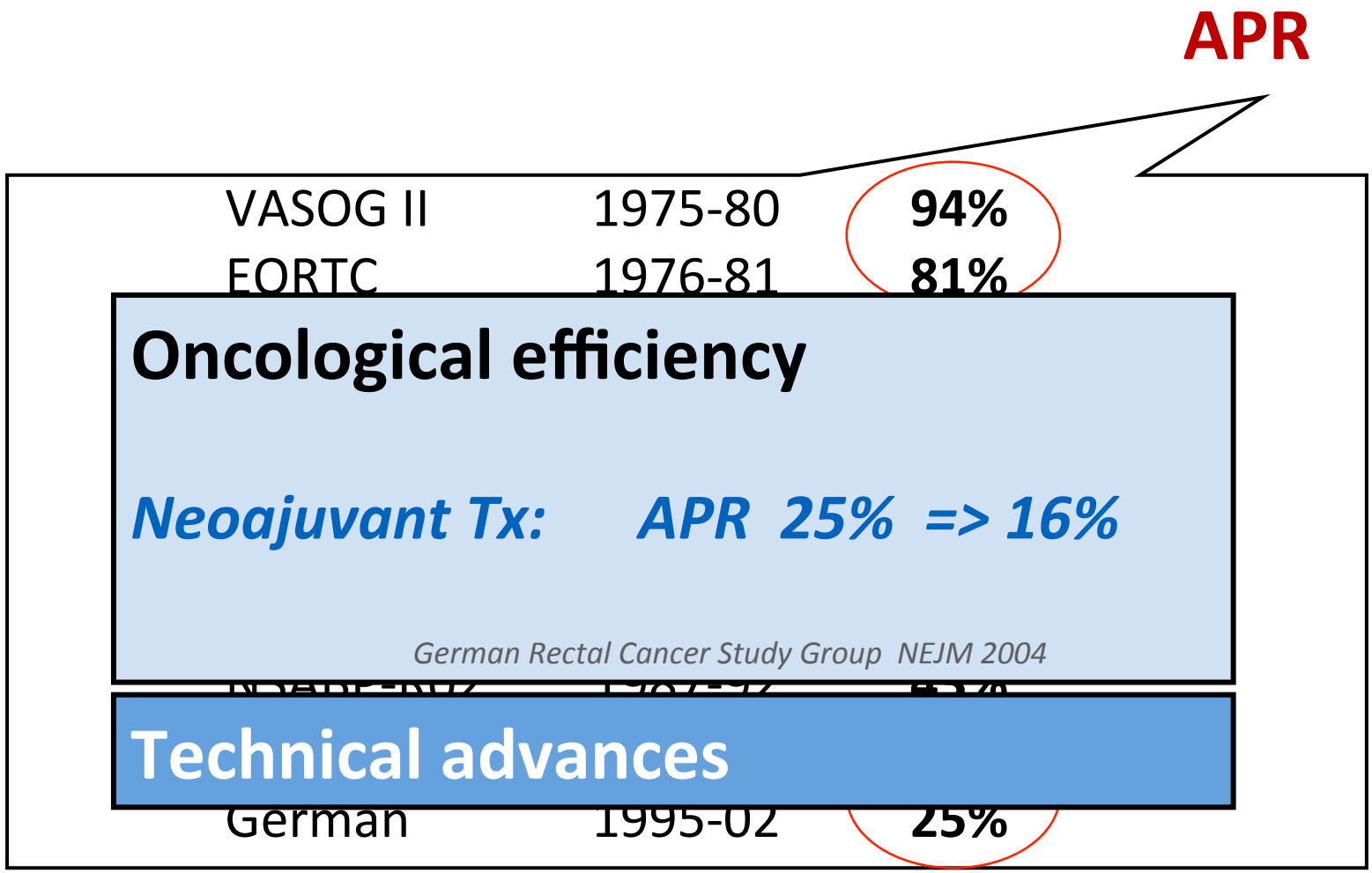


Low Rectal Resection

APR

VASOG II	1975-80	**94%**
EORTC	1976-81	**81%**
Stockholm I	1980-87	**63%**
GITSG	1981-85	**59%**
Swedish	1987-90	**56%**
NCCTG-7951	1980-86	**51%**
NCCTG	1986-90	**47%**
NSABP-R02	1987-92	**43%**
Dutch	1996-99	**27%**
German	1995-02	**25%**

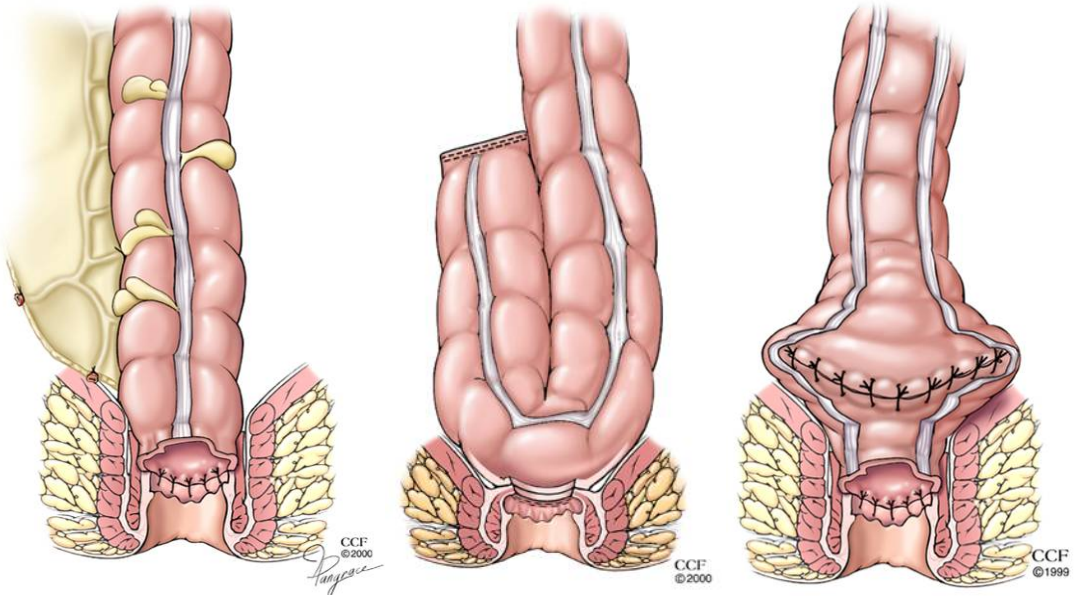
Low Rectal Resection



Low Rectal Resection

CAA **APR**

Coloanal Anastomosis



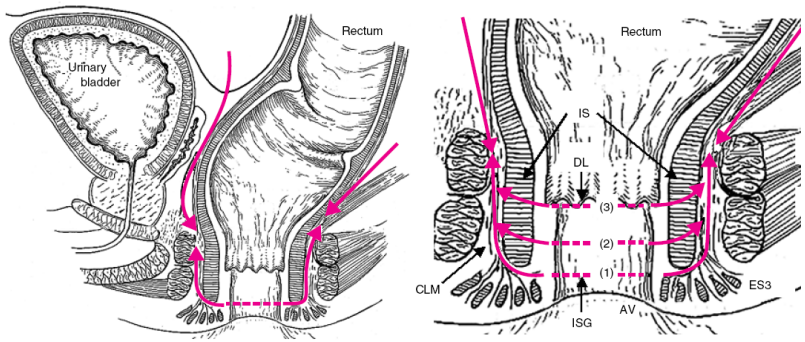
Low Rectal Resection

ORIGINAL ARTICLES

Sphincter-Saving Resection for All Rectal Carcinomas

The End of the 2-cm Distal Rule

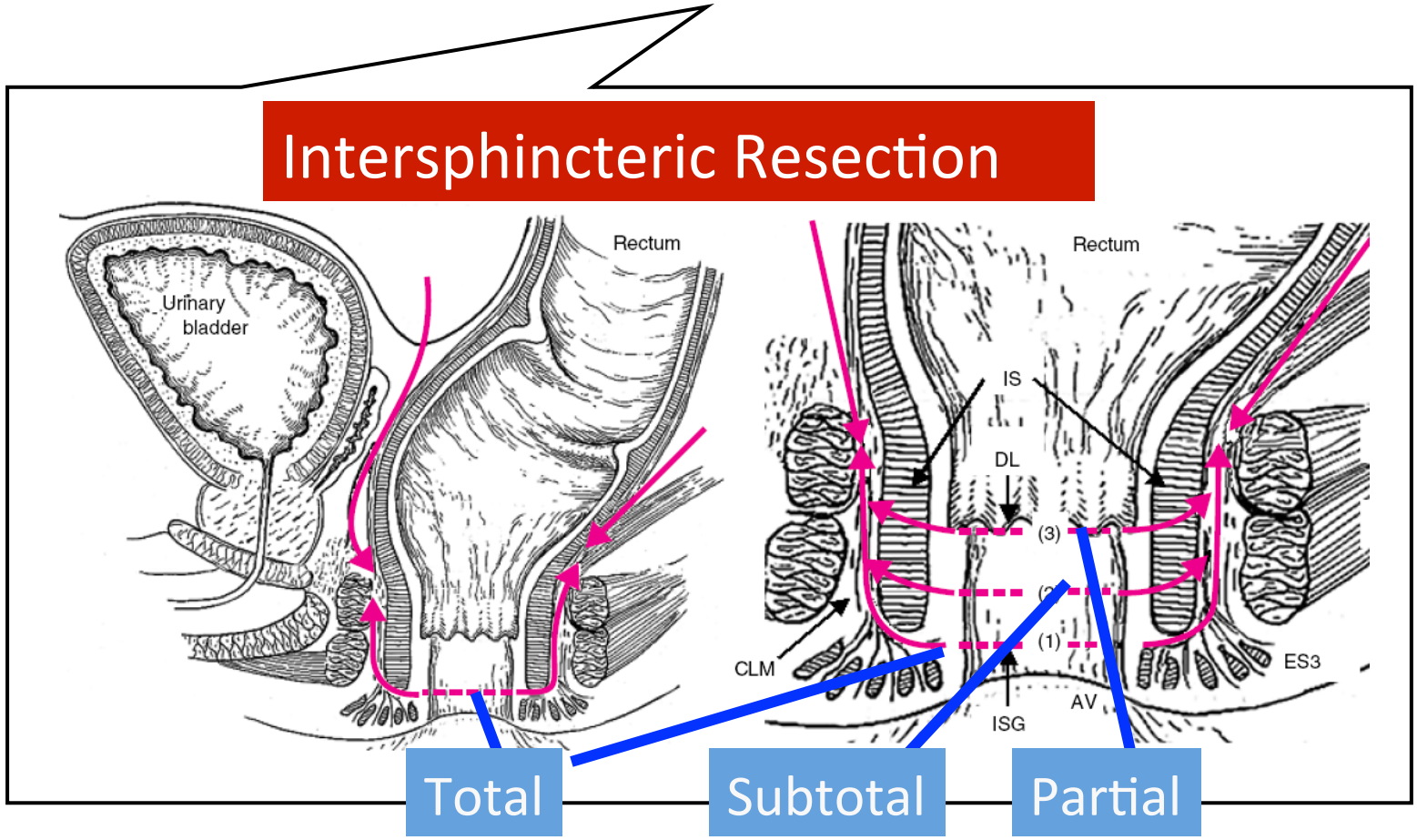
Eric Rullier, MD, Christophe Laurent, MD,* Frédéric Bretagnol, MD,* Anne Rullier, MD,† Véronique Vendrely, MD,‡ and Frank Zerbib MD, PhD§*



Rullier E. Ann Surg 2005

Low Rectal Resection

CAA **ISR** **APR**



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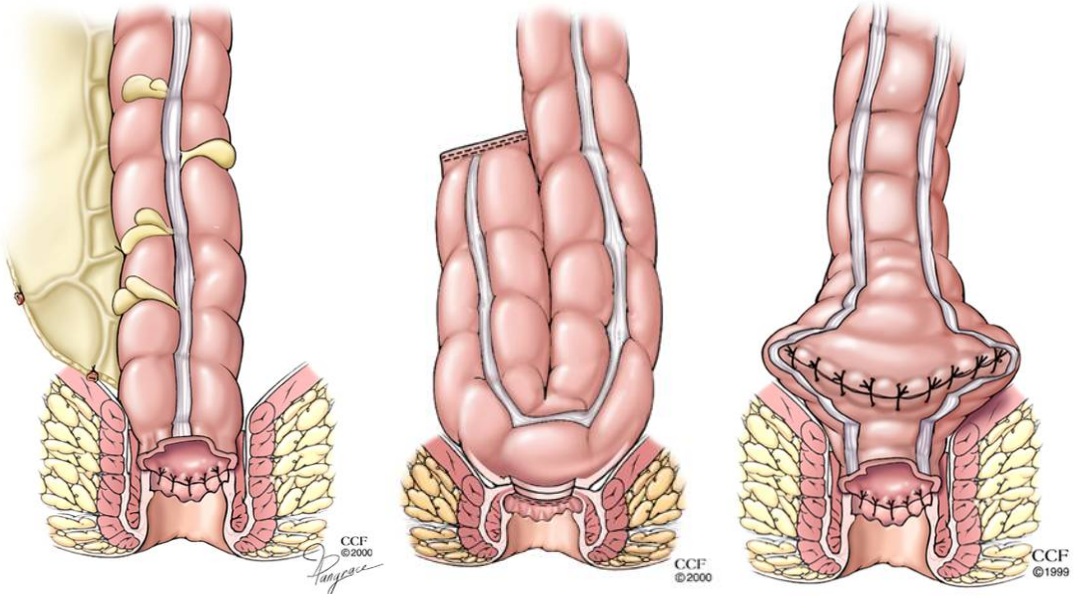
Impact of Reconstruction

CAA ISR APR

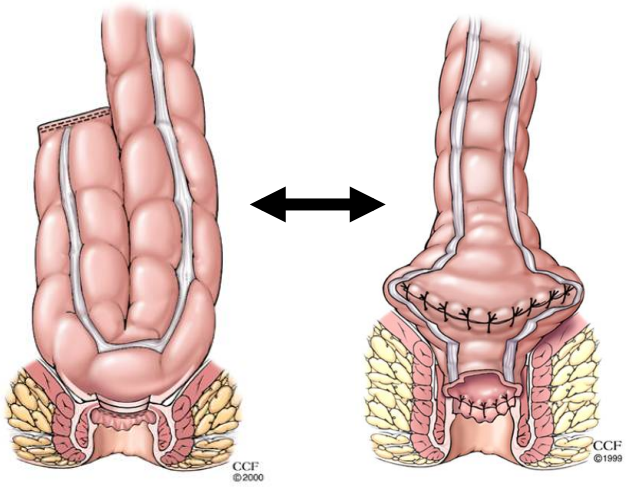


Stadtspital Triemli

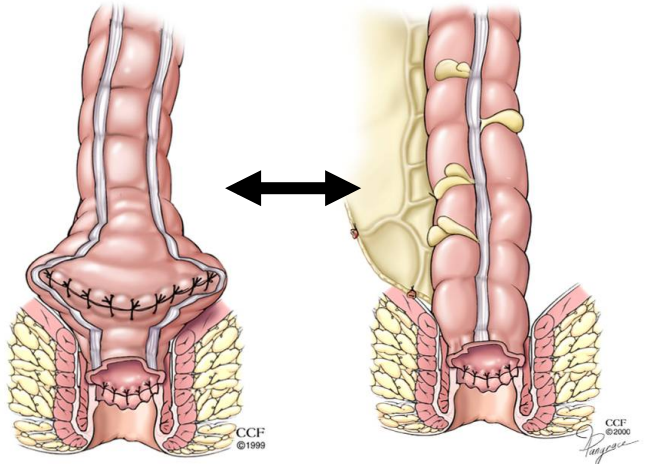
Fazio VW et al. Ann Surg 2007

Impact of Reconstruction

J-Pouch eligible



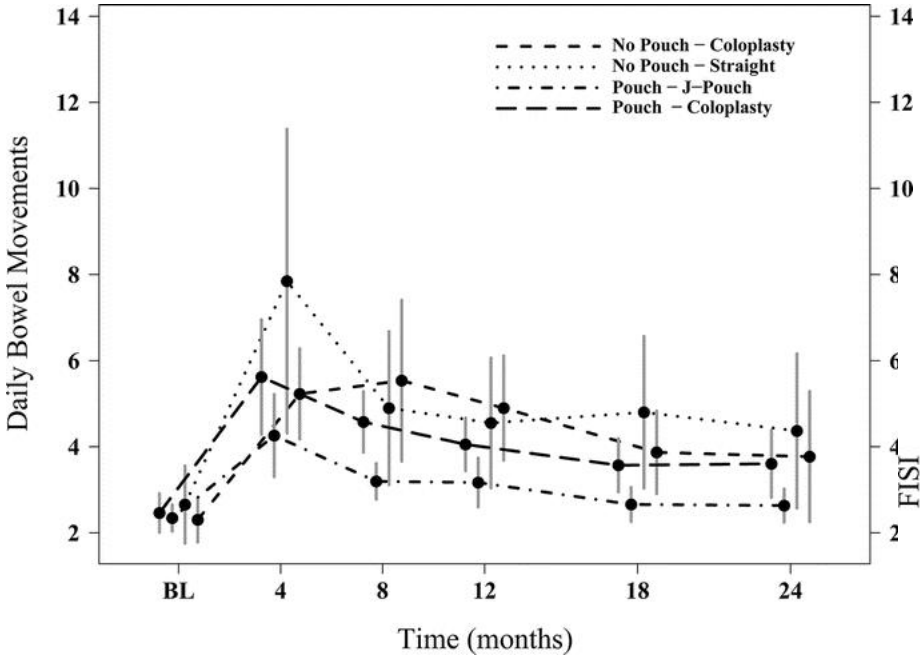
J-Pouch ineligible

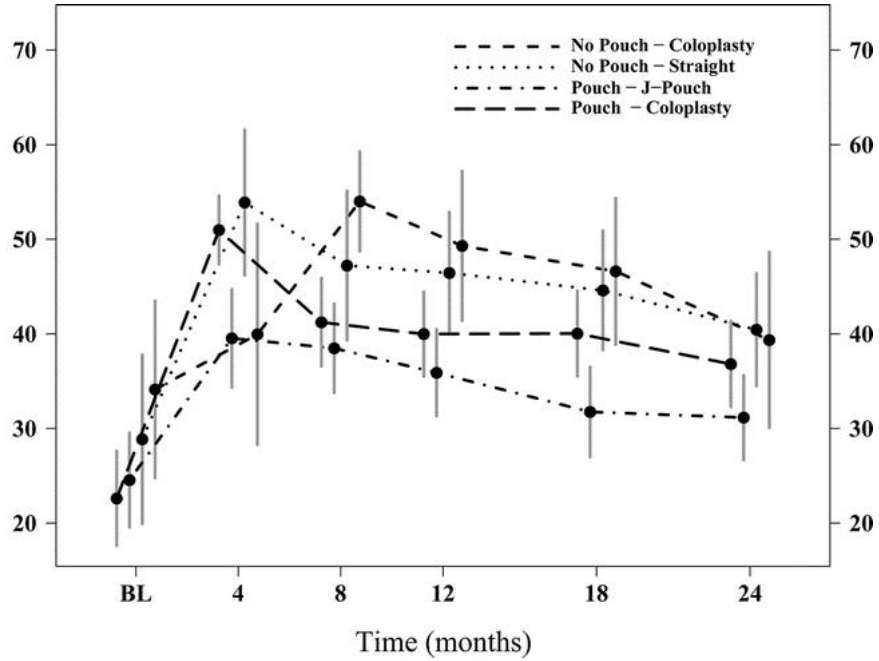


n=364, multicenter PRT, all 48 month FU

Fazio VW et al. Ann Surg 2007

Impact of Reconstruction





Stadtspital Triemli

Fazio VW et al. Ann Surg 2007

Impact of Reconstruction

TABLE 5. Intergroup Comparison of Quality of Life

	J-Pouch Ineligible			J-Pouch Eligible		
Parameter	**Coloplasty (CP-1)**	**Straight (SA)**	***P****	**J-Pouch (JP)**	**Coloplasty (CP-2)**	***P****
SF-36 MCS						
Preoperative	48.0 ± 10.3	48.1 ± 9.5	0.89	50.8 ± 8.67	50.0 ± 9.2	0.61
4 mo	48.6 ± 9.2	44.4 ± 10.6	0.18	51.5 ± 9.2	49.6 ± 9.7	0.20
12 mo	50.9 ± 8.0	47.4 ± 10.3	0.19	52.8 ± 7.8	52.7 ± 8.3	0.96
24 mo	52.1 ± 8.5	47.0 ± 11.6	0.09	52.4 ± 8.9	53.5 ± 7.8	0.47
SF-36 PCS						
Preoperative	46.5 ± 8.3	47.2 ± 8.9	0.59	50.2 ± 7.5	50.2 ± 6.8	0.56
4 mo	44.5 ± 9.1	42.5 ± 8.9	0.41	48.6 ± 7.8	47.9 ± 8.1	0.71
12 mo	47.7 ± 9.1	48.8 ± 9.7	0.46	51.9 ± 6.6	51.5 ± 7.5	0.88
24 mo	49.6 ± 8.7	50.1 ± 8.4	0.78	52.4 ± 7.2	52.3 ± 6.3	0.53

*Quantitative data summarized as mean ± SD, and compared using Wilcoxon rank sum test.

Sensitivity of SF-36 ?

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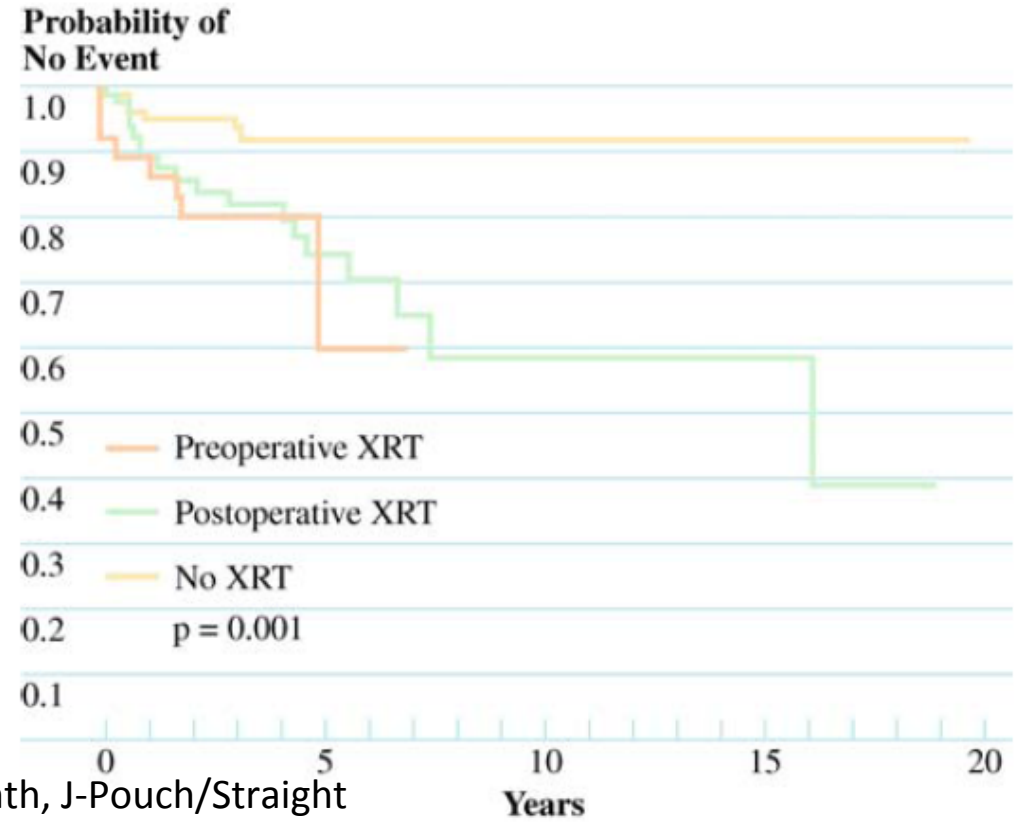
Fazio VW et al. Ann Surg 2007

Function, Continence

CAA **ISR** **APR**

Colostomy-free survival



n=192, median FU 65 month, J-Pouch/Straight

Hassan I et al. Dis Colon Rectum 2007

Function, Continence

CAA ISR APR

→ **Permanent Stoma 24%**

- 61% anorectal dysfunction (incontinence, fistula, abscess)
- 9% bowel obstruction
- 9% patient-related
- 22% recurrence

n=192, median FU 65 month, J-Pouch/Straight

Hassan I et al. Dis Colon Rectum 2007

Function, Continence

CAA ⟷ **ISR** **APR**

Functional Results After ISR and CAA for Low Rectal Cancer

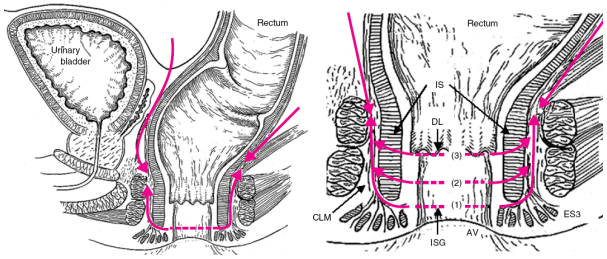
	ISR Group (n = 40)	CAA Group (n = 37)	*P* Value
Stool frequency per 24 hr	2.8 ± 2.1	2.3 ± 1.3	0.22
Urgency	15 (37)	14 (38)	1
Stool fragmentation	25 (62)	24 (64)	1
Dyschesia	16 (40)	12 (32)	0.64
Feces-flatus discrimination	25 (62)	27 (73)	0.34
Continence Wexner score	10.8 ± 5.2	6.9 ± 4.2	<0.001
Antidiarrheal medications	24 (60)	13 (35)	0.04
Alimentary restriction	8 (20)	11 (30)	0.43
Continence Kirwan classification			<0.01[a]
I Perfect	6 (15)	12 (32)	
II Incontinence of flatus	15 (38)	18 (49)	
III Occasional minor soiling	14 (35)	7 (19)	
IV Frequent major soiling	5 (12)	0	
V Incontinent (required colostomy)	0	0	

ISR = intersphincteric resection; CAA = conventional coloanal anastomosis.
Data are numbers with percentages in parentheses unless otherwise indicated.
[a] I–II *vs.* III–IV–V.

Retrospective, n=37 CAA and n=40 ISR, median FU 56 month

Bretagnol F et al. DCR 2004

Impact of Reconstruction



- Bowel/24h 1.7-5
- Urgency 19-58%
- Leakage day 15%
- Leakage night 20%
- Wexner Score 6-12

Review, n=612, 13 studies

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Tilney HS. Colorectal Dis 2007

Impact of Reconstruction

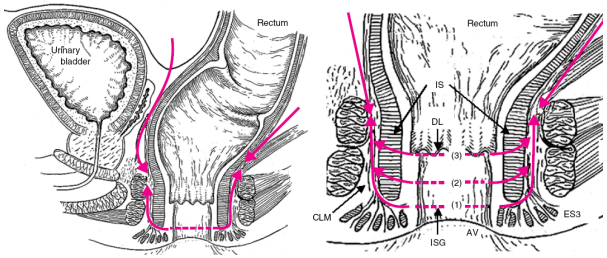


TABLE 2. Clinical course of anal dysfunction in patients who underwent ISR followed by stoma closure

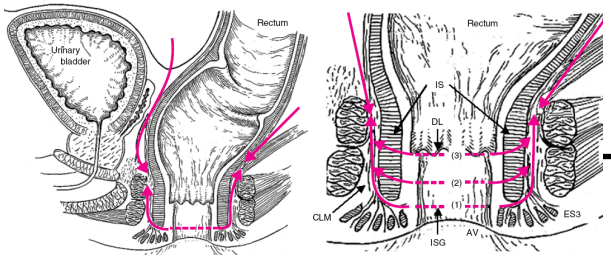
Symptoms related to anal function	*3 months*	*6 months*	*12 months*	*24 months*
Bowel movements >5 per day	53/90 (59)	41/85 (48)	27/76 (36)**	15/58 (26)**
Incontinence of gas	20/84 (24)	23/80 (29)	17/71 (24)	14/56 (25)
Incontinence of loose stools	34/88 (39)	22/84 (26)	20/74 (27)	14/60 (23)*
Incontinence of solid stools	24/88 (27)	18/84 (21)	17/74 (23)	10/60 (17)
Soiling during the day	35/90 (39)	22/85 (26)*	20/74 (27)	14/60 (23)*
Soiling during the night	21/90 (23)	13/85 (15)	13/74 (18)	11/60 (18)
Pad wearing	67/87 (77)	54/85 (64)	42/74 (57)**	37/59 (63)*
Cannot discriminate between feces or flatus	19/88 (22)	10/85 (12)	8/74 (11)	3/58 (5)**
Urgency	16/87 (18)	11/85 (13)	9/74 (12)	10/58 (17)
Stool fragmentation	45/87 (52)	35/85 (35)	34/74 (46)	30/58 (52)
Very low satisfaction	21/85 (25)	10/85 (12)*	10/72 (14)	10/58 (17)

ISR = intersphincteric resection. • Data are proportion of patients reporting daily problems via questionnaire, with percentages in parentheses.
Percentages with each anal dysfunctions in 6, 12 and 24 months were statistically compared with those in 3 months using Fisher's exact test.

n=96, median margin 15mm, median FU 37 month

Ito M et al. Dis Colon Rectum 2009

Impact of Reconstruction



Wexner score	ISR	LAR
1 (incontinence for solid stool)	2.2	2.0
2 (incontinence for liquid stool)	2.4	1.9
3 (incontinence for gas)	2.8	2.2
4 (use of pads)	3.2	1.7
5 (social life limitations)	2.3	1.7
Summary score (0–20)*	**12.90**	**9.50**

*p, 0.0038

Konanz J et al. Int J Colorectal Dis 2013

Impact of Reconstruction

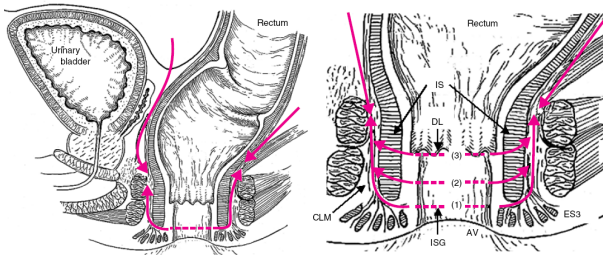


TABLE 5. Factors Influencing Functional Outcome: Multivariate Analysis

	OR	IC 95%	*P*
Age	1.03	0.98; 1.08	0.20
Gender	1.14	0.37; 3.52	0.82
Stage			
0-1-2	1		
3-4	1.31	0.44; 3.95	0.63
Preop. radiotherapy	3.07	1.05; 8.98	0.04

n=90, median margin 12mm, median FU 56 month

Chamlou R. Ann Surg 2007

Function, Continence

CAA ISR **APR**

- Change/Empty bags 2-4x/day
- Change appliance every 2-3 days
- 5‘339€ / year
- Parastomal hernia up to 45%
- Skin Problems 20%
- Prolapse 2-5%

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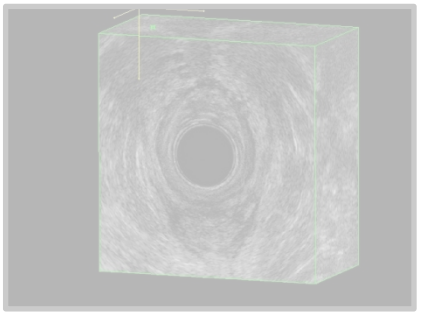
Carne P. BJS 2003 Adang EM . DCR 1998
Salvadalena G. J Wound Ostomy Continence Nurs 2008

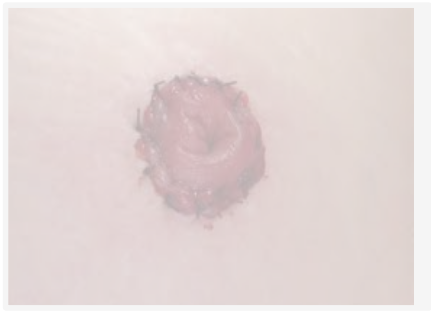
QoL after Rectal Surgery

- Anastomosis?



- Neo-/adjuvant treatment?

- Colostomy?



Effect of neoadjuvant treatment

Dutch TME trial, 1996 - 1999, 1,861 patients
Rotterdam Symptom Check List (RSCL) : ‹VAS›

	RT+	RT-	p
Incontinence	**62%**	**38%**	p<0.001
Bowel moves./d	3.7%	3.0%	p=0.011
Pads	56%	33%	p<0.001

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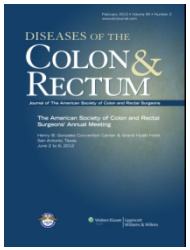
Marijnen CA et al. J Clin Oncol 2005

Effect of neoadjuvant treatment



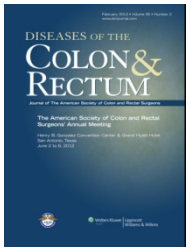
Swedish trial

64 pts, follow-up **14 yrs (9-23)**

	RT+	RT-	p
Inconinence	**57%**	**26%**	p<0.001
Soiling	38%	16%	P<0.001
Bowel moves / d	3	1.5	p<0.001

Pollack J et al. DCR 2006

Effect of neoadjuvant treatment



Coloanal Anastomosis (Straight/J-Pouch Anastomosis)
RT: 50.4 Gy

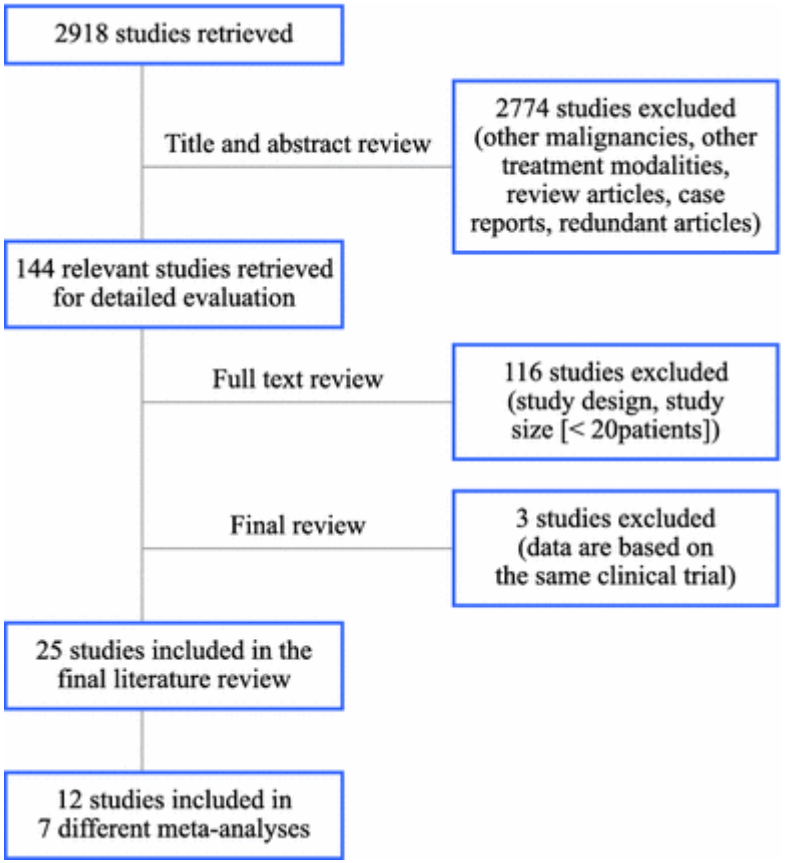
192 pts, follow-up **5 J.**

	RT+	RT-	p
Incomplete evacuation	**55%**	**30%**	p<0.001
Impaired general health status	**36%**	9%	P<0.001
Impaired social life	**50%**	26%	p<0.001

Hahnloser D et al. Dis Colon Rectum 2006

Effect of neoadjuvant treatment

25 Studies
n= 6548



Stadtspital Triemli

Loos M et al. Ann Surg Oncol 2012

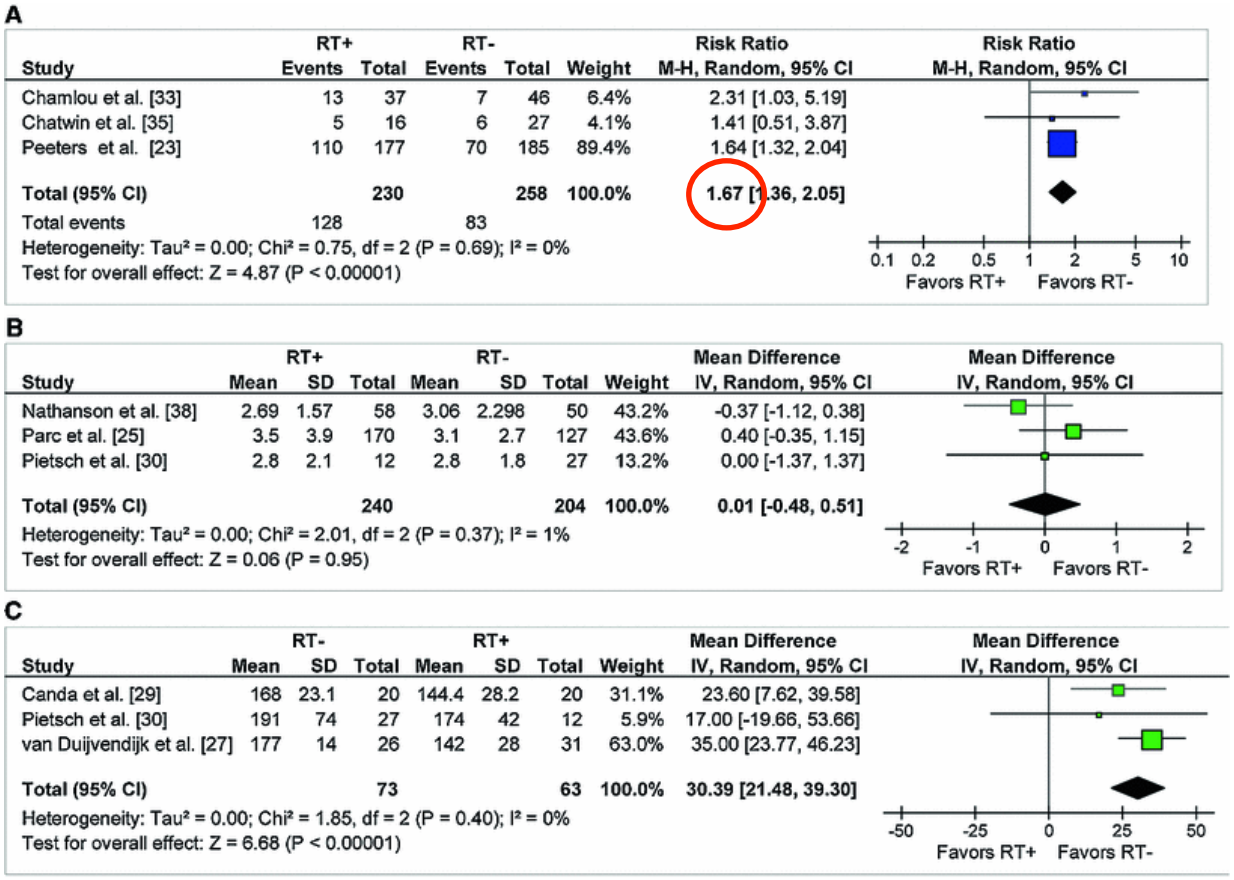
Effect of neoadjuvant treatment

25 Studies, n= 6548

Stool-Incontinence

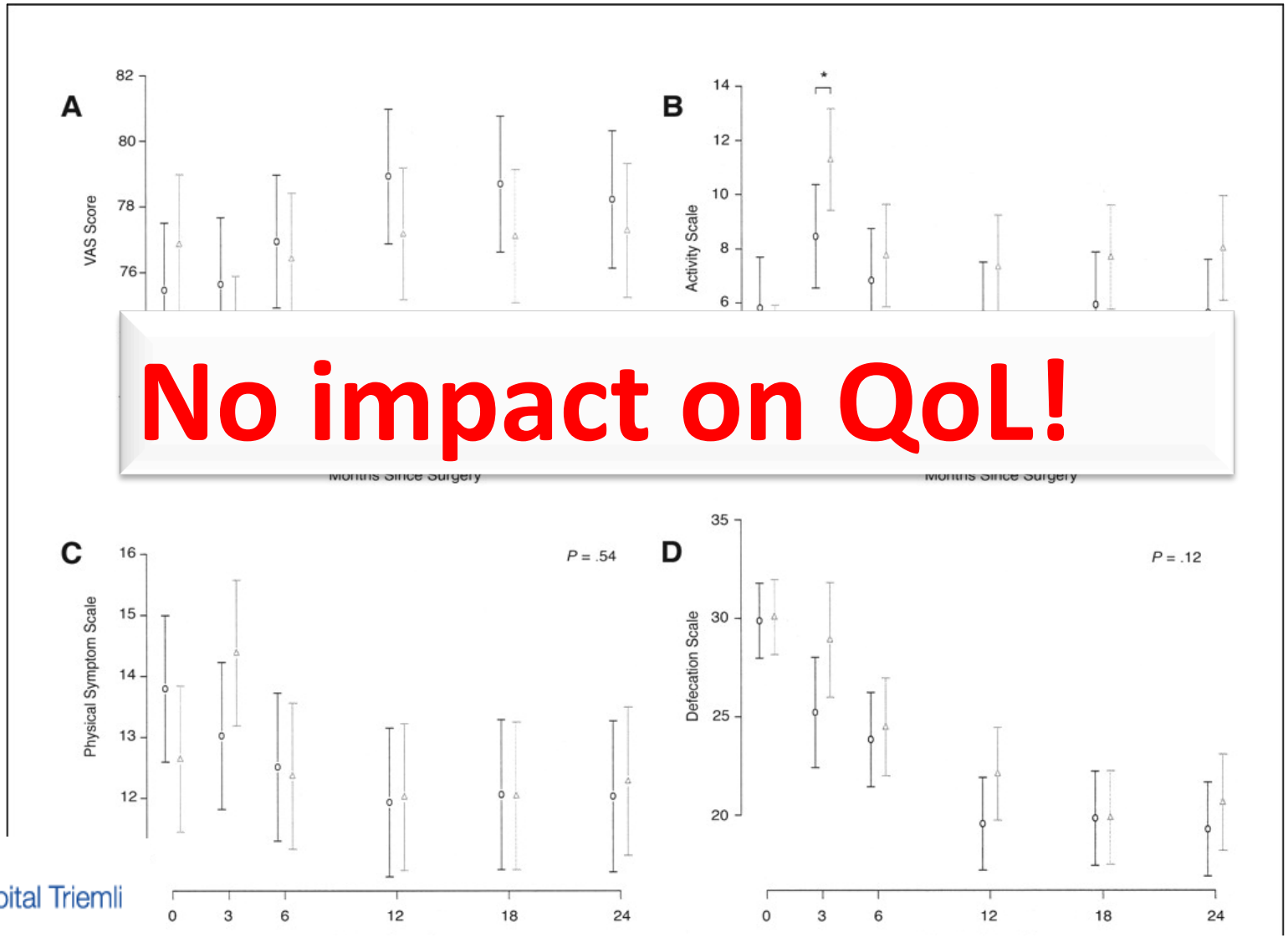
Bowel movements/d

Max. squeeze pressure



Loos M et al. Ann Surg Oncol 2012

Effect of neoadjuvant treatment



No impact on QoL!

n=990
TME, 5x5Gy

Stadtspital Triemli

Marijnen CA et al. J Clin Oncol 2005

Effect of neoadjuvant treatment

	PRT+			PRT-			*P*
	3	12	24	3	12	24	
Male							
Sexual functioning	46.2	46.4	47.4	40.3	39.4	40.8	.004
Erection disorders	43.4	52.6	53.9	44.2	45.3	47.1	.03
Ejaculation disorders	34.1	39.1	42.5	32.7	28.6	31.7	.002
Female							
Sexual functioning	51.8	48.2	50.0	35.2	30.3	29.9	< .001
Vaginal dryness	35.5	39.5	38.8	33.3	29.9	35.1	.21
Pain during intercourse	23.6	21.5	20.7	22.9	16.9	20.0	.67

n=990
TME, 5x5Gy

RSCL: Rotterdam Symptom Check List

Marijnen CA et al. J Clin Oncol 2005

Effect of neoadjuvant treatment

	PRT+			PRT-			*P*
	3	12	24	3	12	24	
Male							
Sexual functioning	46.2	46.4	47.4	40.3	39.4	40.8	.004
Erection disorders	43.4	52.6	53.9	44.2	45.3	47.1	.03
Ejaculation disorders	34.1	39.1	42.5	32.7	28.6	31.7	.002
Female							
Sexual functioning	51.8	48.2	50.0	35.2	30.3	29.9	< .001
Vaginal dryness	35.5	39.5	38.8	33.3	29.9	35.1	.21
Pain during intercourse	23.6	21.5	20.7	22.9	16.9	20.0	.67

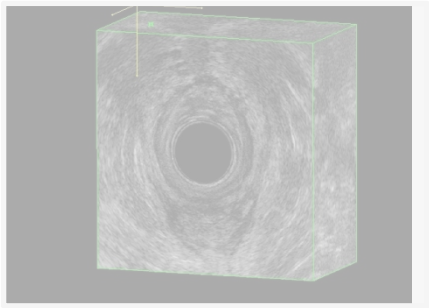
n=990
TME, 5x5Gy

RSCL: Rotterdam Symptom Check List

Marijnen CA et al. J Clin Oncol 2005

QoL after Rectal Surgery

- Anastomosis?
- Neo-/adjuvant treatment?
- Colostomy?



Stadtspital Triemli

RSCL: Rotterdam Symptom Check List

Sphincter-preservation vs. APR

23% der Patienten nach APR

Hochgradigen psychischen Störungen

Devlin HB et al. Br Med J 1971

QoL: APR vs. AR

11 Studies, non-randomized, n=1412

THE COCHRANE COLLABORATION®

Metaanalysis

6 Studies:	AR	=	APR
4 Studies:	AR	>	APR
1 Studies:	AR	>/<	APR

Meta-Analysis not possible!

Stadtspital Triemli

Pachler J et al. Cochrane Database Syst Rev. **2005**

QoL: APR vs. AR

35 Studies, non-randomized, **n=5127**

THE COCHRANE COLLABORATION®

Metaanalysis

14 Studies: AR = APR

21 Studies: AR >/< APR

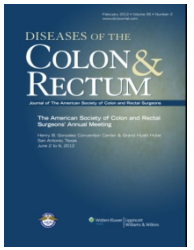
No conclusion possible!

Stadtspital Triemli

Pachler J et al. Cochrane Database Syst Rev. 2012

QoL: APR vs. AR

Multicenter Study, **n=253**, 13 Centers, 11 countries



Permanent colostomy with negativ effect in all dimensions **only in patients from southern Europe and arabic countries**

=> QoL after APR influenced by **social and cultural differences**

Stadtspital Triemli

Holzer B et al. Dis Colon Rectum 2005

QoL: APR vs. AR

11 studies, n = 1443
APR: 33%
QoL: up to 2 yrs postop.

Stadtspital Triemli

Cornish JA et al. Ann Surg Oncol 2007

QoL: APR vs. AR

	SF-36	QLQ C30	QLQ CR38	P/R	n	n (APR)	n (AR)	Erfassung
Allal, 2000		✓	✓	p	23	11	12	> 1 J. nach Chirurgie
Camilleri-Brennan, 2002	✓	✓	✓	r	106	53	53	> 1 J. nach Chirurgie
Gosselink 2005		✓	✓	r	122	51	71	–
Grumann 2001		✓	✓	p	73	23	50	1 J. nach Chirurgie
Guren 2005		✓	✓	r	319	90	229	> 1 J. nach Chirurgie
Jess 2002	✓			r	40	14	26	20.1 Monate
Kuzu 2002	✓			r	178	75	103	> 1 J. nach Chirurgie
Rauch 2004		✓	✓	r	121	53	66	–
Schmidt 2005			✓	p	249	46	203	> 1 J. nach Chirurgie
Sideris 2005		✓	✓	r	132	42	90	–
Vironen 2006	✓			r	82	28	54	> 1 J. nach Chirurgie
Total	**4**	**7**	**8**		**1,443**	**486**	**957**	

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QoL: APR vs. AR

	Studien	n (APR)	n (AR)	P - Wert
QLQ C30				
Global health	8	369	774	0.68
Physical	7	279	545	0.45
Role	8	369	774	0.31
Cognitive	6	226	479	**<0.001**
Emotional	6	226	479	**<0.001**
Social	8	369	774	0.19
Fatigue*	7	279	545	0.31
Pain*	7	346	724	0.30
Nausea*	5	203	442	0.68
Dyspnoea*	5	203	429	0.99
Insomnia*	7	279	545	0.89
Appetite loss*	5	203	442	0.28
Constipation*	5	217	452	0.10
Diarrhoea*	7	316	708	1
Financial difficulties	5	203	442	0.42

Pro APR

Cornish JA et al. Ann Surg Oncol 2007

QoL: APR vs. AR

	Studien	n (APR)	n (AR)	P value
QLQ CR38				
Body image	5	217	452	0.17
Sexual function	5	247	454	**0.01**
Sexual enjoyment	4	151	221	0.30
Future perspective	5	179	276	**0.002**
Micturition problems*	6	270	505	1.00
GIT symptoms*	6	270	505	0.69
Weight loss*	4	194	402	0.06
Male sexual problems*	4	202	359	0.02

Pro AR

Pro APR

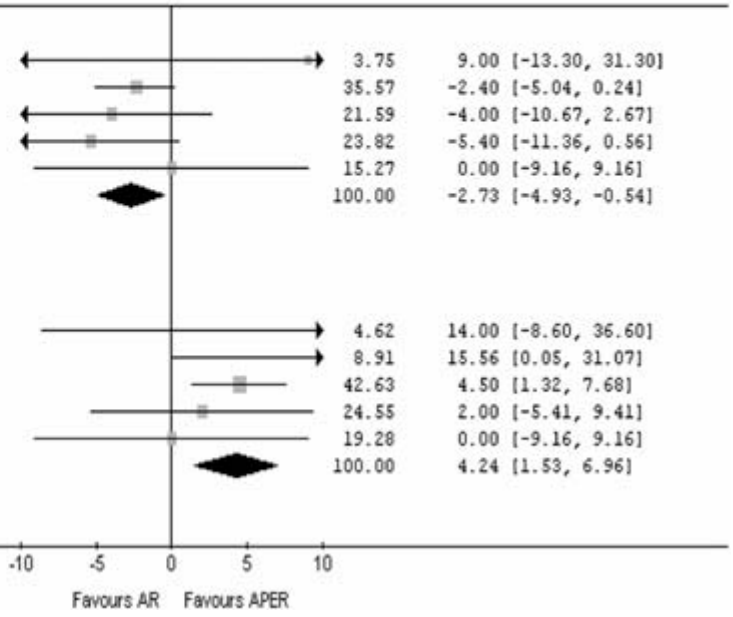
Stadtspital Triemli

Cornish JA et al. Ann Surg Oncol 2007

QoL: APR vs. AR

Review: Quality of Life in Anterior Resection vs Abdominoperineal resection
Comparison: 13 CR38 APER vs AR sexual function and future perspective
Outcome: 01 APER vs AR

Study or sub-category	N	APER Mean (SD)	N	AR Mean (SD)	WMD (random) 95% CI	Weight %	WMD (random) 95% CI
02 Sexual Function							
Allal	11	27.00(32.00)	11	18.00(20.00)		3.75	9.00 [-13.30, 31.30]
Camilleri-Brennan	53	13.10(5.20)	53	15.50(8.33)		35.57	-2.40 [-5.04, 0.24]
Gosselink	51	20.00(16.75)	71	24.00(20.75)		21.59	-4.00 [-10.67, 2.67]
Guren	90	19.70(24.00)	229	25.10(25.50)		23.82	-5.40 [-11.36, 0.56]
Sideris	42	17.00(25.00)	90	17.00(25.00)		15.27	0.00 [-9.16, 9.16]
Subtotal (95% CI)	247		454			100.00	-2.73 [-4.93, -0.54]
Test for heterogeneity: Chi² = 2.38, df = 4 (P = 0.67), I² = 0%							
Test for overall effect: Z = 2.44 (P = 0.01)							
04 Future perspective							
Allal	10	80.00(23.00)	12	66.00(31.00)		4.62	14.00 [-8.60, 36.60]
Grumann	23	66.67(30.25)	50	51.11(33.78)		8.91	15.56 [0.05, 31.07]
Camilleri-Brennan	53	69.20(8.33)	53	64.70(8.35)		42.63	4.50 [1.32, 7.68]
Gosselink	51	74.00(16.75)	71	72.00(25.00)		24.55	2.00 [-5.41, 9.41]
Sideris	42	67.00(25.00)	90	67.00(25.00)		19.28	0.00 [-9.16, 9.16]
Subtotal (95% CI)	179		276			100.00	4.24 [1.53, 6.96]
Test for heterogeneity: Chi² = 3.96, df = 4 (P = 0.41), I² = 0%							
Test for overall effect: Z = 3.06 (P = 0.002)							



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Cornish JA et al. Ann Surg Oncol 2007

QoL: APR vs. AR

	Studien	n (APR)	n (AR)	P value
SF–36				
General quality of life	4	170	236	0.22
Physical function	4	170	236	**<0.001**
Role function	4	170	236	**<0.006**
Social function	4	170	236	0.30
Bodily pain	4	170	236	**0.005**
Mental health	4	170	236	0.18
Role (emotional)	3	156	210	0.29
Vitality	4	170	236	**0.003**

Pro AR

Stadtspital Triemli

Cornish JA et al. Ann Surg Oncol 2007

Conclusions

Rectal function: determined by

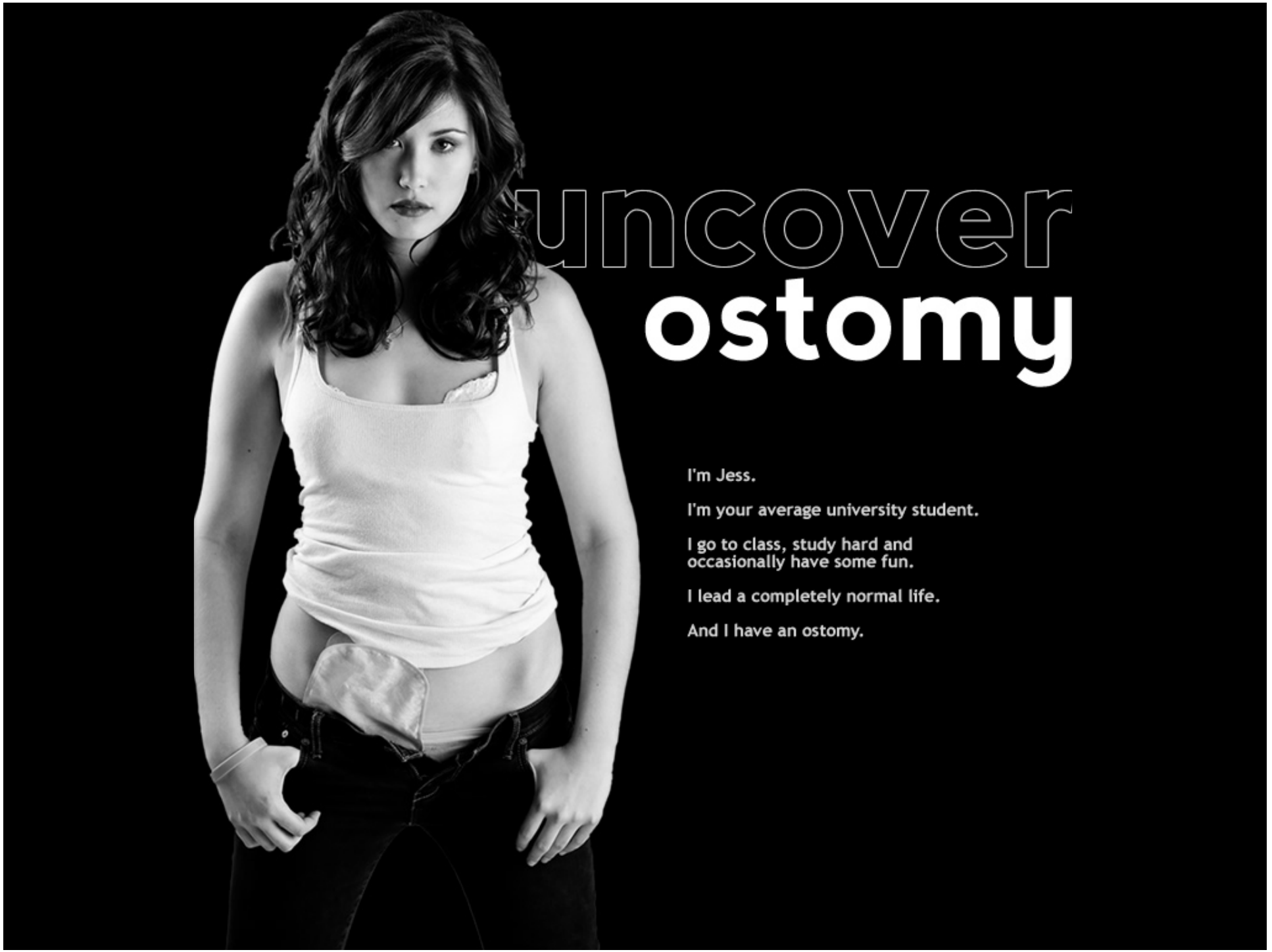
- reconstruction (CAA/ISR)

- RT

Functional impact => QoL??

APR: Data on QoL inconclusive

Counseling on individual basis


uncover
ostomy
I'm Jess.
I'm your average university student.
I go to class, study hard and
occasionally have some fun.
I lead a completely normal life.
And I have an ostomy.