Parastomal Hernia:
the ultimate challenge to quality of life

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HeSRU
EXETER SURGICAL HEALTH SERVICES RESEARCH UNIT

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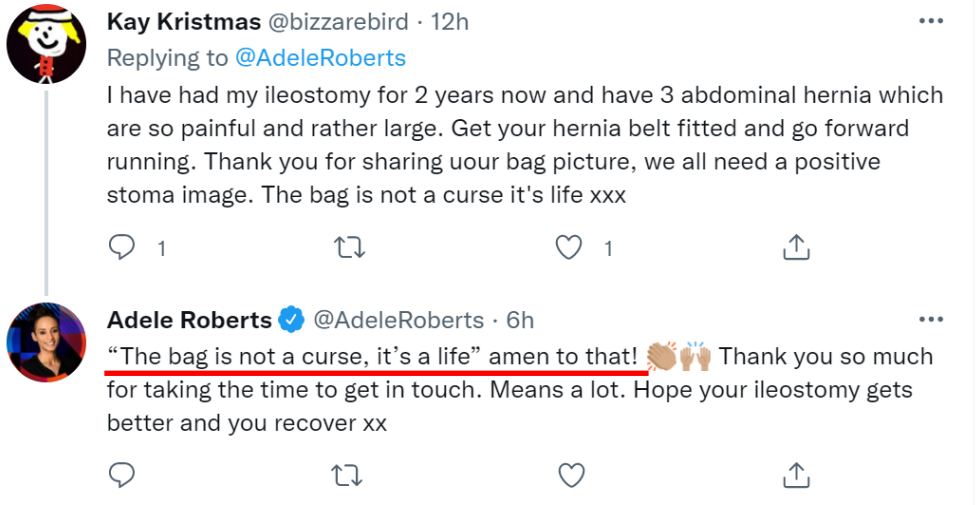
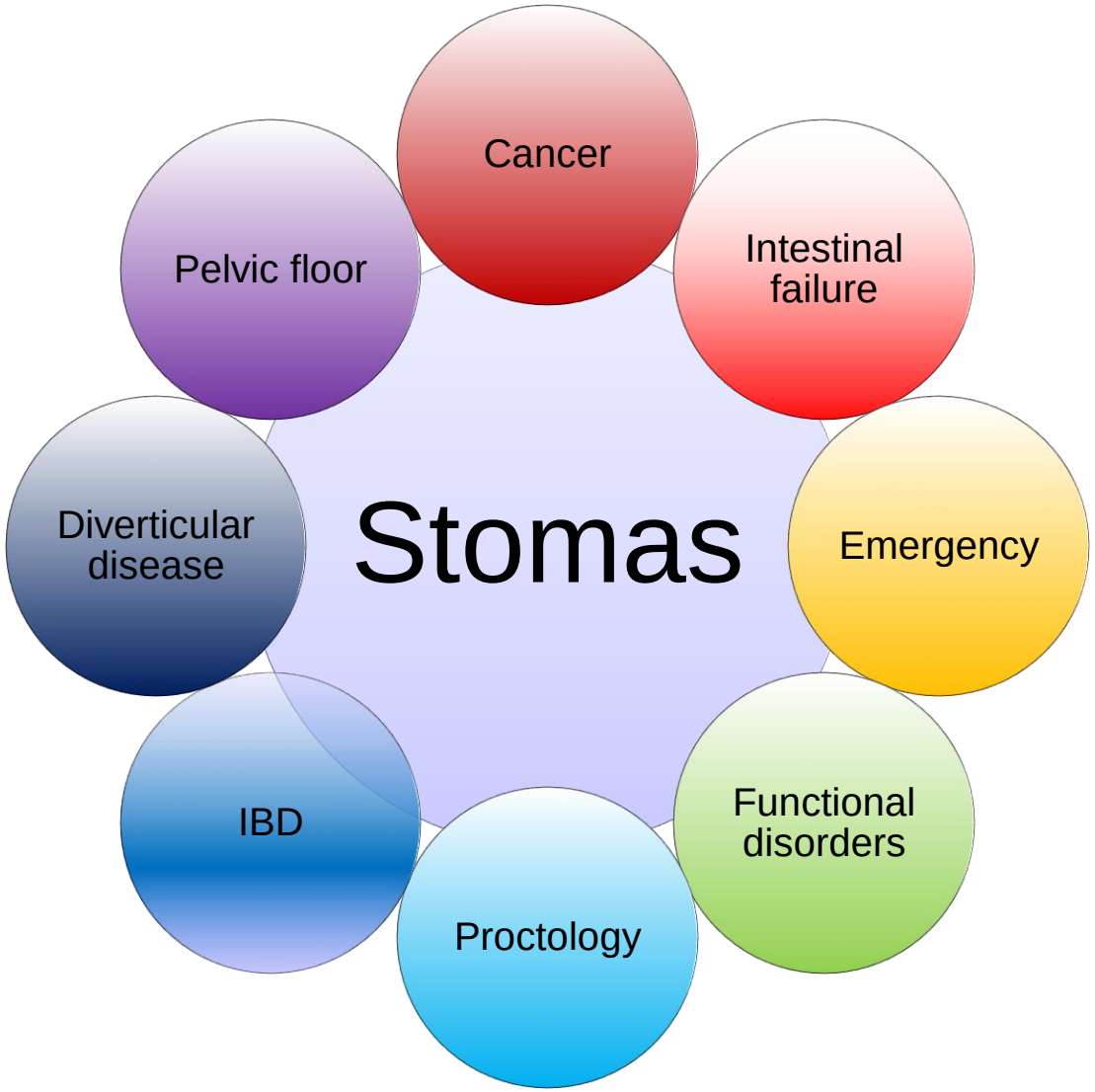
Why are parastomal hernias important?

STOMAS ARE THE COMMON GROUND





PARASTOMAL HERNIA

Hernia
DOI 10.1007/s10029-013-1162-z

ORIGINAL ARTICLE

European Hernia Society classification of parastomal hernias

M. Śmietański · M. Szczepkowski · J. A. Alexandre · D. Berger · K. Bury · J. Conze · B. Hansson · A. Janes · M. Miserez · V. Mandala · A. Montgomery · S. Morales Conde · F. Muysoms

Definition of a parastomal hernia

Following the EHS definition of ventral hernia (Any abdominal wall gap with or without a bulge in the area of a postoperative scar perceptible or palpable by clinical examination or imaging [1]), PH is an abnormal protrusion of the contents of the abdominal cavity through the abdominal wall defect created during placement of a colostomy, ileostomy or ileal conduit stoma [3]. It should be distinguished from local stoma problems without a hernia sac, such as a mucosal prolapse or a Siphon loop, which is a subcutaneous folding of the excess bowel length at the stoma.

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PARASTOMAL HERNIA

Surgical repair of parastomal bulging: a retrospective register-based study on prospectively collected data doi:10.1111/codi.15197

M. Krogsgaard*,† , I. Gögenur‡, F. Helgstrand‡, R. M. Andersen*,†, A. K. Danielsen†,§ , A. Vinther¶,**, T. W. Klausen††, J. Hillingsø*, B. M. Christensen* and T. Thomsen§,‡‡

The classification of parastomal bulging comprises patients with a 'true' parastomal hernia and/or subcutaneous prolapse; it is, however, difficult to differentiate the two clinically [1,2,4,5]. Patients' symptoms are likely to be overlapping [1,5] and affect their everyday lives [6] and health-related quality of life [7].

HOW COMMON IS IT?

- ~1200000 ostomates
- 20000 new stomas per year
- 50% will be permanent
  (Black P, Br J Nurs 2009)

- 25% prevalence of clinical PSH
- Mean time to onset 18/12
  (Ripoche J Visc Surg 2011)

HOW COMMON IS IT?

- An inevitability?
- Depends upon follow up:
  - Duration (most within 2yr)
  - Risk life long
  - Type – clinical v radiological
- Depends upon stoma type
  - colostomy > ileostomy
  - end > loop

Kind permission from Filip Muysoms, Ghent

CLASSIFICATION OF PSH

- Allows common language
- Facilitates comparisons
- Classifications:
  - Clinical
  - Imaging
  - Intra-operative

Table 1 Description of previous parastomal hernia classification proposals

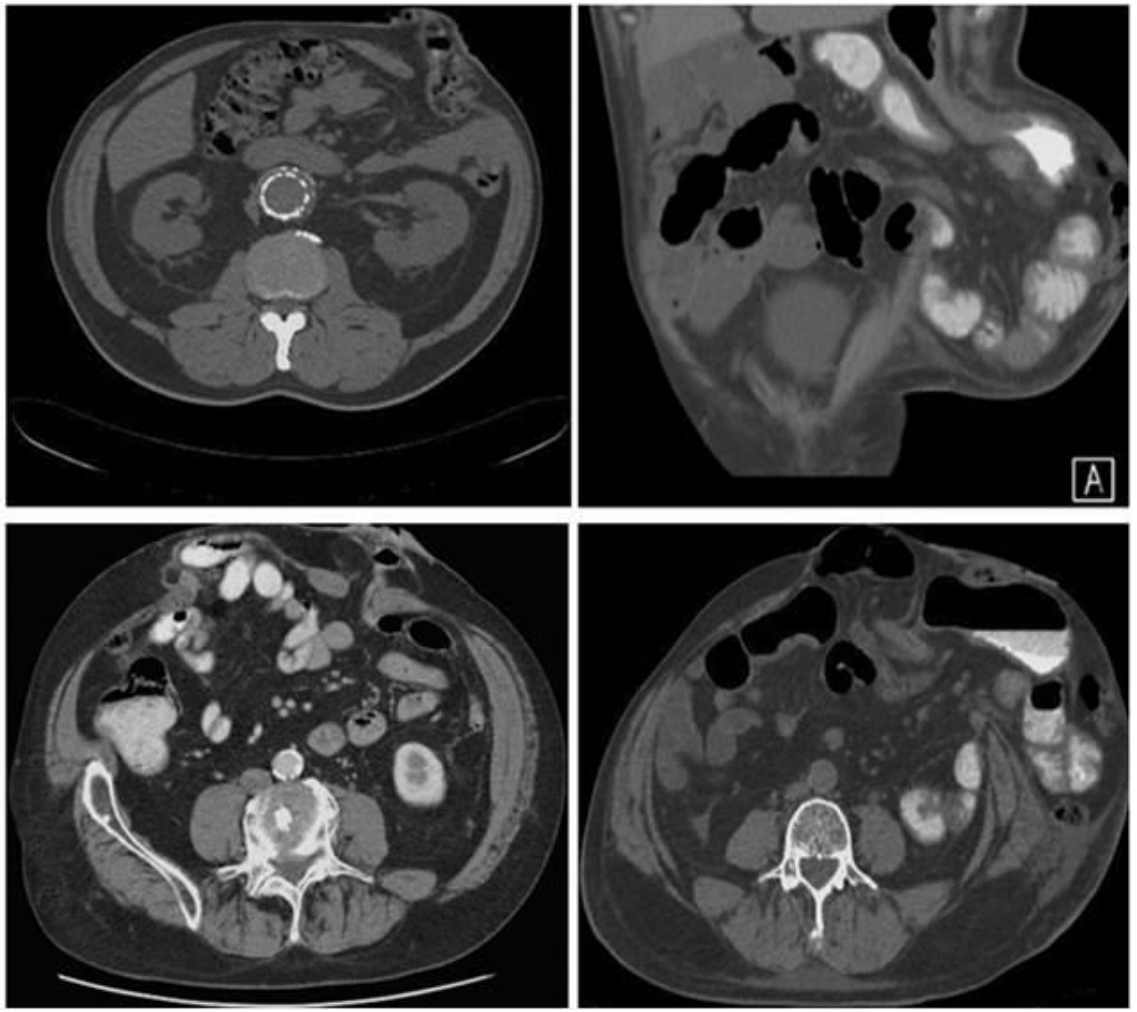
Author (year)	Classification type	Classification based on	Number of subclasses	Clinical validation
Devlin [5]	Intraoperative	Intraoperative findings	4	Yes
Rubin [4]	Intraoperative	Intraoperative findings	4	No
Moreno-Matias [6]	Radiological	CT	5	Yes
Gil, Szczepkowski [Bielanski Hospital] [8]	Clinical	Physical examination	4	Yes

Smietanski et al Hernia 2013

EHS CONSENSUS 2013

EHS Parastomal Hernia Classification		Small ≤ 5 cm	Large > 5 cm
Concomitant incisional hernia?	No	I	III
	Yes	II	IV

P ☐ R ☐



Smietanski et al Hernia 2013

COMPLEX SITUATION?

- “Complex abdominal wall hernia”

  Multiple abdominal wall herniae
  incisional & parastomal

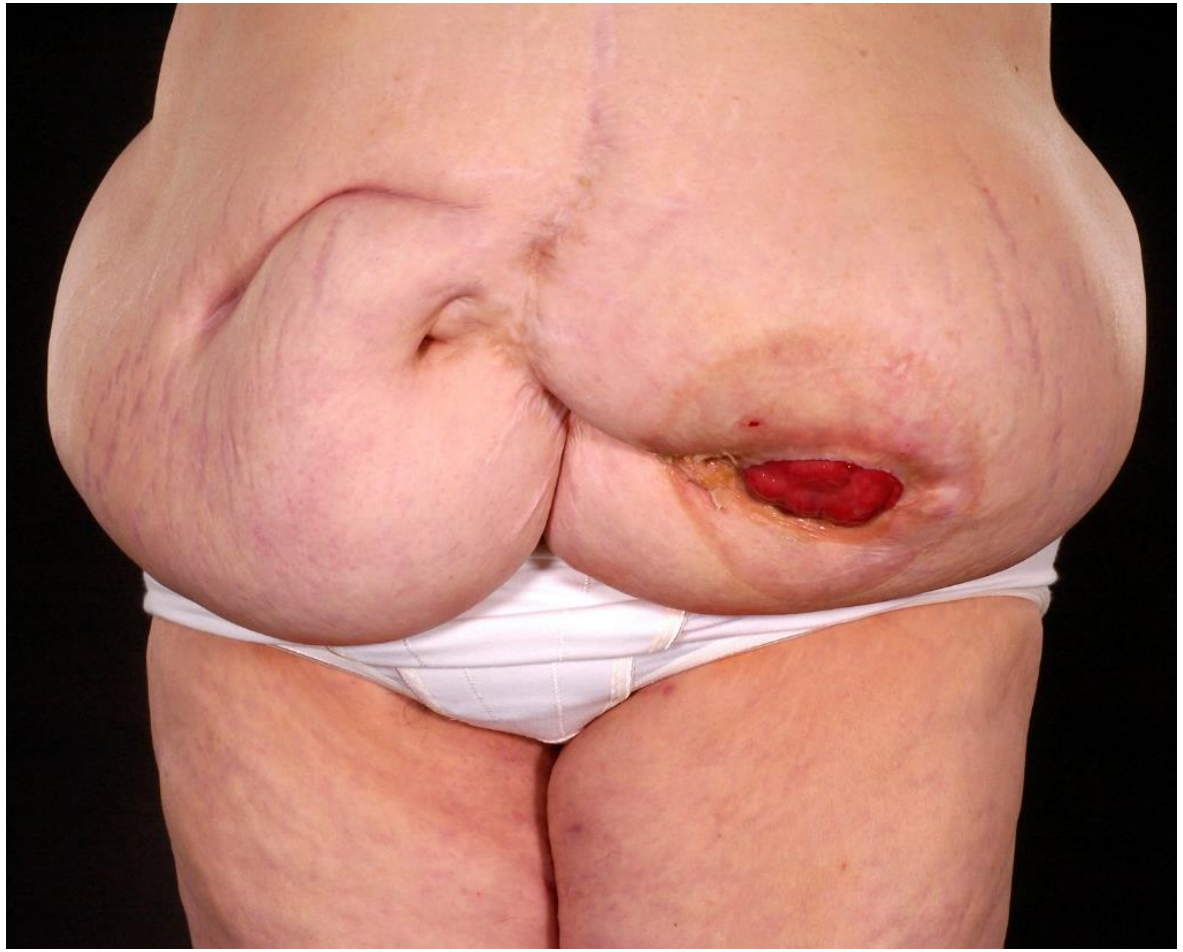
  Concurrent intestinal disease
  (e.g. Crohn’s / cancer)

  Fistula

  Infection

  Co-morbidity / obesity

  Domain loss



PROBLEM? TRADITIONAL SURGICAL DOGMA

- *"Most parastomal hernias are minimally symptomatic…"* RK Pearl, WJS 1989
- Cook County experience 1976 - 1995: Park et al DCR 1999

Table 2.
Overall Incidence of the Different Types of Complications

Early Complications	No. of Complications	Incidence (%)	Late Complications	No. of Complications	Incidence (%)
Skin irritation	199	12.31	Skin irritation	92	5.69
Poor location	111	6.87	Prolapse	28	1.73
Parital necrosis	83	5.14	Stenosis	27	1.67
Retraction	73	4.52	Parastomal hernia	19	1.18
Parastomal separation	64	3.96	Pseudoepithelial hyperplasia	18	1.11
Parastomal abcess	35	2.17	Retraction	17	1.05
Bleeding	12	0.74	Allergy	5	0.31
Complete necrosis	6	0.37	Perforation	1	0.06
Evisceration	6	0.37			
Stenosis	4	0.25			
Pseudoepithelial hyperplasia	4	0.25			
Protruding sigmoid	2	0.12			
Allergy	1	0.06			
Total	600			207	

PROBLEM? ASK THE PATIENT!

France

Ripoche et al J Visc Surg 2011

- Only 24% are asymptomatic
- Up to 30% require surgery

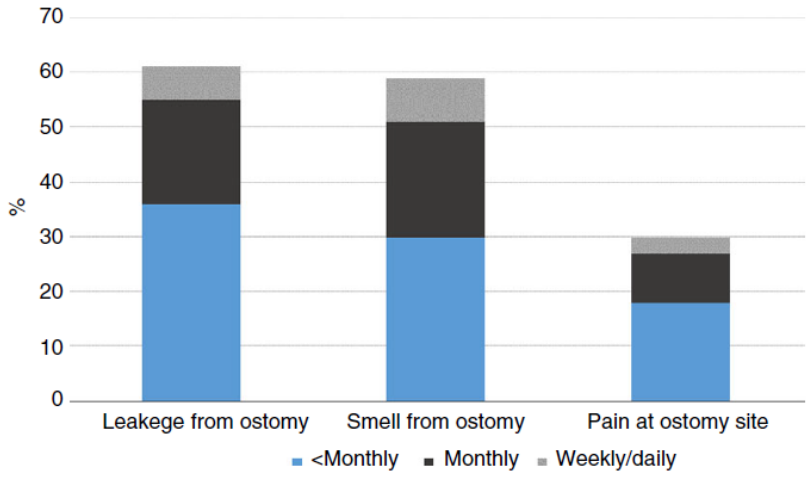
Table 3 Symptoms associated with PSH.

Symptoms	Frequency (%)	*n*
Pain	35	71
Difficulty with stomal appliance	28	57
Leakage	27	55
Skin irritation	22	45
Difficulty with irrigation (137 stoma pts.)	24	33
No particular symptoms	24	48

Denmark

Feddern et al CODI 2015

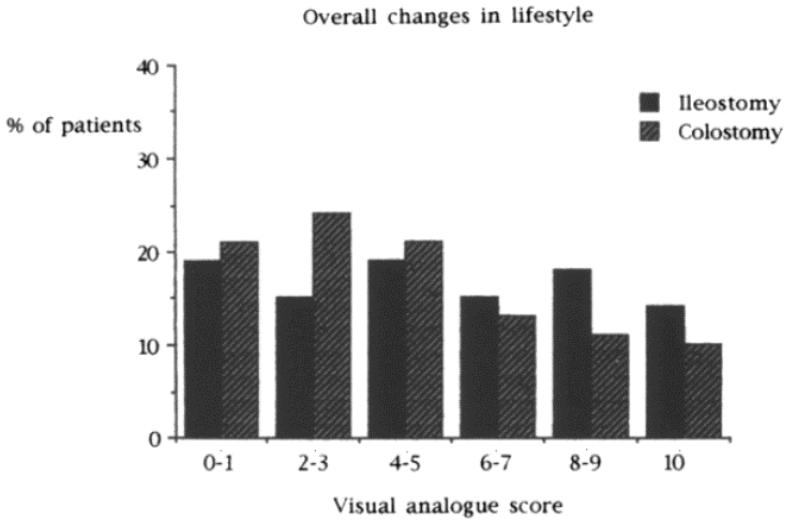
- PSH 57% of 644 ostomates



UK

Nugent et al DCR 1999

- > 40% incidence - impact ++



NEGATIVE IMPACT ON QOL

Parastomal Hernia: Impact on Quality of Life?

Sven M. van Dijk[1] · Lucas Timmermans[1] · Eva B. Deerenberg[1] · Bas Lamme[2] · Gert-Jan Kleinrensink[3] · Johannes Jeekel[3] · Johan F. Lange[1]

Table 5 Multivariate analysis

Effect of parastomal hernia on SF-36, EQ-5D and BIQ components (scale)	Mean difference (95 % confidence interval)	*p* value
Equation 5D pain (0–1)	0.25 (0.072 to 0.425)	*0.006*
SF36 physical functioning (0–100)	−10.2 (−19.5 to −0.858)	*0.033*
SF35 Role physical (0–100)	−13.4 (−30.1 to 3.2)	0.113
SF36 Bodily pain (0–100)	−11.3 (−19.8 to −2.8)	*0.009*
SF36 General health (0–100)	−9.0 (−16.6 to −1.4)	*0.021*
SF36 physical component score (0–100)	−4.8 (−8.8 to −0.8)	*0.020*
BIQ Shame of scar (1–4)	−0.4 (−0.6 to −0.1)	*0.010*
BIQ Describe the scar (1–10)	−0.4 (−0.8 to 0.1)	0.101

Data shown are differences between PH and no-PH group, adjusted for age, BMI, length of incision, and surgical complications

p values < 0.05 are shown in italics

World J Surg (2015) 39:2595–2601

PSH IMPACT ON QOL

Impact of a Parastomal Bulge on Quality of Life – A Cross-sectional Study of Patients From the Danish Stoma Database

Marianne Krogsgaard, MHS,†✉ Torquil Watt, DMSc,‡ Anne K. Danielsen, PhD,† Tobias Wirenfeldt Klausen, MSc,§ Anders Vinther, PhD,¶ Ismail Gögenur, DMSc,|| and Thordis Thomsen, PhD***

TABLE 2. Mean and Adjusted Mean Differences in Health-related Quality of Life (HRQoL) Scores Between Patients With and Without a Self-reported Parastomal Bulge

Scale/Subscale	Bulge (n = 693)	No Bulge (n = 565)	Linear Regression† Ref. No Bulge	Effect Size
SF-36	Mean (SD)	Mean (SD)	Adjusted Mean Difference (95% CI)	Cohens *d*‡
Physical Functioning	65 (28)	72 (30)	−5 (−8; −2)**	0.17
Role-Physical	57 (34)	67 (38)	−8 (−12; −4)***	0.25
Bodily Pain	72 (29)	75 (29)	−7 (−10; −3)***	0.23
General Health	56 (24)	60 (26)	−6 (−9; −3)***	0.23
Vitality	54 (25)	59 (25)	−7 (−10; −4)***	0.28
Social Functioning	78 (28)	82 (26)	−7 (−10; −4)***	0.26
Role-Emotional	66 (33)	74 (32)	−5 (−9; −1)**	0.16
Mental Health	72 (22)	75 (20)	−4 (−7; −2)***	0.21
SF-36 summary scores				
Physical Component summary	46 (10)	48 (11)	−3 (−4; −1)***	0.26
Mental Component summary	48 (12)	50 (11)	−2 (−4; −1)***	0.21
Stoma-QOL summary score	62 (23)	70 (20)	−9 (−12; −7)***	0.44

TABLE 3. Mean and Adjusted Mean Differences in Health-related Quality of Life (HRQoL) Among Patients With and Without a Parastomal Bulge, Presented Separately for Patients With an Underlying Malignant or Benign Diagnosis

	Malignant Diagnosis			Benign diagnosis			
Scale/Subscale	Bulge n = 417‡	No Bulge n = 300‡	Linear Regression¶ Ref. No Bulge	Bulge n = 276§	No Bulge n = 265§	Linear Regression¶ Ref. No Bulge	Interaction, Bulging Status and Diagnosis†
SF-36	Mean (SD)	Mean (SD)	Adjusted Mean Difference (95% CI)	Mean (SD)	Mean (SD)	Adjusted Mean Difference (95% CI)	*P*-value
Physical Functioning	69 (26)	74 (28)	−4 (−8; 0)	59 (30)	71 (30)	−7 (−12; −2)**	0.407
Role-Physical	61 (32)	70 (34)	−7 (−12; −2)**	51 (35)	64 (34)	−11 (−17; −4)**	0.600
Bodily Pain	77 (26)	80 (28)	−3 (−8; 1)	64 (31)	70 (29)	−10 (−15; −5)***	0.087
General Health	61 (24)	65 (24)	−5 (−9; −1)**	49 (24)	54 (27)	−7 (−12; −2)**	0.715
Vitality	59 (23)	63 (24)	−4 (−8; −1)*	47 (25)	55 (25)	−11 (−15; −6)***	0.081
Social Functioning	82 (26)	85 (25)	−3 (−7; 1)	71 (30)	79 (27)	−12 (−18; −7)***	0.019*
Role-Emotional	69 (31)	75 (32)	−4 (−9; 1)	62 (35)	72 (32)	−7 (−13; −1)*	0.582
Mental Health	76 (20)	77 (20)	−2 (−5; 2)	66 (23)	73 (20)	−8 (−12; −4)***	0.011*
SF-36 summary scores							
Physical Component summary	47 (9)	50 (10)	−2 (−4; −1)**	43 (10)	46 (11)	−3 (−5; −1)**	0.581
Mental Component summary	50 (11)	51 (11)	−1 (−3; 1)	45 (13)	48 (11)	−4 (−7; −2)***	0.038*
Stoma-QOL summary score	64 (23)	73 (20)	−9 (−12; −5)***	58 (23)	66 (21)	−10 (−13; −6)***	0.529

TABLE 4. Mean and Adjusted Mean Differences in Health-related Quality of Life (HRQoL) Among Patients With and Without a Parastomal Bulge, Presented Separately for Patients With a Colostomy or an Ileostomy

	Colostomy			Ileostomy			
Scale/Subscale	Bulge n = 533‡	No Bulge n = 315‡	Linear Regression¶ Ref No Bulge	Bulge n = 160§	No Bulge n = 250§	Linear Regression¶ Ref. No Bulge	Interaction, Bulging Status and Type of Stoma†
SF-36	Mean (SD)	Mean (SD)	Adjusted Mean Difference (95% CI)	Mean (SD)	Mean (SD)	Adjusted Mean Difference (95% CI)	*P*-value
Physical Functioning	65 (28)	70 (32)	−3 (−7; 1)	64 (28)	75 (26)	−9 (−14; −4)***	0.110
Role-Physical	59 (33)	67 (35)	−6 (−10; −1)*	51 (35)	67 (32)	−13 (−20; −6)***	0.214
Bodily Pain	74 (28)	77 (29)	−5 (−9; −1)*	63 (31)	73 (28)	−10 (−16; −5)***	0.063
General Health	58 (23)	63 (26)	−4 (−8; −1)*	49 (26)	56 (26)	−9 (−15; −3)**	0.248
Vitality	57 (24)	61 (25)	−5 (−8; −1)**	48 (26)	57 (24)	−12 (−17; −7)***	0.095
Social Functioning	80 (27)	83 (27)	−3 (−7; 1)	69 (31)	81 (26)	−14 (−20; −8)***	0.005**
Role-Emotional	68 (33)	73 (34)	−3 (−8; 2)	63 (35)	74 (30)	−10 (−16, −3)**	0.219
Mental Health	73 (21)	75 (20)	−2 (−5; 1)	67 (24)	74 (20)	−9 (−14; −5)***	0.017*
SF-36 summary scores							
Physical Component summary	46 (9)	48 (11)	−2 (−3; −0.3)*	43 (10)	48 (10)	−4 (−6; −2)***	0.141
Mental Component summary	48 (11)	50 (11)	−1 (−3; 1)	45 (13)	49 (11)	−5 (−7; −3)***	0.034*
Stoma-QOL summary score	64 (22)	71 (21)	−7 (−11; −4)***	55 (23)	68 (20)	−13 (−17; −9)***	0.095

TABLE 5. Mean and Adjusted Mean Differences in Health-related Quality of Life (HRQoL) Scores Between Patients With a Large (>10 cm) and a Small (< 10 cm) Self-reported Parastomal Bulge

Scale/Subscale	Large Bulge (n = 296)	Small Bulge (n = 397)	Linear Regression† Ref. Small Bulge	Effect Size
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↓QOL if have bulge

↓QOL if ileostomy

↓QOL benign disease

↓QOL if bulge >10cm

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Why do patients get parastomal hernias?

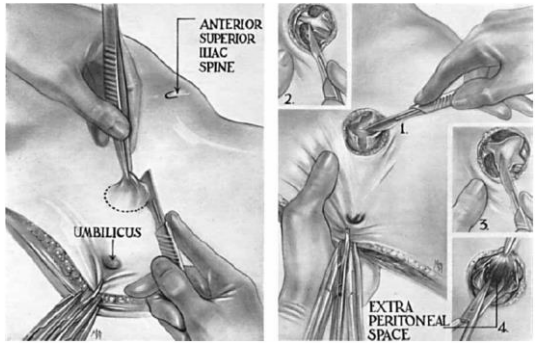
RISK FACTORS – PATIENT & TECHNICAL

- Patient factors:

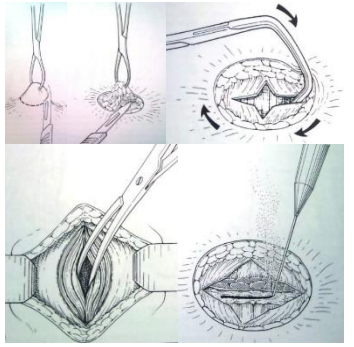
  - Age
  - Malnutrition
  - Obesity
  - Diabetes
  - Connective tissue disorders
  - Wound infection
  - Smoking
  - Previous laparotomies
  - Previous herniae
  - Steroids / immunosuppression
  - Benign v malignant disease
  - ↑ IAP – COPD / BPH / ascites

- Technical factors:
  - Emergency surgery
  - Stoma site (rectus)
  - Trephine size (shape?)
  - Trans or extraperitoneal
  - Fixation to fascia
  - Closure of lateral space
  - Laparoscopic surgery?
  - Prophylactic mesh
  - Avoidance of stoma

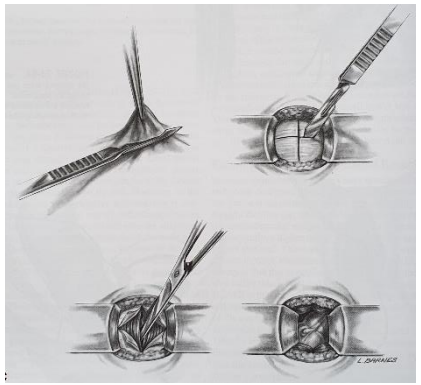
Goligher 1958



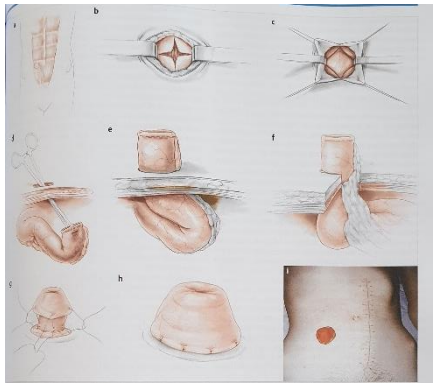
Keighley & Williams 2008



Corman 2013



Beck 2019



MAKING A STOMA

European Hernia Society guidelines on prevention and treatment of parastomal hernias

a. Extraperitoneal versus transperitoneal stoma construction

Statement: *There is insufficient evidence on the comparative risk of parastomal hernia development after construction of a stoma* via *the extraperitoneal or the transperitoneal route.*
Recommendation: *No recommendation can be made in preference of stoma construction through the extraperitoneal over the transperitoneal route.*
Quality of evidence: ☒☐☐☐
Strength of recommendation: *No*

b. Stoma construction at a lateral pararectus location versus a transrectus location

Statement: *There is insufficient evidence on the comparative risk of parastomal hernia development after construction of the stoma at a lateral pararectus location or a transrectus location.*
Recommendation: *No recommendation can be made in preference of stoma construction at a lateral pararectus location over a transrectus location.*
Quality of evidence: ☒☐☐☐
Strength of recommendation: *No*

c. Size of the fascial aperture

Statement: *There is insufficient evidence on the ideal size of the fascial aperture when constructing a stoma.*
Recommendation: *We suggest keeping the size of the fascial aperture as small as possible to allow passage of the intestine through the abdominal wall without causing ischemia.*
Quality of evidence: ☒☐☐☐
Strength of recommendation: *Weak*

Prevention and treatment of parastomal hernia: a position statement on behalf of the Association of Coloproctology of Great Britain and Ireland

Statement

1 There is insufficient evidence to ascertain whether the extraperitoneal route of stoma construction reduces PSH rate in comparison to the transperitoneal route.

2 There is insufficient evidence to support the assertion of lower PSH rates with stoma trephines within the rectus sheath compared to those lateral to the rectus sheath.

3 There is insufficient evidence to advocate LRAPS in preference to a rectus abdominis muscle splitting stoma trephine.

4 There is currently insufficient evidence to support the use of any particular shape of incision (either circular or cruciate) in terms of reducing the rate of PSH.

5 There is insufficient evidence to support claims regarding the absolute optimal size of the stomal trephine; however, it is intuitive to use the smallest trephine without causing bowel ischaemia.

Quality of evidence

Low

Strength of recommendation

None

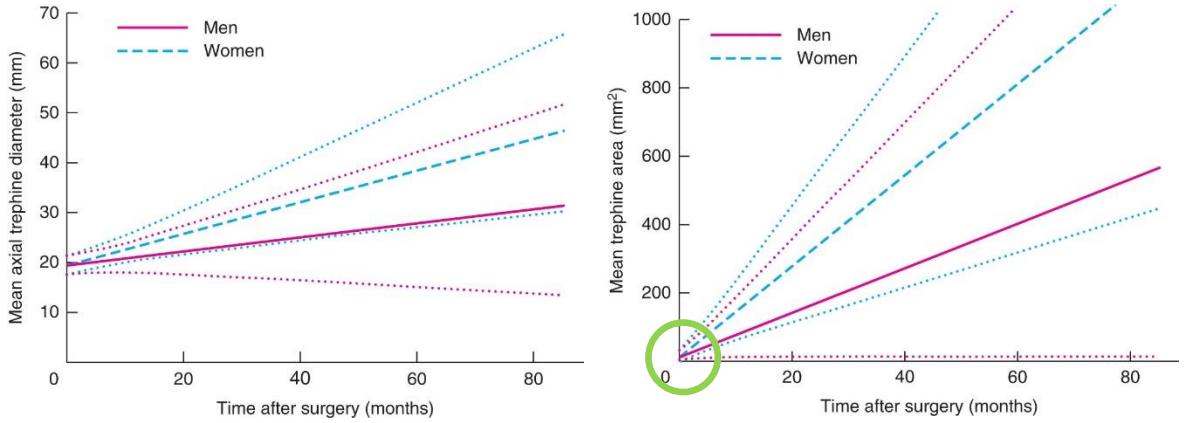
TREPHINE OVER TIME

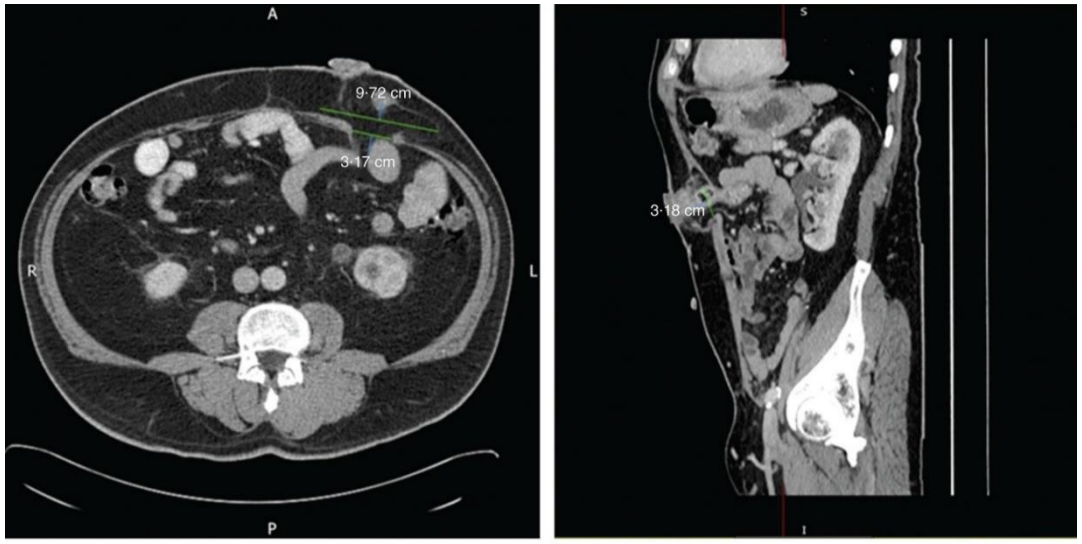
Radiological progression of end colostomy trephine diameter and area

K. K. Ho[1], T. Economou[2], N. J. Smart[3] and I. R. Daniels[3]

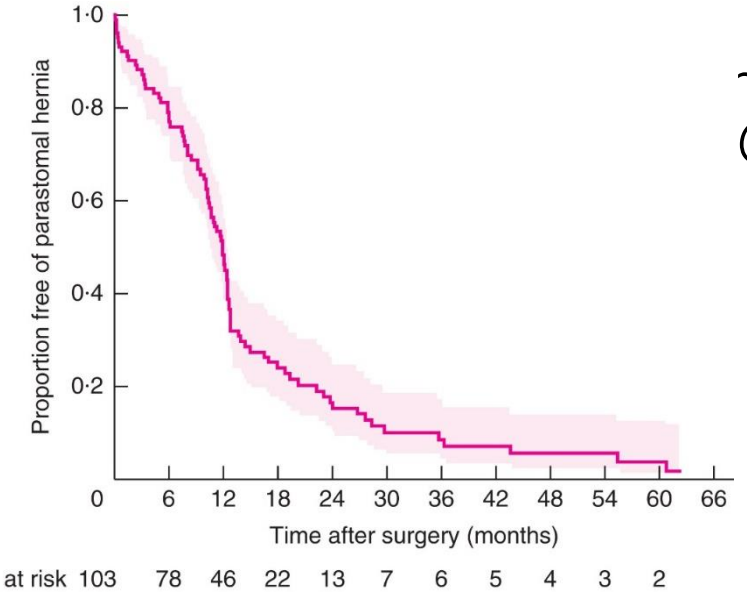
DOI: 10.1002/bjs5.50109 BJS Open

- Trephine larger in ♀ than ♂
- Rate of change over time ♀ > ♂ too.
- Shape & location of trephine not significant





a Axial trephine diameter **b** Sagittal trephine diameter



~ 85% PSH on CT @ 2 years

STUDY AIMS

CIPHER STUDY

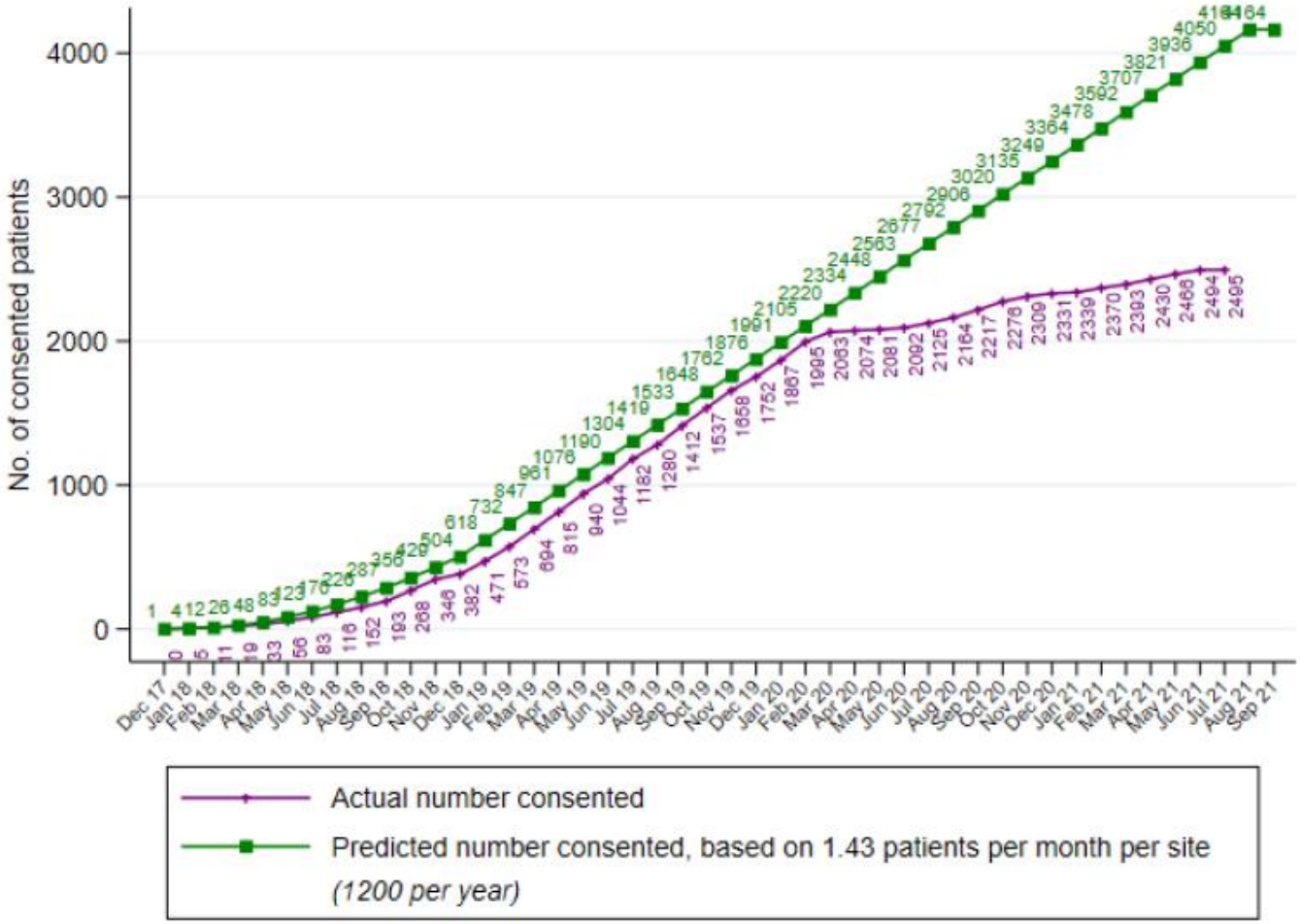
- PSH = incisional hernia related to a stoma

- Incidence of symptomatic & radiological PSH min 2 yr. FU

- Effects of key technical surgical steps during stoma formation

COVID CHANGES

CIPHER STUDY



Recruitment = 2498 patients

STUDY FUTURE

CIPHER
STUDY

- This is an OBSERVATIONAL Study – cumulative time exposed to risk is the key factor (person years)
- 2498 recruited, but follow up for longer….
- ~£250k NIHR HTA extension awarded

FOLLOW UP ONGOING

1ST Sept 2022

Cohort

CIPHER STUDY

		Tumour (n=1693)	Inflammatory Bowel Disease (n=285)	Functional & Diverticular (n=385)	Overall (n=2363)
Age (mean; SD)		66.9 (11.5)	45.5 (16.6)	59.1 (16.0)	63.1 (14.9)
Sex; n (%)	Male	1063/1693 (63%)	152/285 (53%)	148/385 (38%)	1363/2363 (58%)
	Female	630/1693 (37%)	133/285 (47%)	237/385 (62%)	1000/2363 (42%)
Smoking status; n (%)	Current smoker	155/1689 (9%)	28/284 (10%)	73/384 (19%)	256/2357 (11%)
Diabetes type; n (%)	Type 1	17/241 (7%)	5/23 (22%)	5/46 (11%)	27/310 (9%)
	Type 2	224/241 (93%)	18/23 (78%)	41/46 (89%)	283/310 (91%)
Therapeutic oral or injected corticosteroids; n (%)	Yes	46/1689 (3%)	113/284 (40%)	29/384 (8%)	188/2357 (8%)
Immuno-suppressive medication; n (%)	Yes	15/1689 (1%)	36/283 (13%)	7/384 (2%)	58/2356 (2%)
Disease modifying agents; n (%)	Yes	33/1689 (2%)	120/283 (42%)	20/384 (5%)	173/2356 (7%)
Previous abdominal surgery; n (%)		430/1689 (25%)	0/13 (0%)	0/24 (0%)	678/2357 (29%)
Abdominal wall hernia; n (%)		131/1689 (8%)	15/284 (5%)	34/384 (9%)	180/2357 (8%)
Any muscular or connective tissue disorder; n (%)		172/1689 (10%)	39/284 (14%)	82/384 (21%)	293/2357 (12%)
Frailty score; median (IQR)		2 (2, 3)	3 (2, 3)	3 (2, 4)	2 (2, 3)

Cohort

CIPHER STUDY

		Tumour (n=1693)	Inflammatory Bowel Disease (n=285)	Functional & Diverticular (n=385)	Overall (n=2363)
Small bowel resection; n (%)		19/1693 (1%)	10/285 (4%)	8/385 (2%)	37/2363 (2%)
Colectomy - left; n (%)		496/169 (29%)	5/285 (2%)	48/385 (12%)	549/2363 (23%)
Colectomy - right; n (%)		37/1693 (2%)	24/285 (8%)	8/385 (2%)	69/2363 (3%)
Colectomy - subtotal or panproctocolectomy; n (%)		84/1693 (5%)	201/285 (71%)	20/385 (5%)	305/2363 (13%)
Hartmann's procedure; n (%)		203/1693 (12%)	4/285 (1%)	80/385 (21%)	287/2363 (12%)
Abdominoperineal excision / posterior exenteration; n (%)		523/1693 (31%)	7/285 (2%)	3/385 (1%)	533/2363 (23%)
Stoma formation; n (%)		585/1693 (35%)	87/285 (31%)	251/385 (65%)	923/2363 (39%)
Other; n (%)		234/1693 (14%)	35/285 (12%)	73/385 (19%)	290/2363 (12%)
Intended type of access used; n (%)	SILS	3/1640 (0%)	9/282 (3%)	3/379 (1%)	15/2301 (1%)
	Laparoscopic	1081/1640 (66%)	210/282 (74%)	254/379 (67%)	1545/2301 (67%)
	Robotic	125/1640 (8%)	3/282 (1%)	2/379 (1%)	130/2301 (6%)
	Open	412/1640 (25%)	58/282 (21%)	111/379 (29%)	581/2301 (25%)
	Trephine	19/1640 (1%)	2/282 (1%)	9/379 (2%)	30/2301 (1%)

Cohort

CIPHER STUDY

		Tumour (n=1693)	Inflammatory Bowel Disease (n=285)	Functional & Diverticular (n=385)	Overall (n=2363)
Route of stoma; n (%)	Trans-peritoneal	1322/1357 (97%)	224/228 (98%)	299/305 (98%)	1845/1890 (98%)
	Extra-peritoneal	35/1357 (3%)	4/228 (2%)	6/305 (2%)	45/1890 (2%)
Ileostomy: type of stoma formed; n (%)	End	110/608 (18%)	215/246 (87%)	29/110 (26%)	354/964 (37%)
	Loop	486/608 (80%)	25/246 (10%)	77/110 (70%)	588/964 (61%)
	Other or missing	12/608 (2%)	6/246 (2%)	4/110 (4%)	22/964 (2%)
Colostomy: type of stoma formed; n (%)	End	839/1014 (83%)	15/32 (47%)	180/267 (67%)	1034/1313 (79%)
	Loop	166/1014 (16%)	16/32 (50%)	64/267 (24%)	246/1313 (19%)
	Other or missing	9/1014 (1%)	1/32 (0%)	23/267 (9%)	33/1313 (2%)
Mesh used to reinforce the stoma trephine; n (%)		51/1617 (3%)	2/281 (1%)	4/375 (1%)	57/2273 (3%)

CT SCAN MEASUREMENTS

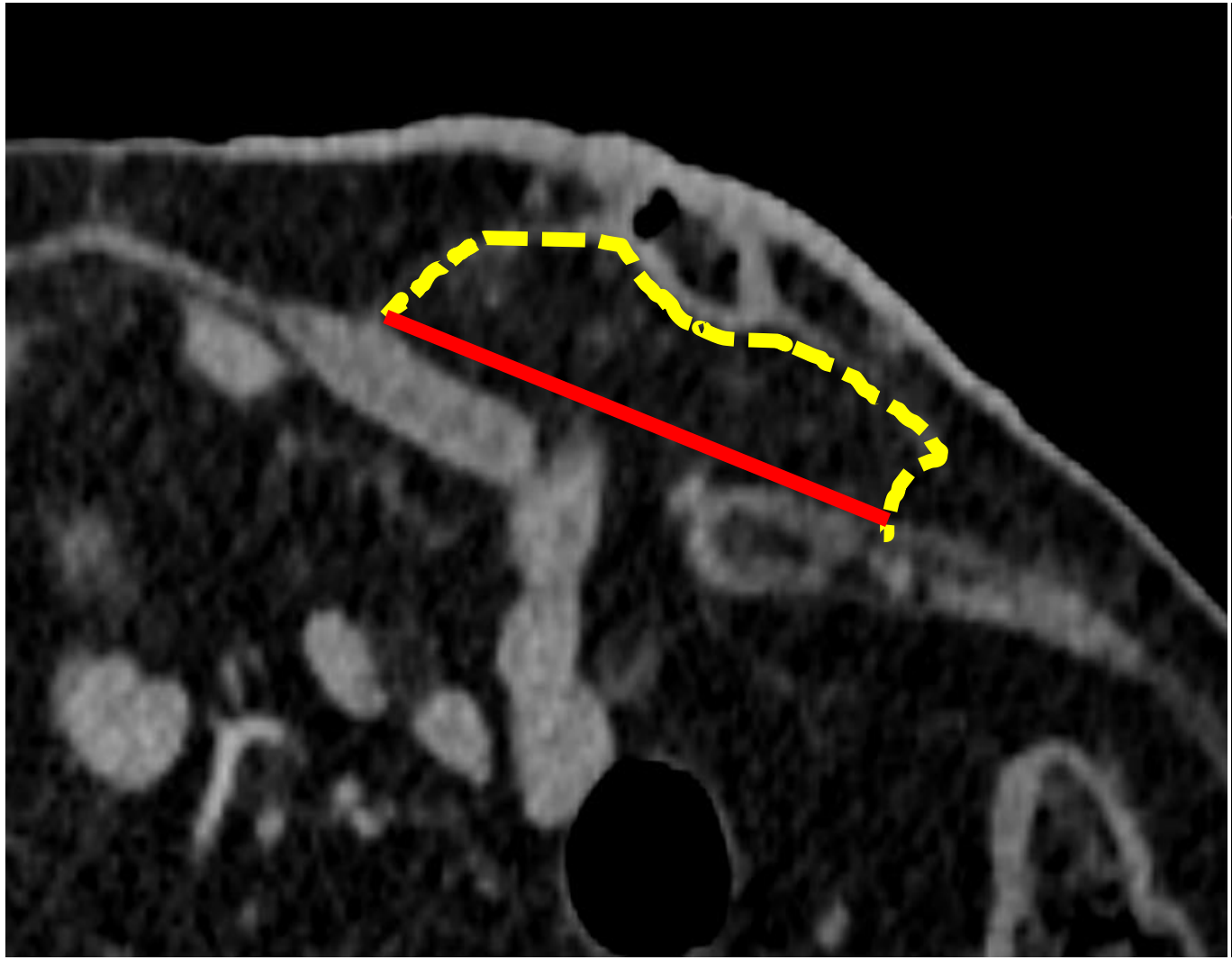
CIPHER STUDY

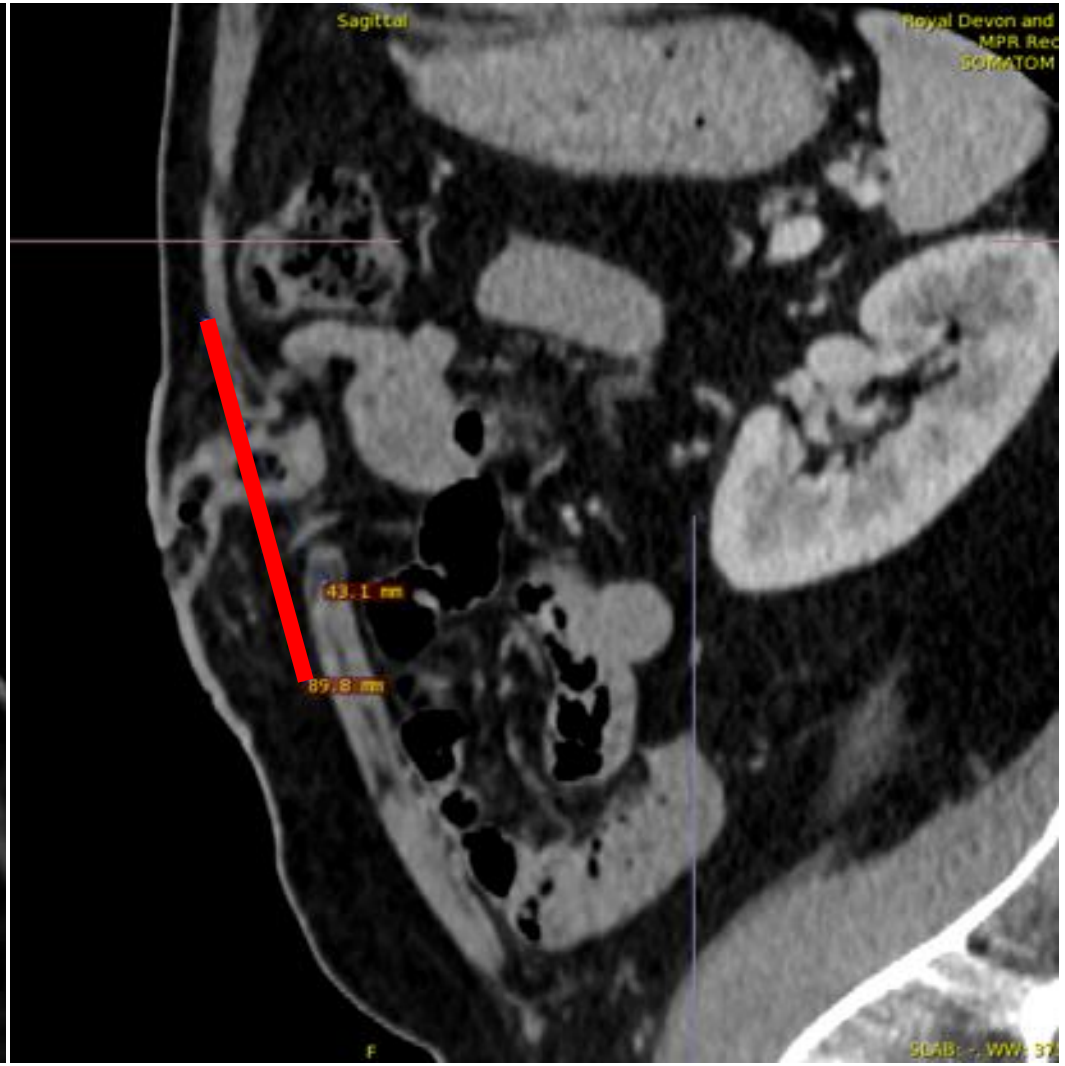
Trephine diameter

CT SCAN MEASUREMENTS

CIPHER STUDY

Sac diameter

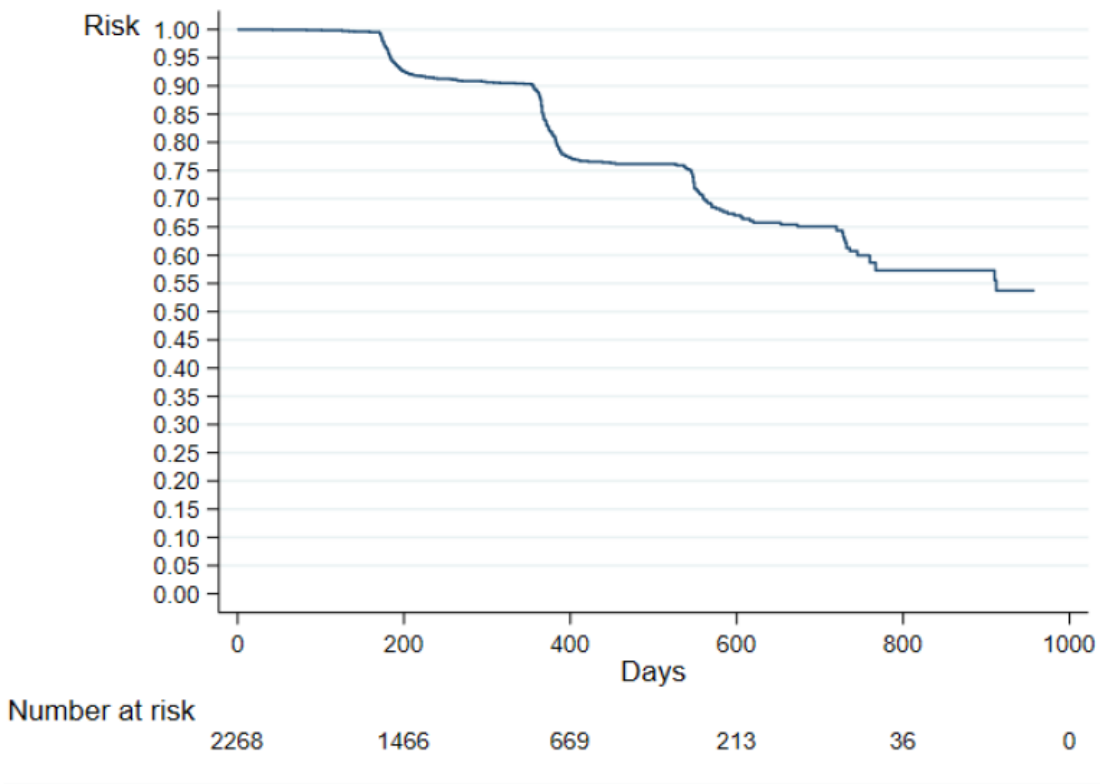




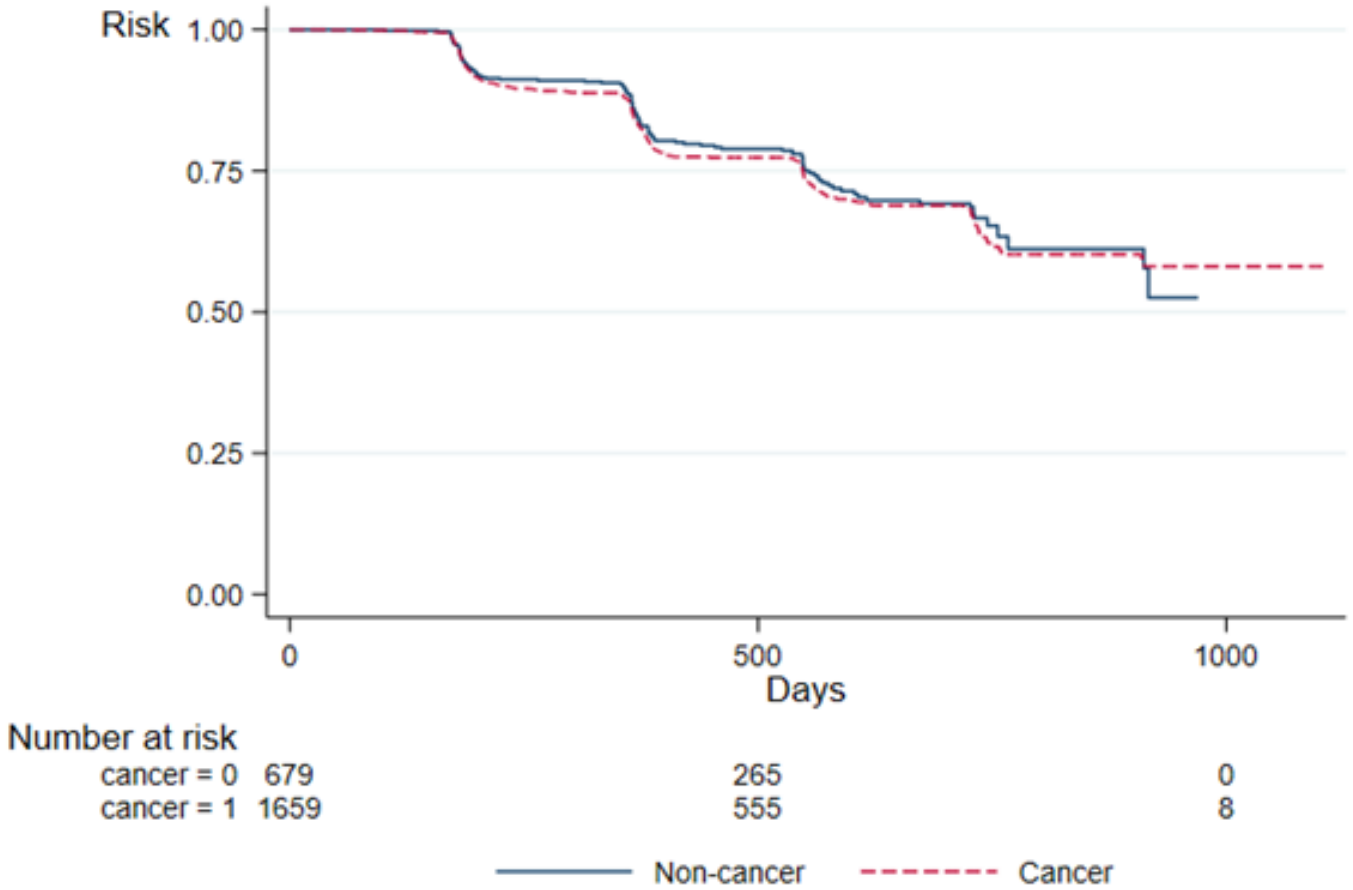
What we know so far…

CIPHER STUDY

Time to patient reported PSH development



Time to reported PSH by cancer/non-cancer



Mesh use is low (<3%)

CIPHER STUDY

Proposed comparisons of surgical technique items for primary outcome analyses

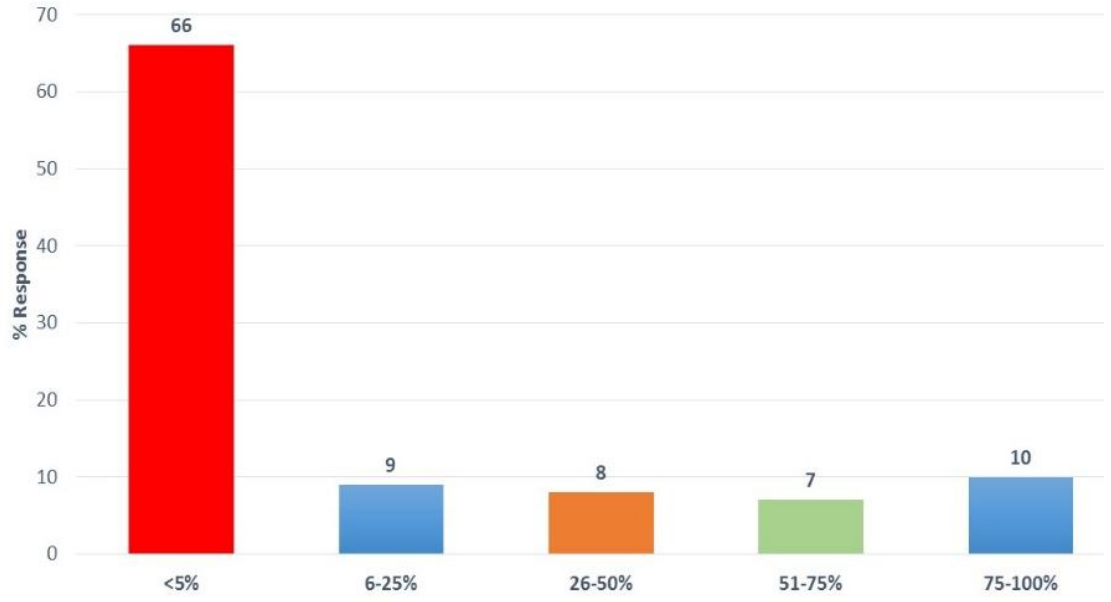
Surgical technique item	Comparison	Percentage	Ratio	Excluded	
Intended type of access used; n (%)	Minimally invasive Open	72% 26%	1 : 1.27	2%	
Type of stoma formed; n (%)	End Loop	58% 40%	1 : 1.45	2%	
Bowel used to form stoma; n (%)	Colon (descending/sigmoid) Ileum	53% 45%	1 : 1.18	2%	
Stoma site pre-marked; n (%)	Preserved with pen Preserved with suture	74% 24%	1 : 3.08	2%	
Anterior sheath: Shape of incision; n (%)	Cruciate or linear Circular	89% 11%	1 : 8.09	1%	✗
Posterior sheath: incision shape; n (%)	Linear (horizontal/vertical) Cruciate	52% 42%	1 : 1.24	5%	
Location of trephine; n (%)	Other than port site At port site	44% 28%	1 : 1.57	27%	
Sutures used to buttress incision; n (%)	No Yes	90% 10%	1 : 10.0	0%	✗
Stoma trephine = extraction site; n (%)	No Yes	93%) 7%)	1 : 13.3	0%	✗
Closure of deep layer; n (%)	Large bite closure Small bite closure	41% 28%	1 : 1.46	31%	

MESH USE NOT WIDESPREAD

A survey on practices for parastomal hernia prevention and repair among ESCP surgeons

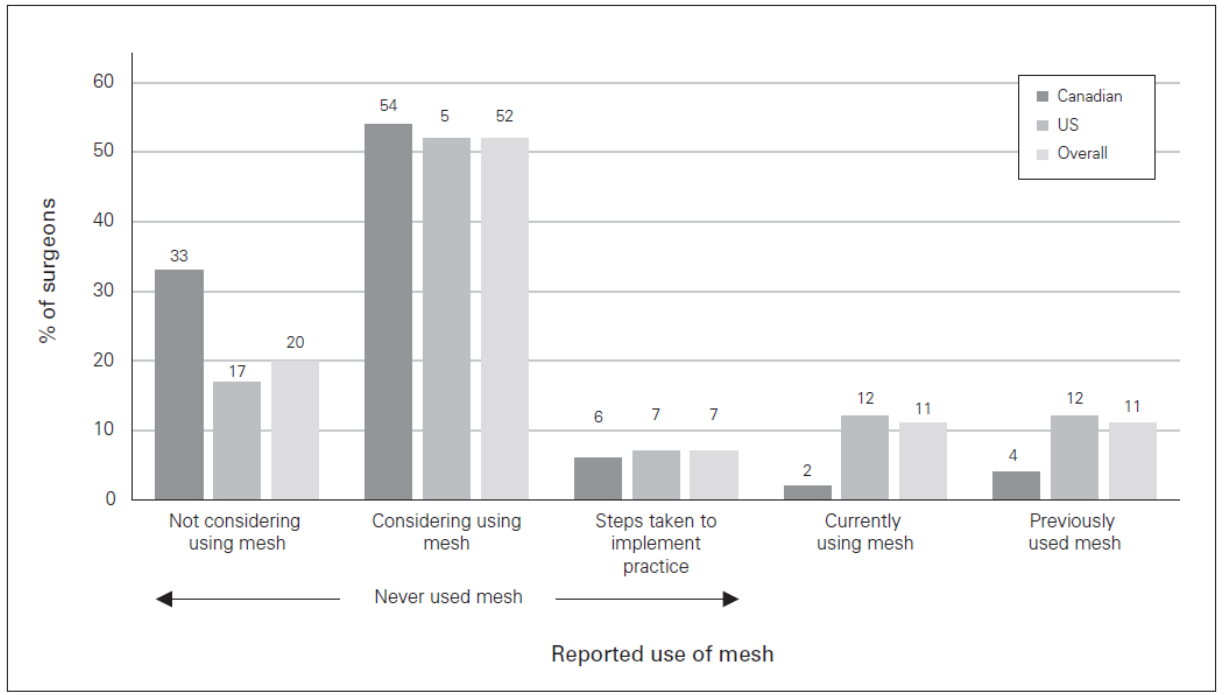
Hernia https://doi.org/10.1007/s10029-019-01921-z

How often respondents perform prophylactic mesh reinforcement of stoma at index operation

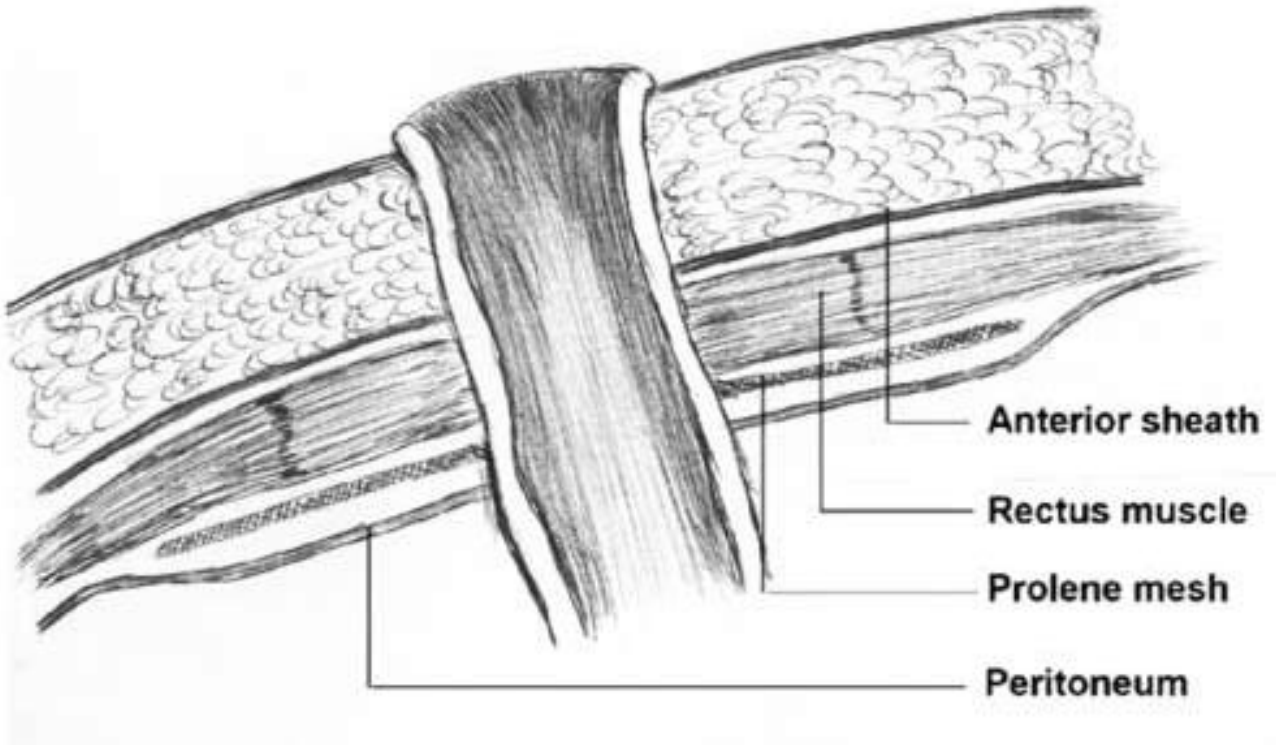


Do North American colorectal surgeons use mesh to prevent parastomal hernia? A survey of current attitudes and practice

Can J Surg, Vol. 62, No. 6, December 2019



PROPHYLACTIC MESH



PROPHYLACTIC MESH

European Hernia Society guidelines on prevention and treatment of parastomal hernias

Does the use of a prophylactic mesh during stoma construction reduce the incidence of parastomal hernias?

Statements: *High quality evidence supports the use of a prophylactic mesh during construction of a permanent end colostomy in elective surgery in reducing the incidence of parastomal hernia development.*
Recommendation: *It is recommended to use a prophylactic synthetic non-absorbable mesh when constructing an elective permanent end colostomy to reduce the parastomal hernia rate.*
Quality of evidence: ☒☒☒☒
Strength of recommendation: *Strong*
Recommendation: *No recommendation to use a prophylactic mesh can be made for ileostomies or ileal conduit stomas, nor for the use of synthetic absorbable or biological meshes.*
Quality of evidence: ☒☒☐☐
Strength of recommendation: *No*

Prevention and treatment of parastomal hernia: a position statement on behalf of the Association of Coloproctology of Great Britain and Ireland

Statement
The use of non-absorbable synthetic mesh may reduce the incidence of PSH in patients who have permanent end colostomy formation for cancer only during elective surgery.
There is insufficient evidence regarding
1 optimal mesh position within the abdominal wall (retromuscular *vs* intraperitoneal on-lay mesh)
2 use of biologic meshes
3 prophylactic mesh in emergency surgery
4 prophylactic mesh use for ileostomy/urostomy
5 indications for stoma other than cancer (e.g. inflammatory bowel disease/functional)
6 cost effectiveness
7 long-term data, although this is in progress. Results are expected in the next few years.
Recommendation
Prophylactic synthetic non-absorbable mesh may be used when constructing an elective permanent end colostomy for cancer only to reduce the risk of PSH development.
Quality of evidence
Moderate
Strength of recommendation
Weak

PROPHYLACTIC MESH

European Hernia Society guidelines on prevention and treatment of parastomal hernias

Prevention and treatment of parastomal hernia: a position statement on behalf of the Association of Coloproctology of Great Britain and Ireland

Cochrane Database of Systematic Reviews

Prosthetic mesh placement for the prevention of parastomal herniation

Cochrane Systematic Review - **Intervention** | Version published: 20 July 2018 **see what's new**

Cochrane Library

Quality of evidence

We found low-quality evidence favouring the insertion of a mesh into people having a stoma.

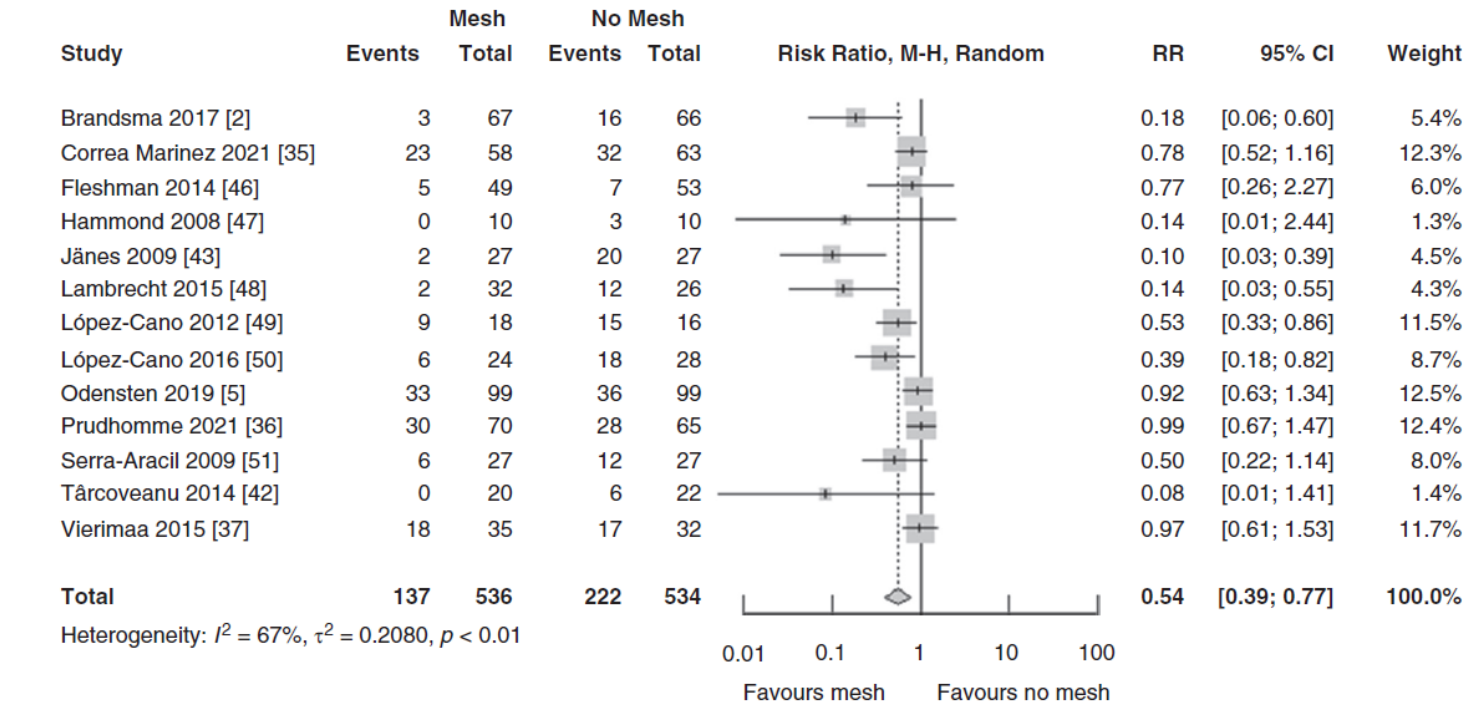
GOLD STANDARD EVIDENCE

DOI: 10.1111/codi.15849

SYSTEMATIC REVIEW

Use of prophylactic mesh during initial stoma creation to prevent parastomal herniation: a systematic review and meta-analysis of randomised controlled trials

Syed Mohiuddin[1] | William Hollingworth[1] | Niroshini Rajaretnam[2] | Barnaby C. Reeves[3] | Neil J. Smart[2]

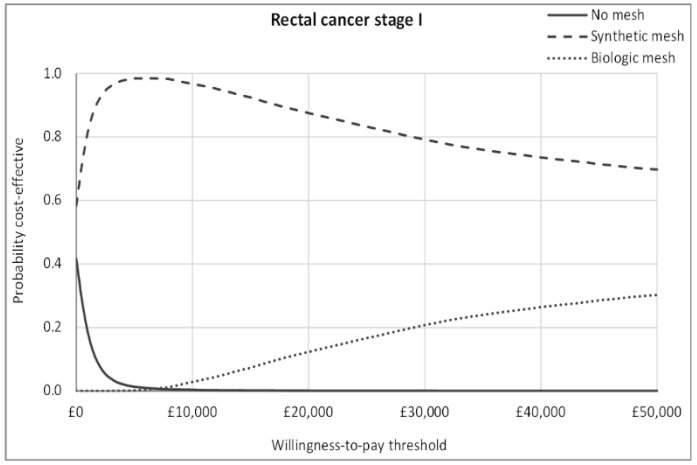


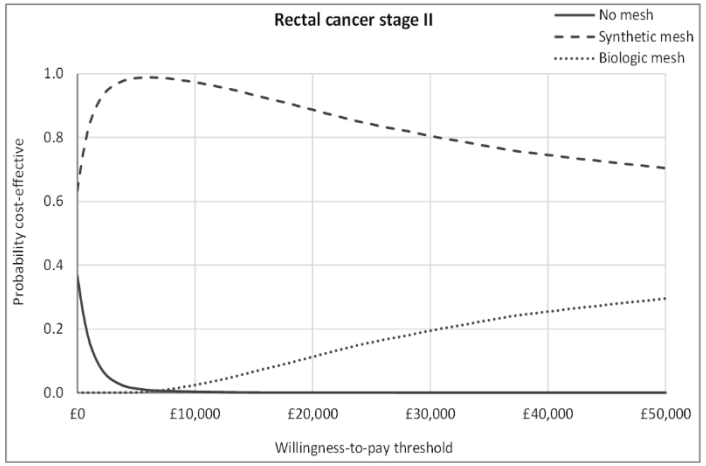
- Now 13 RCTs
- >16 meta-analyses
- No more studies needed
- What more evidence could you want?

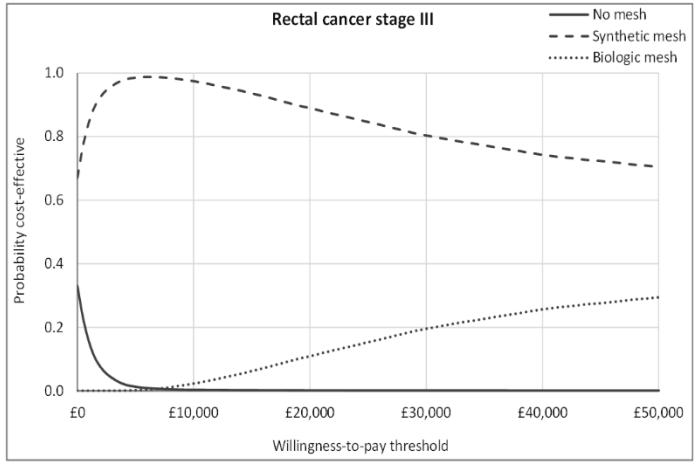
SYNTHETIC MESH PROPHYLAXIS IS COST EFFECTIVE IN RECTAL CANCER PATIENTS

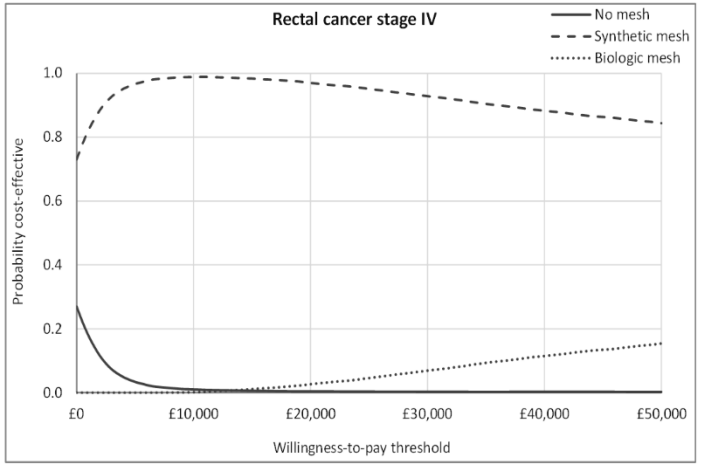
A semi-Markov model comparing the lifetime cost-effectiveness of mesh prophylaxis to prevent parastomal hernia in patients undergoing end colostomy creation for rectal cancer *Colorectal Disease*. 2021; DOI: 10.1111/codi.15848

Syed Mohiuddin[1] | Barnaby C. Reeves[2] | Neil J. Smart[3] | William Hollingworth[1] | On behalf of the CIPHER study group*









PROPHYLACTIC SYNTHETIC MESH SAVES $$

Prophylactic mesh reinforcement of stomas: a cost-effectiveness meta-analysis of randomised controlled trials

J. M. Findlay[1,2] · C. P. J. Wood[1] · C. Cunningham[1]

Techniques in Coloproctology (2018) 22:265–270

Table 3 Cost-effectiveness — Surgery alone

Mesh	NNT	Net cost per patient	
		Lowest	Highest
USD $			
Synthetic	11.1	−1513.21	−622.36
Composite	33.3	−278.80 –	+468.00
Biological	20	+792.85	+2351.40
GBP £			
Synthetic	11.1	−365.91 – –	+135.91 –
Composite	33.3	+ 106.03 – –	+306.70
Biological	20	+ 983.6 –	+2011.25

Table 3 Cost-effectiveness — Surgery and stoma nurse & appliance costs

Mesh	NNT	Net cost per patient	
		Lowest	Highest
Plus additive stoma costs			
USD $			
Synthetic	3.45	−2138.58	−1192.29
Composite	6.68	−698.68	+173.65
Biological	16.67	+624.60	+2233.45
GBP £			
Synthetic	3.45	−991.27	−552.32
Composite	6.68	−216.95	+80.27
Biological	16.67	+854.18	+1920.52

COMPLICATIONS – MESH IS SAFE

Use of prophylactic mesh during initial stoma creation to prevent parastomal herniation: a systematic review and meta-analysis of randomised controlled trials

Syed Mohiuddin[1] | William Hollingworth[1] | Niroshini Rajaretnam[2] | Barnaby C. Reeves[3] | Neil J. Smart[2]

Study	Mesh Events	Mesh Total	No Mesh Events	No Mesh Total	RR	95% CI	Weight
Brandsma 2017 [2]	2	72	3	78	0.72	[0.12; 4.20]	10.4%
Correa Marinez 2021 [35]	3	63	2	74	1.76	[0.30; 10.21]	10.4%
Fleshman 2014 [46]	4	55	1	58	4.22	[0.49; 36.58]	6.9%
Hammond 2008 [47]	0	10	0	10			0.0%
Jänes 2009 [43]	0	27	0	27			0.0%
Lambrecht 2015 [48]	2	32	1	26	1.62	[0.16; 16.94]	5.9%
López-Cano 2012 [49]	0	19	1	17	0.30	[0.01; 6.88]	3.3%
López-Cano 2016 [50]	2	24	0	28	5.82	[0.29; 115.43]	3.6%
Odensten 2019 [5]	5	114	8	118	0.65	[0.22; 1.92]	27.2%
Serra-Aracil 2009 [51]	2	27	2	27	1.00	[0.15; 6.59]	9.0%
Târcoveanu 2014 [42]	0	20	0	22			0.0%
Vierimaa 2015 [37]	4	35	6	35	0.67	[0.21; 2.16]	23.3%
Total	**24**	**498**	**24**	**520**	**0.96**	**[0.55; 1.70]**	**100.0%**

Heterogeneity: $I^2 = 0\%$, $\tau^2 = 0$, $p = 0.71$

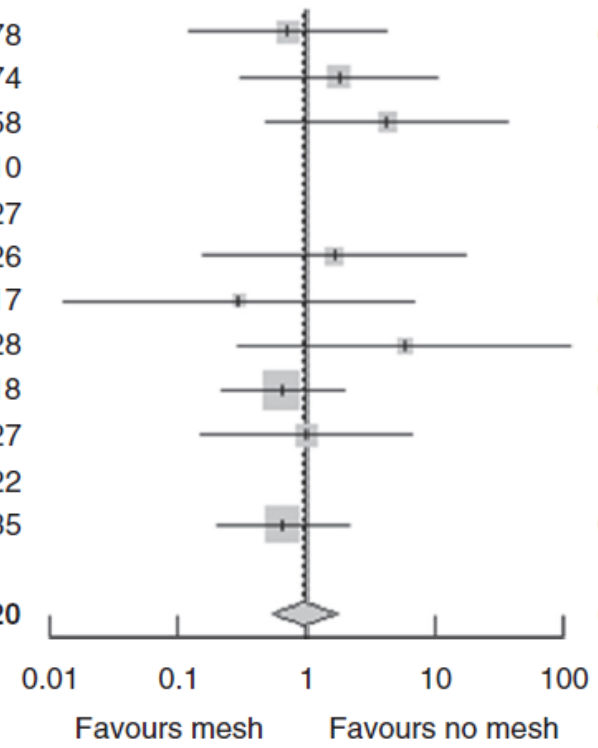


FIGURE 5 Forest plot of the risk of peristomal complications within 30 days of initial stoma creation

What can we do about parastomal hernias?

WATCHFUL WAITING

- Commonest strategy

  Risk vs benefit unknown

  Increase in size over time?

  More complex surgery if left?

  When to operate?

12 year history of parastomal hernia & watchful waiting

Kind permission from Filip Muysoms, Ghent, 2017

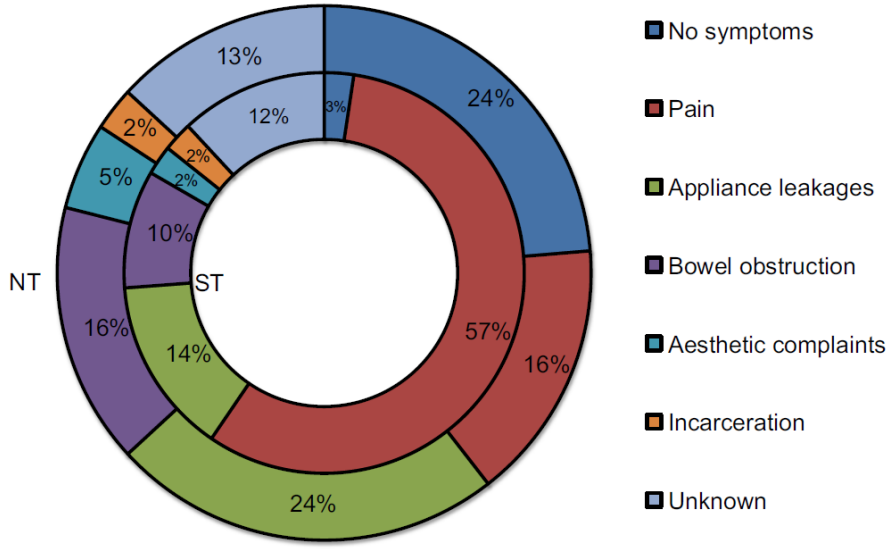
EXPERT STOMA CARE NURSING

WATCHFUL WAITING

Non-operative treatment as a strategy for patients with parastomal hernia: a multicentre, retrospective cohort study

L. F. Kroese*[1], D. P. V. Lambrichts*[1], J. Jeekel†, G. J. Kleinrensink†, A. G. Menon‡§, E. J. R. de Graaf§, W. A. Bemelman¶ and J. F. Lange*‡§

- Watchful waiting in patients:
  - Older
  - COPD
  - Cancer
  - Fewer symptoms
- Cross over = 21%



Colorectal Disease © 2017 The Association of Coloproctology of Great Britain and Ireland. **20,** 545–551

PSH REPAIR – NO WALK IN THE PARK

Trends in parastomal hernia repair in the United States: a 14-y review

JOURNAL OF SURGICAL RESEARCH • OCTOBER 2017 (218) 78–85

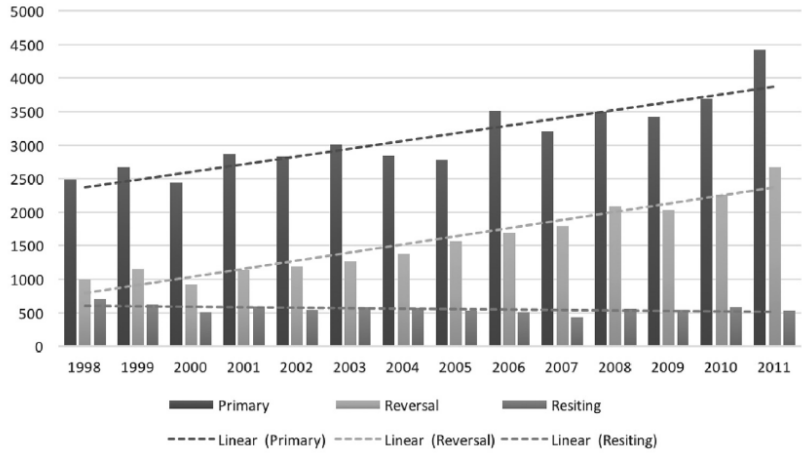


Table 4 – Outcomes.

Outcome	Overall	Primary	Reversal	Resiting	P value
Mortality (%)	2.7	3.2	1.8	2.6	<0.01
Complications (%)					
Acute respiratory failure	3.2	3.5	2.5	3.5	0.01
Cardiac complication	2.2	2.4	2.0	2	0.21
Acute MI	1.0	1.0	0.8	1.2	0.38
CNS complication	0.1	0.2	0.1	0.1	0.28
Acute cerebral accident	0.7	0.7	0.8	0.4	0.36
UTI	1.5	1.7	1.3	1.2	0.13
Acute renal failure	5.8	6.3	4.9	5.1	<0.01
Pulmonary embolism	0.7	0.7	0.5	0.8	0.21
Acute DVT	0.6	0.7	0.4	0.7	0.23
Postop shock	0.3	0.3	0.3	0.4	0.96
LOS, median days	6.3	6.1	6.5	6.7	<0.01
Median cost of care	$14,533	$14,168	$15,016	$14,959	<0.01

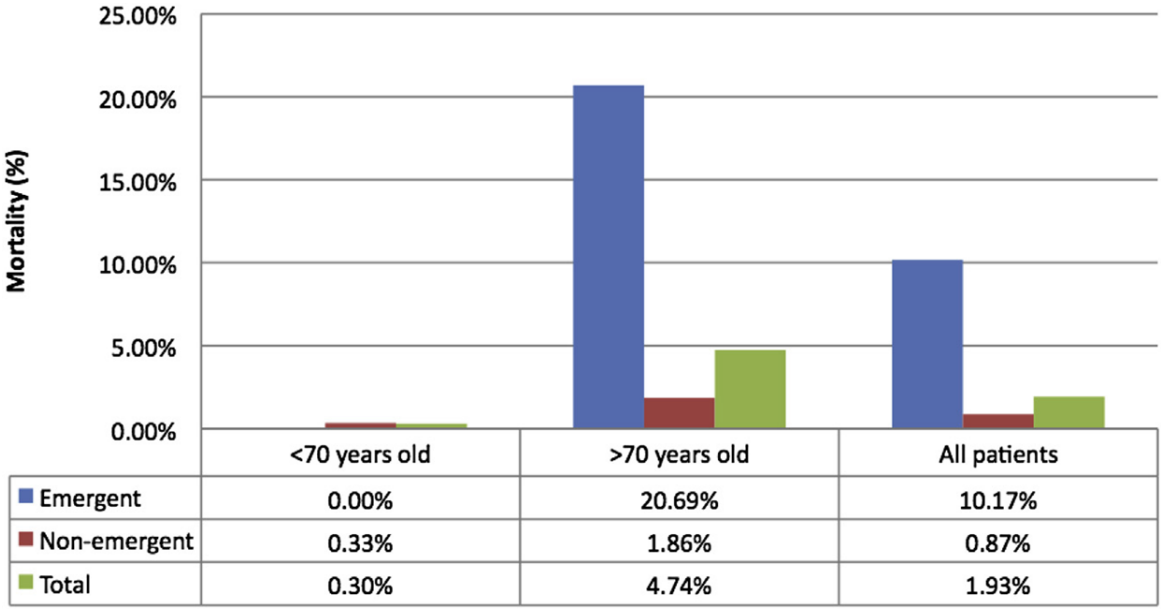
CNS = central nervous system; DVT = deep vein thrombosis; MI = myocardial infarction; UTI = urinary tract infection.

Paracolostomy Hernia Repair: Who and When?

http://dx.doi.org/10.1016/j.jamcollsurg.2014.01.054

Zachary A Gregg, MD, Haisar E Dao, MD, Steven Schechter, MD, FACS, Nishit Shah, MD

NSQUIP 519 cases 2005-2008



TALK ABOUT OUTCOME

- Recurrence is the key measure for surgeons
- But for patients….
  - Chronic pain
  - Mesh complications
    - Rigidity
    - Seroma
    - Infection
    - Erosion / Fistula
  - QoL & Function
  - Appliance fixation
- Patient expectation

BETTER AFTER SURGERY?

- Symptom threshold to intervene not defined
- Number of symptoms - are all symptoms equal?
- Does ↓ symptoms equate to improved QOL?

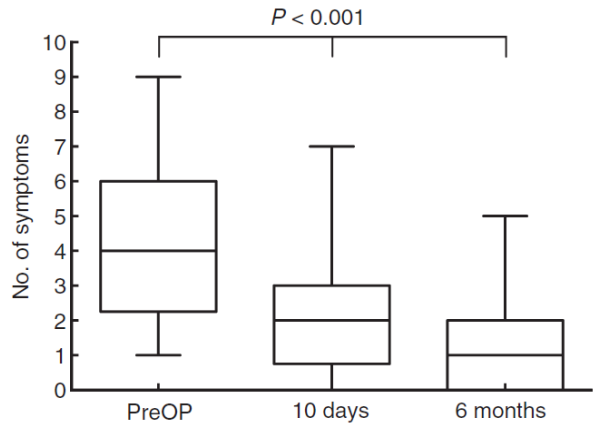


Figure 1 Median number of symptoms.

Table 3 Prevalence of symptoms preoperatively, 10 days and 6 months after repair for parastomal hernia.

	Preoperative $N = 48$ (%)	10 days $N = 38$ (%)	6 months $N = 35$ (%)
Bearing-down sensation	29/41 (71)	5/35 (14)	3/31 (10)
Pain	29/45 (64)	23/35 (66)	4/31 (13)
Difficulty finding properly fitting clothes	24/42 (57)	5/35 (14)	0/30 (0)
Difficulty with stomal appliance	25/45 (56)	4/35 (11)	4/32 (13)
Cosmetic complaints	23/42 (55)	4/35 (11)	1/32 (3)
Activity limitation	23/43 (54)	12/35 (34)	1/31 (3)
Leakage	20/43 (47)	9/37 (24)	8/32 (25)
Erratic action of the stoma	18/42 (43)	5/35 (14)	3/32 (9)
Social restriction	14/40 (35)	3/35 (9)	2/32 (6)
Skin problems	12/40 (30)	9/36 (25)	11/32 (34)

At postoperative day 10, 10 patients did not reply. At 6 months, one patient had died, three had recurrence and nine patients did not reply.

Krogsgaard et al CODI 2017

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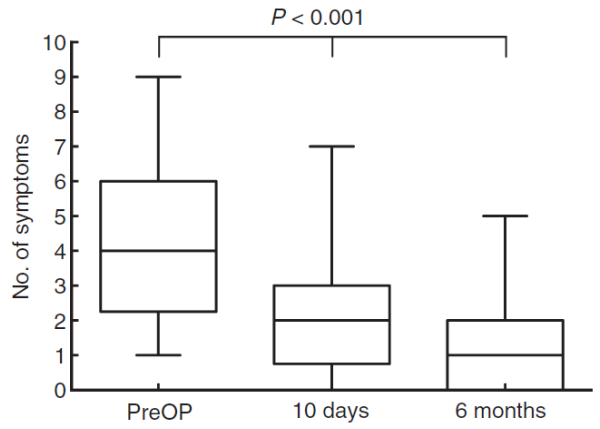

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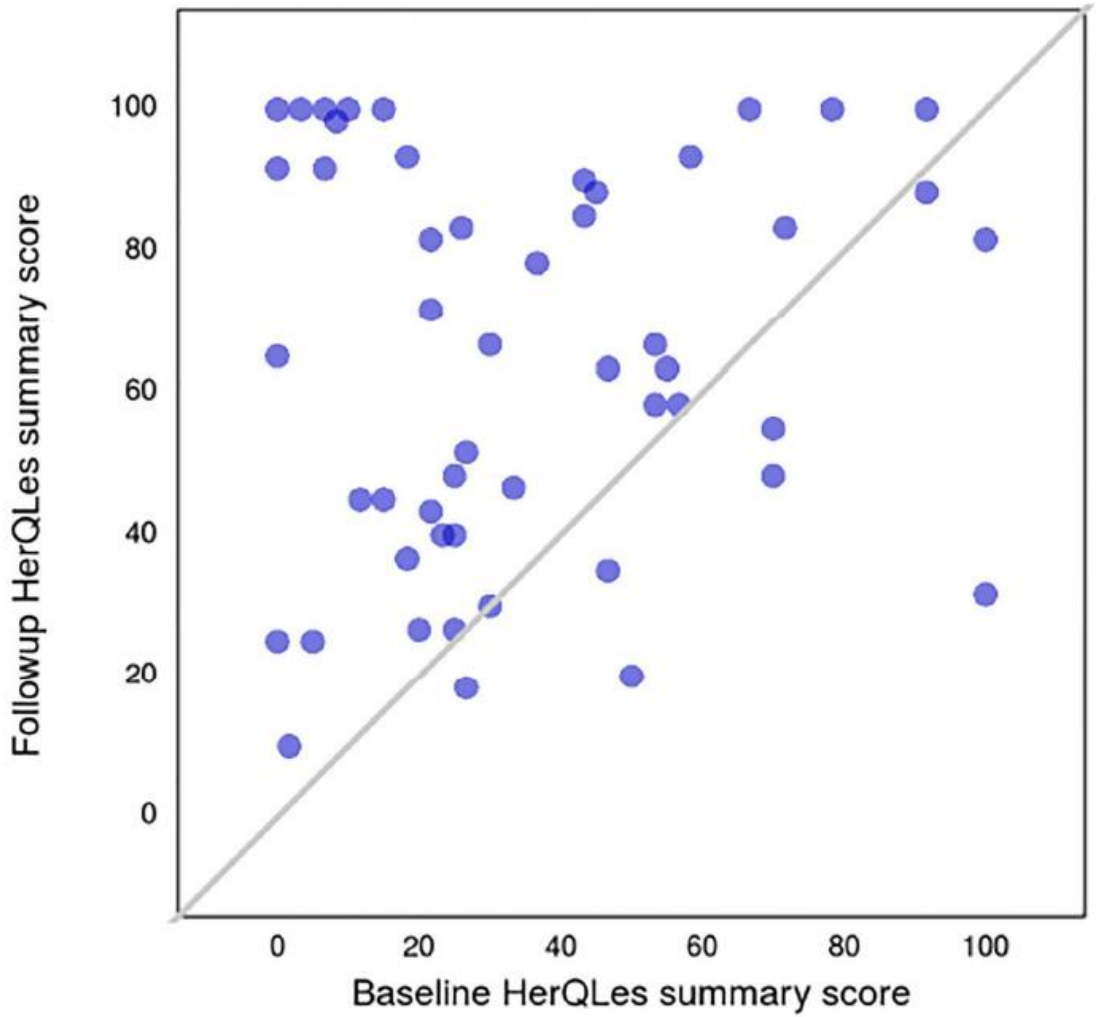
Krogsgaard et al CODI 2017

BETTER AFTER SURGERY?

- Data slowly accumulating

- AHSQC
- HerQLes
- 51 pre and post op at 6 or 12 months follow up



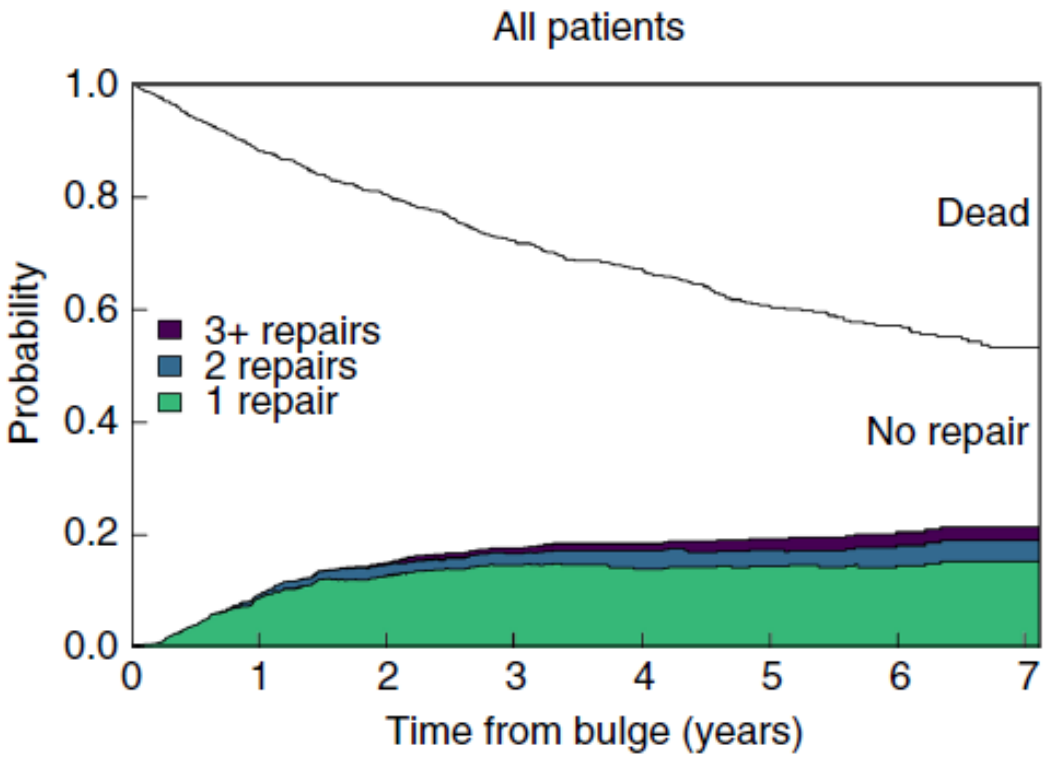
Gavigan et al JACS 2018

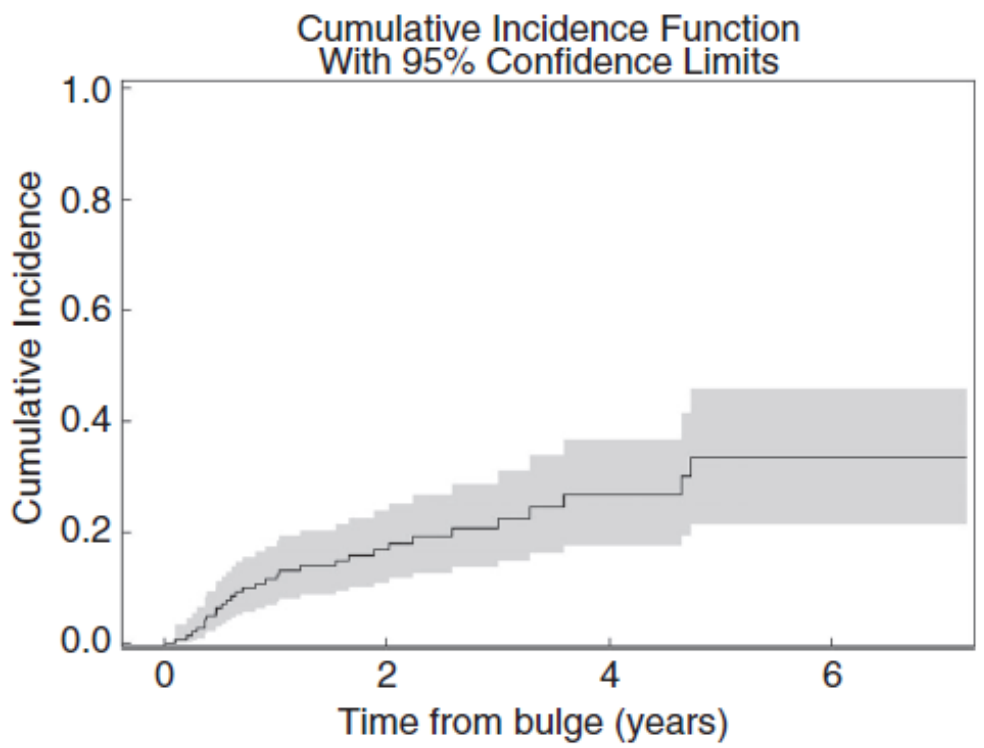
SYMPTOMS LEAD TO SURGERY

Surgical repair of parastomal bulging: a retrospective register-based study on prospectively collected data

Colorectal Disease © 2020
doi:10.1111/codi.15197

**M. Krogsgaard*'† , I. Gögenur‡, F. Helgstrand‡, R. M. Andersen*'†, A. K. Danielsen†'§ ,
A. Vinther¶'**, T. W. Klausen††, J. Hillingsø*, B. M. Christensen* and T. Thomsen§'‡‡**





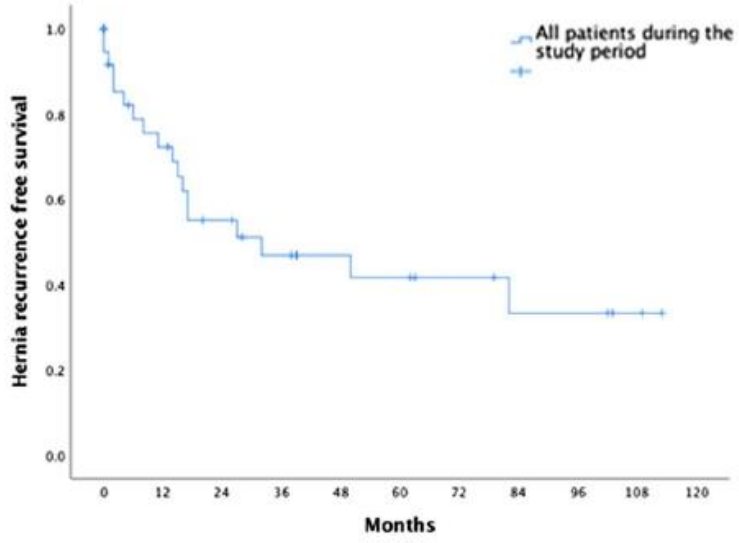
RECURRENT PSH OUTCOMES

Outcomes of surgically managed recurrent parastomal hernia: the Sisyphean challenge of the hernia world

R. L. Harries[1] · I. R. Daniels[1] · N. J. Smart[1]

Hernia
https://doi.org/10.1007/s10029-020-02161-2

a



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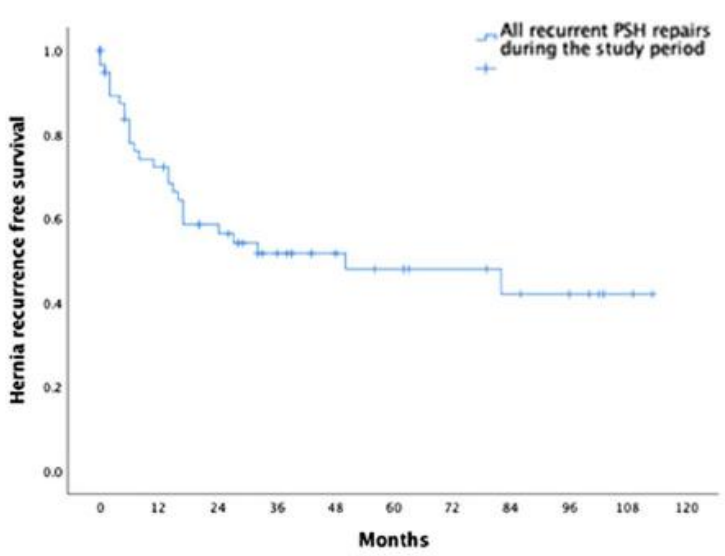

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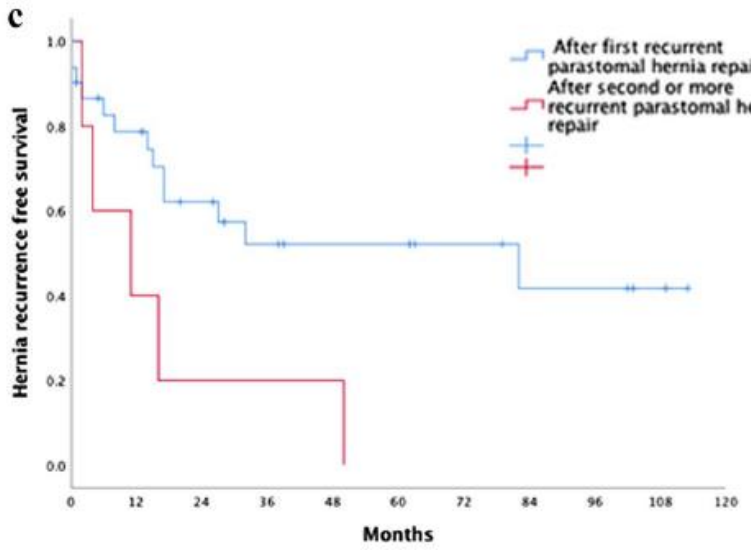
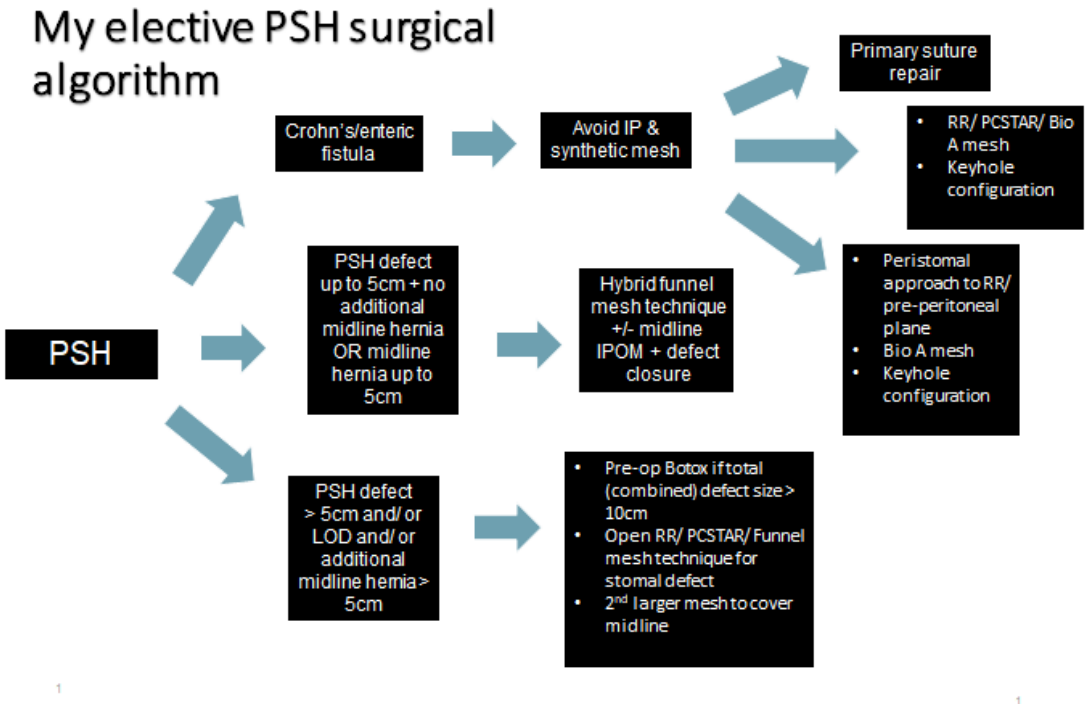
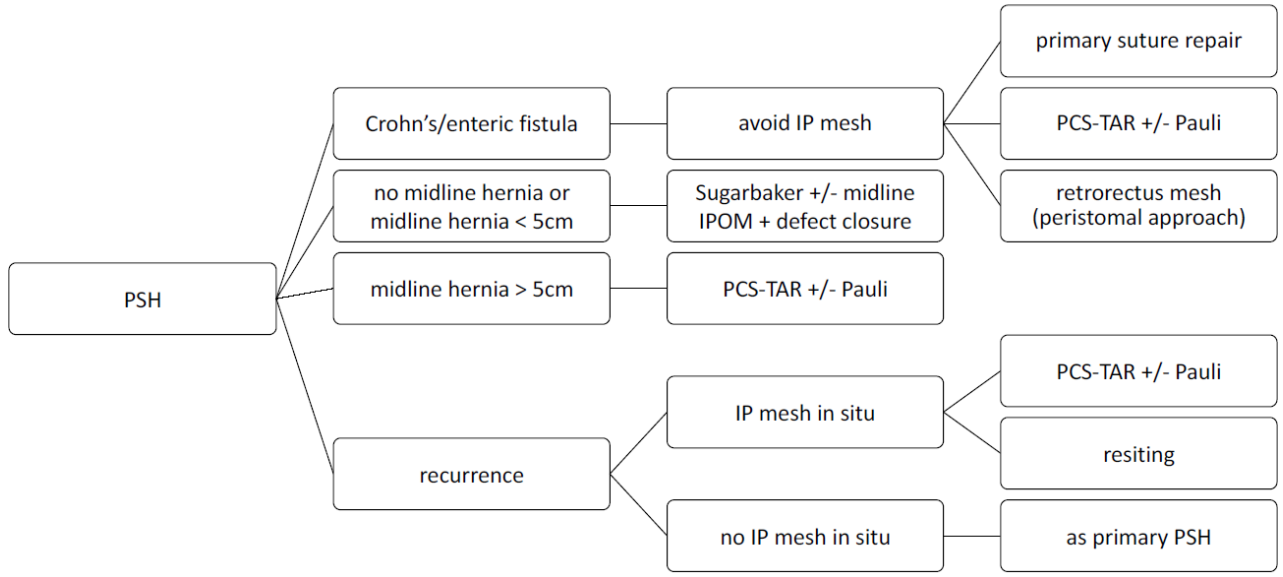


TAILORED APPROACH – DO EXPERTS AGREE?

- Toby Hammond



- Akash Mehta

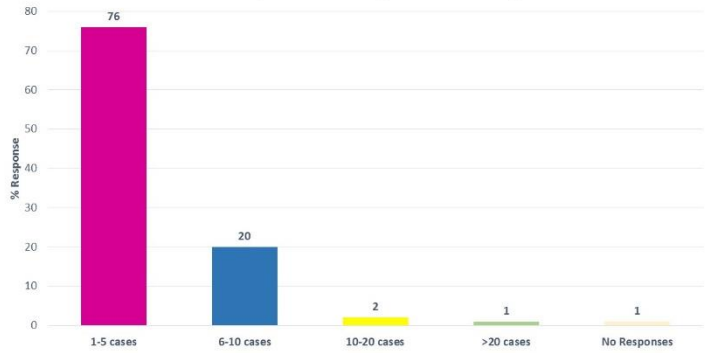


PSH REPAIR – EU PERSPECTIVE

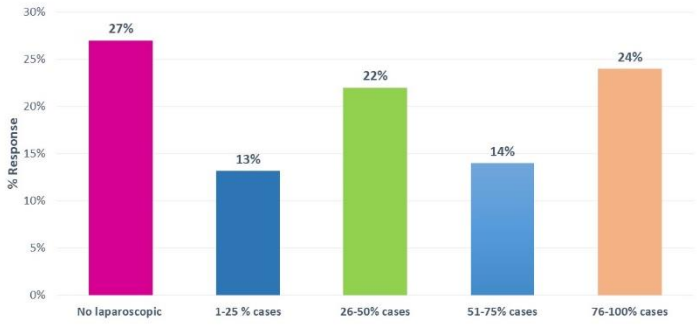
A survey on practices for parastomal hernia prevention and repair among ESCP surgeons

M. I. Aslam[1,2] · I. Rubio-Perez[3] · N. J. Smart[4] · B. Singh[1,2] · on behalf of European Society of Coloproctology Education Committee

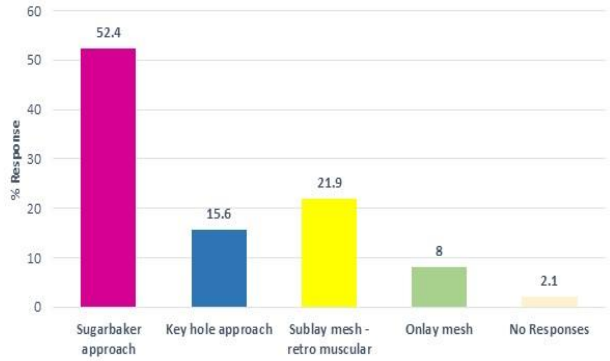
How often respondents repair PSH in a year



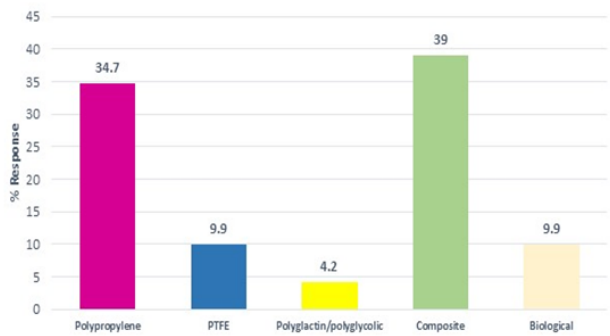
Use of laparoscopy for repair of PSH



a) Choice of operative technique for PSH repair



c) Choice of mesh for PSH repair



Hernia
https://doi.or

RELOCATION

Statement

Stoma relocation is associated with high rates of PSH development at the new stoma site and incisional hernia development at the site of previous incisions.

Recommendation

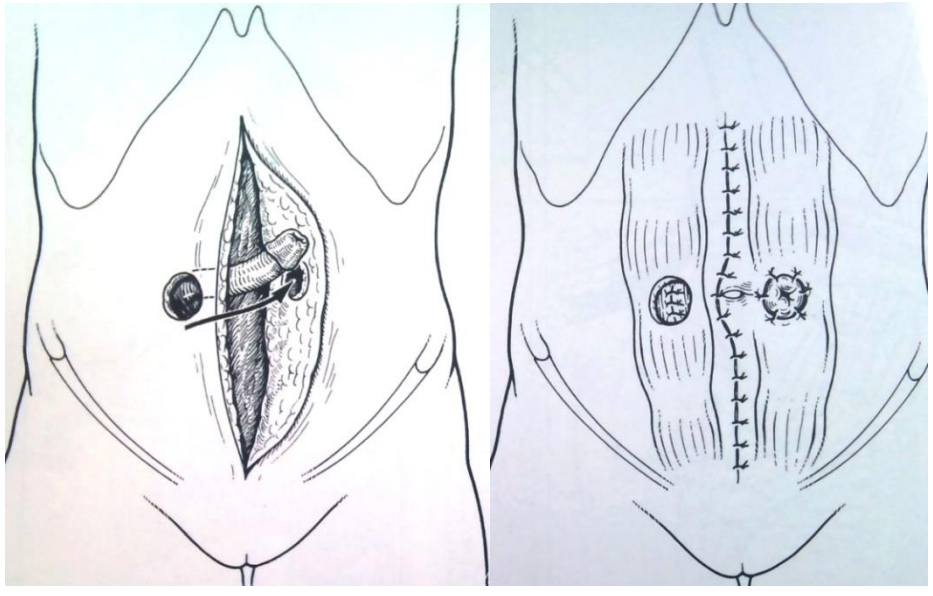
Stoma relocation as a treatment for PSH is not recommended.

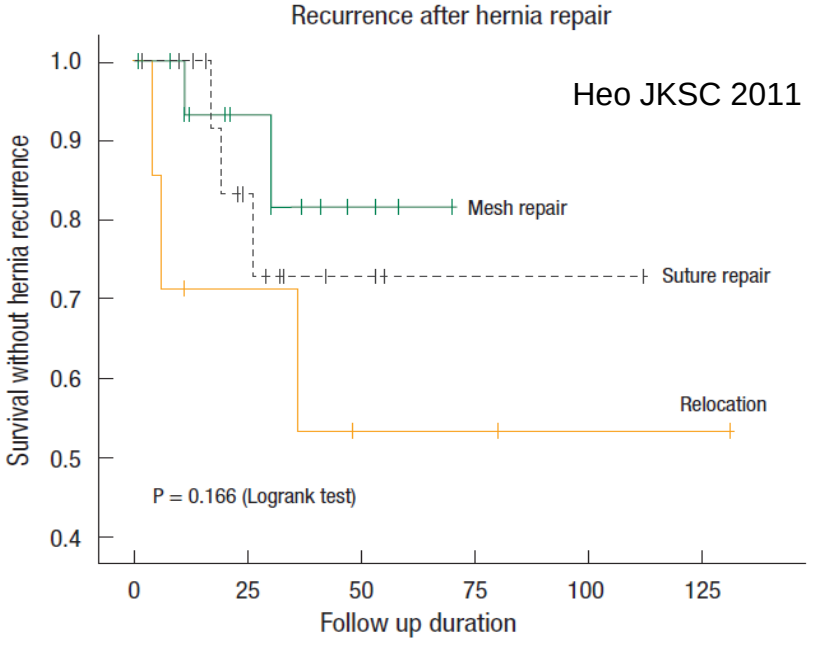
Quality of evidence

Low

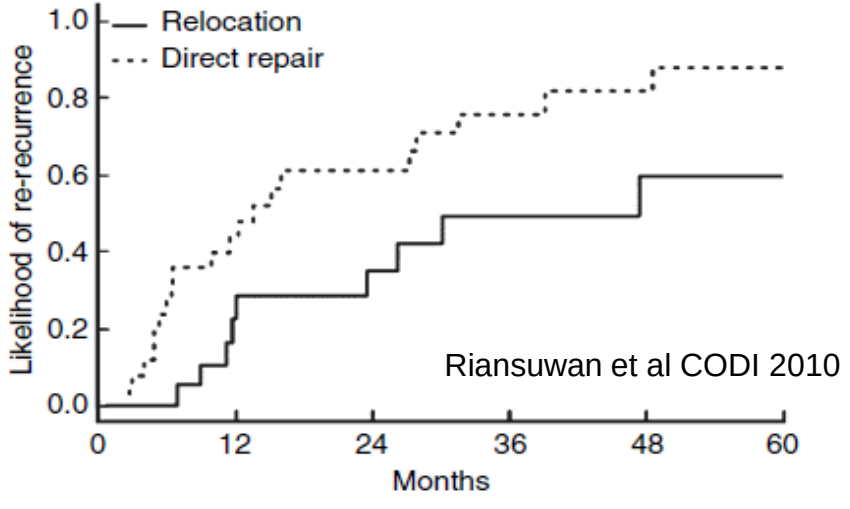
Strength of recommendation

Strong





Heo JKSC 2011



Riansuwan et al CODI 2010

THE PATIENT VOICE – SUE BLACKWELL

Surgical History

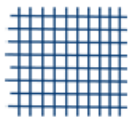
- 2005

- 2006

1. 2007 → 2008
2. 2009 → 2010
3. 2012 → 2012
4. 2012 → 2012
5. 2013 → 2016
6. 2017 → ????

Symptomatic recurrence

- 2009



Permacol
Strattice - sublay
Vycryl mesh - onlay
Bard Parastomal Hernia Patch
Covidien

SueB @littlemissileo · 21 Nov 2017
Back home and back to a new surgery date. 21st December. Maybe Santa is bringing me a #parastomalhernia repair that will work. Hmmm, chances are about as much as Santa being real!

1

SueB @littlemissileo · Mar 16
When you have your back to work interview and your boss tells you that you'll be missing five days pay this month given SSP isn't paid for the first 3 days, and you've had two lots of time off in 4 weeks. #cantaffordgin

1 2

SueB @littlemissileo · Apr 1
I'm home! The last few weeks have been spectacularly awful. All I can say is that QoL after #parastomalhernia repair can be bloody awful, far worse than with a PSH. I have learnt the hard way that the decision I made in 2007 was the wrong one. #gladtobehome

17 7 36

SueB @littlemissileo · Apr 23
Travel insurance when you have to declare 5 or more obstructions and AKI... £100+ single trip or £550+ for annual for Europe and £950+ for single trip or £1600+ for annual to include the USA...

Maybe add that to your #parastomalhernia repair consent forms!! 😢😢

1 2

SueB @littlemissileo · May 24
Nothing like getting your payslip and seeing nearly £300 deducted thanks to the recent hotel NHS stay. That's why LOS matters in any #SBO PROM. I've had enough of being an adult, it sucks!

1 1

SueB @littlemissileo · Mar 26
When the deadline for the grant application is tomorrow and you are tethered to a hospital bed (cos the catheter is at one end and the fluids all the way the other side of the bed!) with the laptop balanced on your knees trying to make the final changes. 🙃 #notquitewhatidplanned

3 1 16

SueB @littlemissileo · Feb 11
Happy Sunday to me.. back in the hotel NHS and the oncall consultant has given me an extra special 'present'!

9 4

SueB @littlemissileo · Feb 13
4 hours in A&E and 7 hours in SAU before these happened... at least the Dr in SAU asked me what I wanted to do, and laughed at the referral from A&E "she's got a complex surgical history""what's she had done?""Well she's got an ileostomy..." think the rest was too much to grasp!

14 16

PSH - THE PATIENT DILEMMA!

What are the expected outcomes? What are your outcomes for this Sx?

Will surgery improve or worsen QoL? For how long?

Is there a non-operative option?

What happens if we do nothing?

The balancing act…

Benefits/risks of mesh

How much worse would things be without mesh?

What type of mesh? What's the long term data on outcomes?

Can I live with my symptoms?

PROPHER - ESCP COHORT STUDY

International cohort study of parastomal hernia repair and patient-level outcomes

European Society of COLOPROTOLOGY

PROPHER

Patient **R**eported **O**utcomes after **P**arastomal **HE**rnia t**R**eatment

Who

- Any patient >18
- Surgeon or SCN recruitment
- Operative intervention or watchful waiting

Surgeon

- Operative technique
- 30 day outcomes

Patient

- Long term outcomes
- Quality of life
- Satisfaction
- Decisional regret

@PropherStudy

TRIPARTITE COLORECTAL MEETING 2020

European Society of COLOPROCTOLOGY

Who

Any patient with PSH having active management

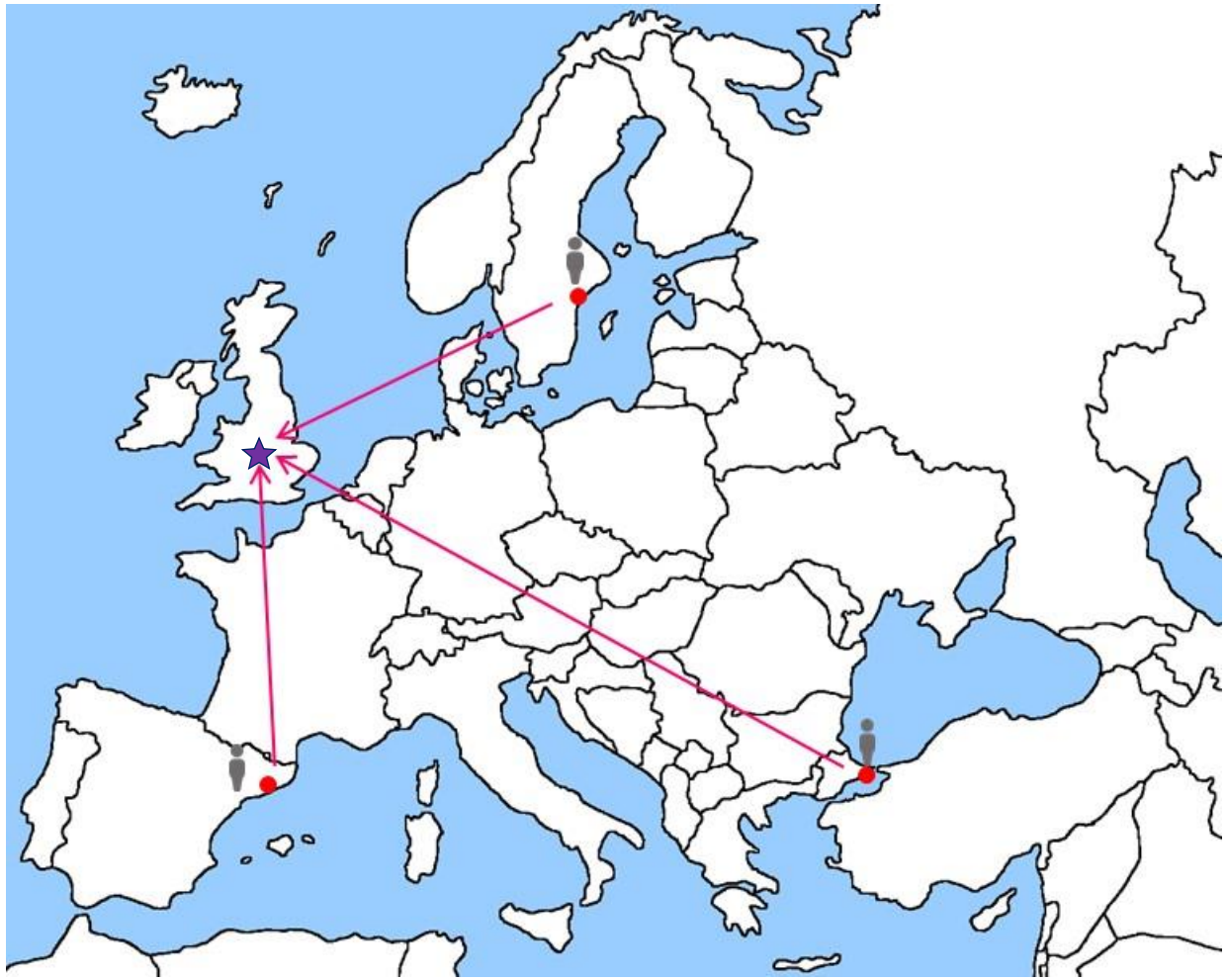
- SCN or Surgeon recruitment
- > 18 years
- Bowel stoma

Watchful waiting

or

Operative intervention

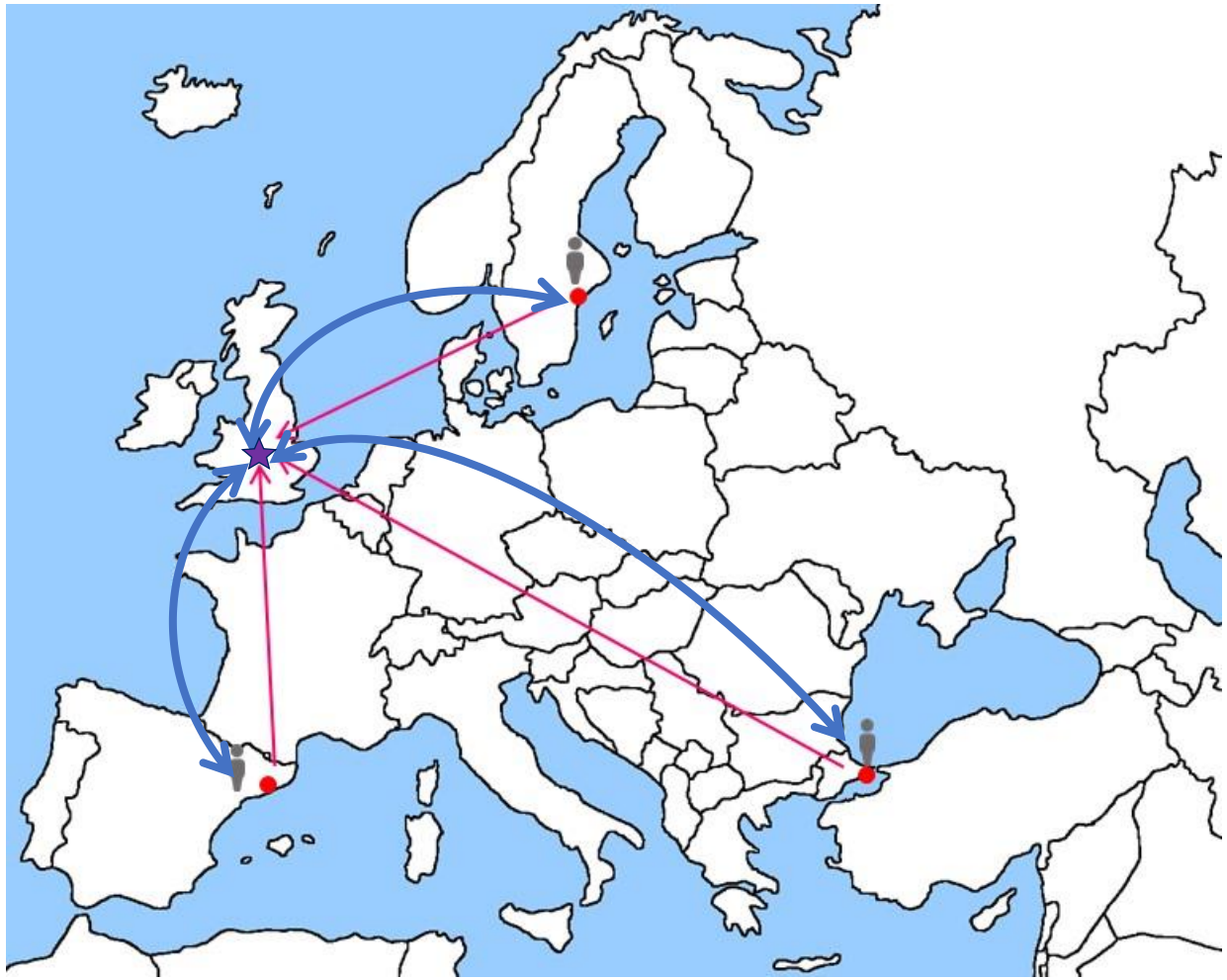
How



SURGEON: Operation technique and short-term (30 day) outcomes

REDCap
Research Electronic Data Capture

How



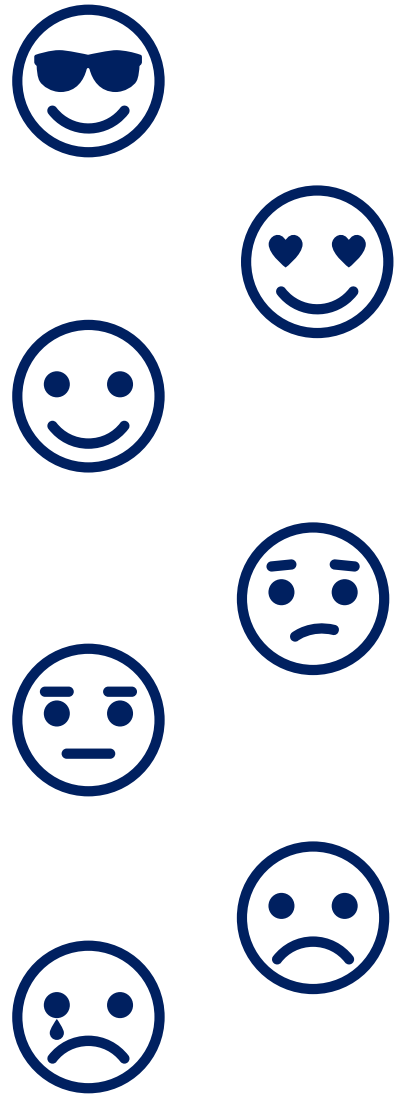
SURGEON: Operation technique and short-term (30 day) outcomes

REDCap
Research Electronic Data Capture

PATIENT: Long term outcomes, satisfaction, QOL up to 12 months

Patient reported outcomes

- HR QOL
- Stoma Impact Score
- Measure Yourself Medical Outcomes Profile (MYMOP)
- Decision Regret



*** MYMOP2 ***

Full name ..... Date of birth .....

Address and postcode.....

.....

Today' s date ..... Practitioner seen .....

Choose one or two symptoms (physical or mental) which bother you the most. Write them on the lines.
Now consider how bad each symptom is, over the last week, and score it by circling your chosen number.

SYMPTOM 1:	0	1	2	3	4	5	6
.....	As good as it could be						As bad as it could be
SYMPTOM 2:	0	1	2	3	4	5	6
.....	As good as it could be						As bad as it could be

Now choose one activity (physical, social or mental) that is important to you, and that your problem makes difficult or prevents you doing. Score how bad it has been in the last week.

ACTIVITY:	0	1	2	3	4	5	6
.....	As good as it could be						As bad as it could be

Lastly how would you rate your general feeling of wellbeing during the last week?

0	1	2	3	4	5	6
As good as it could be						As bad as it could be

How long have you had Symptom 1, either all the time or on and off? Please circle:

0 - 4 weeks 4 - 12 weeks 3 months - 1 year 1 - 5 years over 5 years

Are you taking any medication FOR THIS PROBLEM ? Please circle: YES/NO

IF YES:

1. Please write in name of medication, and how much a day/week

.....

2. Is cutting down this medication: Please circle:

Not important a bit important very important not applicable

IF NO:

Is avoiding medication for this problem:

Not important a bit important very important not applicable

Decision Regret Scale

Please think about the decision you made about _____ after talking to your [doctor, surgeon, nurse, health professional, etc.]. Please show how you feel about these statements by circling a number from 1 (strongly agree) to 5 (strongly disagree).

1.	It was the right decision	1 Strongly Agree	2 Agree	3 Neither Agree Nor Disagree	4 Disagree	5 Strongly Disagree
2.	I regret the choice that was made	1 Strongly Agree	2 Agree	3 Neither Agree Nor Disagree	4 Disagree	5 Strongly Disagree
3.	I would go for the same choice if I had to do it over again	1 Strongly Agree	2 Agree	3 Neither Agree Nor Disagree	4 Disagree	5 Strongly Disagree
4.	The choice did me a lot of harm	1 Strongly Agree	2 Agree	3 Neither Agree Nor Disagree	4 Disagree	5 Strongly Disagree
5.	The decision was a wise one	1 Strongly Agree	2 Agree	3 Neither Agree Nor Disagree	4 Disagree	5 Strongly Disagree

Steering Group

• Sue Blackwell	ACPGBI Patient Liaison Group	Liverpool
• Tom Pinkney	Professor of Colorectal Surgery	Birmingham
• Baljit Singh	Consultant Colorectal Surgeon	Leicester
• Imran Aslam	Surgical Fellow	Leicester
• Amanda Gunning	Senior Stoma Care Nurse	Exeter
• Elizabeth Li	Clinical Research Fellow	Birmingham
• Laura Magill	Senior Lecturer in Clinical Trials	Birmingham CTU
• Helle Ø Kristensen	Research Fellow	Aarhus
• Katrine J Emmertsen	Consultant Colorectal Surgeon	Randers Hospital
• Peter Christensen	Professor of Surgery	Aarhus
• Tomas Poskus	Professor of Surgery	Vilnius
• Neil Smart	Consultant Colorectal Surgeon	Exeter

Patient photos by kind permission of Filip Muysoms, Ghent & Todd Heniford, Charlotte, NC

Get in contact

https://is.gd/propher_signup

@PropherStudy

SUMMARY

- PSH are common, often symptomatic & reduce HRQOL. Consumes health care resources.
- Best method for stoma creation unknown – ongoing research – CIPHER study.
- Repair is challenging – best options being explored in PROPHER