Medical management of EC fistula

Dr Simon Gabe

Consultant Gastroenterologist

St Mark's Hospital

The Lennard-Jones Intestinal Failure Unit

AuSPEN

St MARK'S HOSPITAL

Types of intestinal failure

Type 1

- Self-limiting intestinal failure
- Acute post-op ileus

Type 2

- Significant & prolonged PN support (>28 days)
- GI surgery complicated by EC fistulation

Type 3

- Chronic IF (long term PN support)
- Short bowel syndrome
- Motility disorder

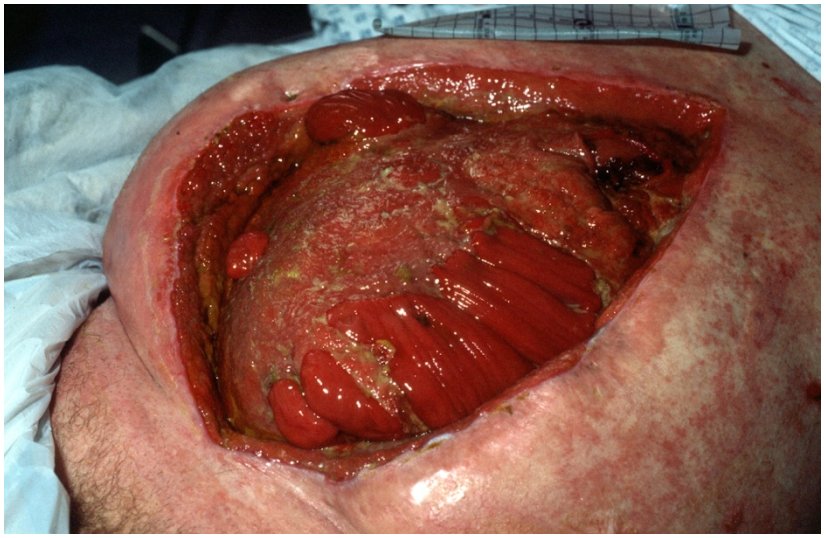
Lal et al. *AP&T 2006:*24;19-31

Enterocutaneous fistulae

Medical & surgical challenge

Significant health care costs

High mortality



45%
1940's

→

5-20%
Since 1960's

Sepsis is the main cause of death

What is a high output fistula?

- >200ml/day
- >500ml/day
- >1L/day
- >1.5L/day

Mortality & EC fistulae

Poor prognostic factors

Altomare et al, 1990	Campos et al, 1999	Maudsley et al, 2008
• ↑ APACHE score • ↓ albumin	• High output • Presence of complications	• High output • ↑ age

Fistula related mortality

Multivariate analysis for patients managed conservatively

277 patients with ECF: 10.8% fistula related mortality

Variable	Group	OR (95%CI)	P value
Age		1.7 (1.3, 2.4)	0.001
Fistula output	Low	1	0.003
	High (>500ml/day)	4.7 (1.7, 13.3)	

Maudsley et al, AP&T 2008;28:1111–1121

Acute IF management: EC fistula

Immediate	Fluid balance
	Sepsis
	Wound management
	Pain control
Early	Fluid balance (maintenance)
	Nutrition (refeeding risks)
	Psychosocial, mobility
Late	**A**natomy (site of fistula, drainage)
	Planned procedure (not days 10 – 100)

EC fistula: standard or usual care

6 weeks TPN

nil by mouth

Parenteral nutrition

EC fistulae

What do you do at your hospital?

- 6 weeks TPN (± octreotide)
- Allow to eat
- Allow to drink (± IV nutrition)
- Allow to eat and drink (± IV nutrition)
- Other

Somatostatin Receptor Subtypes

Binding affinities

	Receptor subtype				
	SSTR 1	*SSTR 2*	*SSTR 3*	*SSTR 4*	*SSTR 5*
Somatostatin-14	+ +	+ +	+ +	+ +	+ +
Octreotide	—	+ +	+	—	+ +

+ +, high affinity; +, moderate affinity; —, does not bind

All 5 receptor subtypes are expressed in the GI tract (esp SSTR 3)

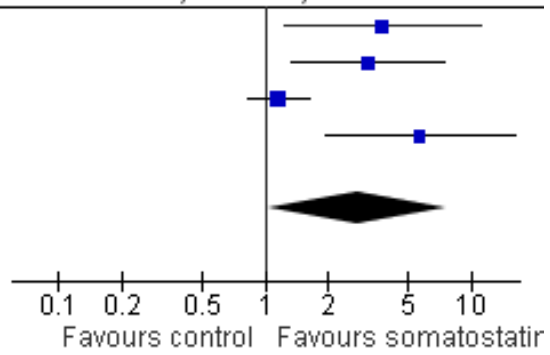
Fistula closure

Meta analysis

Study or Subgroup	Somatostatin Events	Somatostatin Total	Control Events	Control Total	Weight	Risk Ratio M-H, Random, 95% CI
Isenmann et al 1994	14	25	3	20	22.4%	3.73 [1.24, 11.21]
Leondros et al 2004	16	19	4	15	25.1%	3.16 [1.33, 7.47]
Spiliotis et al 1990	14	18	20	30	29.7%	1.17 [0.82, 1.66]
Torres et al 1992	17	20	3	20	22.9%	5.67 [1.96, 16.35]
Total (95% CI)		**82**		**85**	**100.0%**	**2.79 [1.03, 7.56]**
Total events	61		30			

Heterogeneity: Tau² = 0.84; Chi² = 19.07, df = 3 (P = 0.0003); I² = 84%

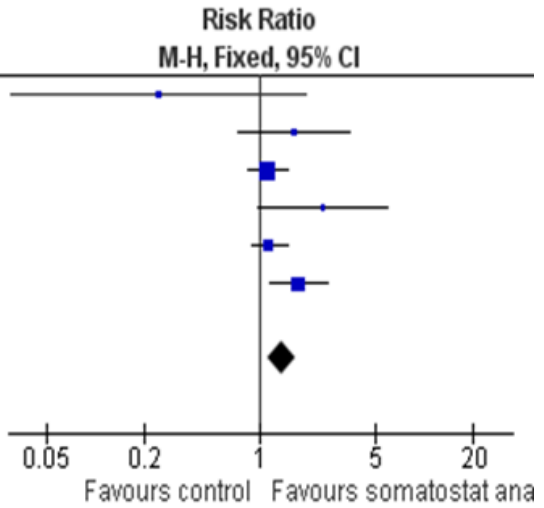
Test for overall effect: Z = 2.02 (P = 0.04)



Study or Subgroup	Somatostatin analogue Events	Somatostatin analogue Total	Control Events	Control Total	Weight	Risk Ratio M-H, Fixed, 95% CI	Year
Scott et al 1993	1	11	3	8	4.6%	0.24 [0.03, 1.92]	1993
Sancho et al 1995	8	14	6	17	7.2%	1.62 [0.74, 3.56]	1995
Hernandez et al 1996	30	40	30	45	37.6%	1.13 [0.86, 1.48]	1996
Leondros et al 2004	11	17	4	15	5.7%	2.43 [0.98, 6.03]	2004
Jamil et al 2004	15	16	14	17	18.1%	1.14 [0.88, 1.47]	2004
Gayral et al 2009	35	54	20	53	26.9%	1.72 [1.15, 2.56]	2009
Total (95% CI)		**152**		**155**	**100.0%**	**1.36 [1.12, 1.63]**	
Total events	100		77				

Heterogeneity: Chi² = 9.38, df = 5 (P = 0.09); I² = 47%

Test for overall effect: Z = 3.17 (P = 0.002)



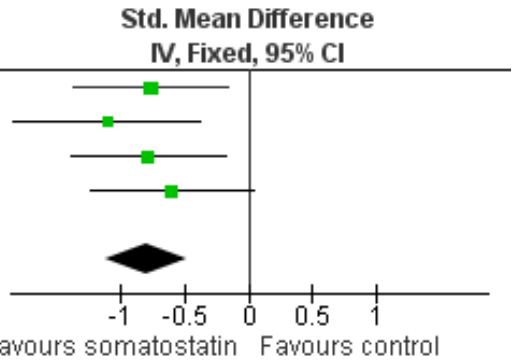
Rahbour G et al, Ann Surg 2012 256(6):946-54

Time to fistula closure

Meta analysis

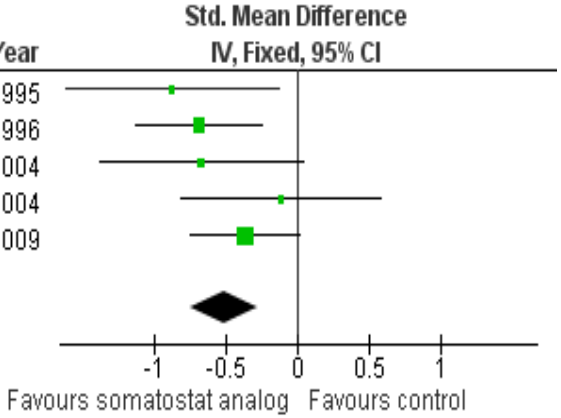
Study or Subgroup	Somatostatin Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI
Isenmann et al 1994	13	7.7	25	19	7.7	20	27.5%	-0.77 [-1.38, -0.15]
Leondros et al 2004	10.5	7.5	19	18	5.3	15	19.1%	-1.10 [-1.84, -0.37]
Spiliotis et al 1990	18.2	11.5	18	27.4	11.5	30	27.9%	-0.79 [-1.39, -0.18]
Torres et al 1992	13	9.8	20	19	9.8	20	25.5%	-0.60 [-1.24, 0.03]
Total (95% CI)			**82**			**85**	**100.0%**	**-0.79 [-1.11, -0.47]**

Heterogeneity: Chi² = 1.06, df = 3 (P = 0.79); I² = 0%
Test for overall effect: Z = 4.86 (P < 0.00001)



Study or Subgroup	Somatostatin analogue Mean	SD	Total	Control Mean	SD	Total	Weight	Std. Mean Difference IV, Fixed, 95% CI	Year
Sancho et al 1995	7	3	14	12	7	17	10.1%	-0.87 [-1.62, -0.13]	1995
Hernandez et al 1996	18	13	40	27	13	45	29.0%	-0.69 [-1.12, -0.25]	1996
Jamil et al 2004	14	5.4	16	17.7	5.4	17	11.3%	-0.67 [-1.37, 0.04]	2004
Leondros et al 2004	16.5	16.6	17	18	5.3	15	11.5%	-0.12 [-0.81, 0.58]	2004
Gayral et al 2009	17	24.5	54	26	24.5	53	38.2%	-0.36 [-0.75, 0.02]	2009
Total (95% CI)			**141**			**147**	**100.0%**	**-0.51 [-0.75, -0.28]**	

Heterogeneity: Chi² = 3.52, df = 4 (P = 0.47); I² = 0%
Test for overall effect: Z = 4.27 (P < 0.0001)



Rahbour G et al, Ann Surg 2012 256(6):946-54

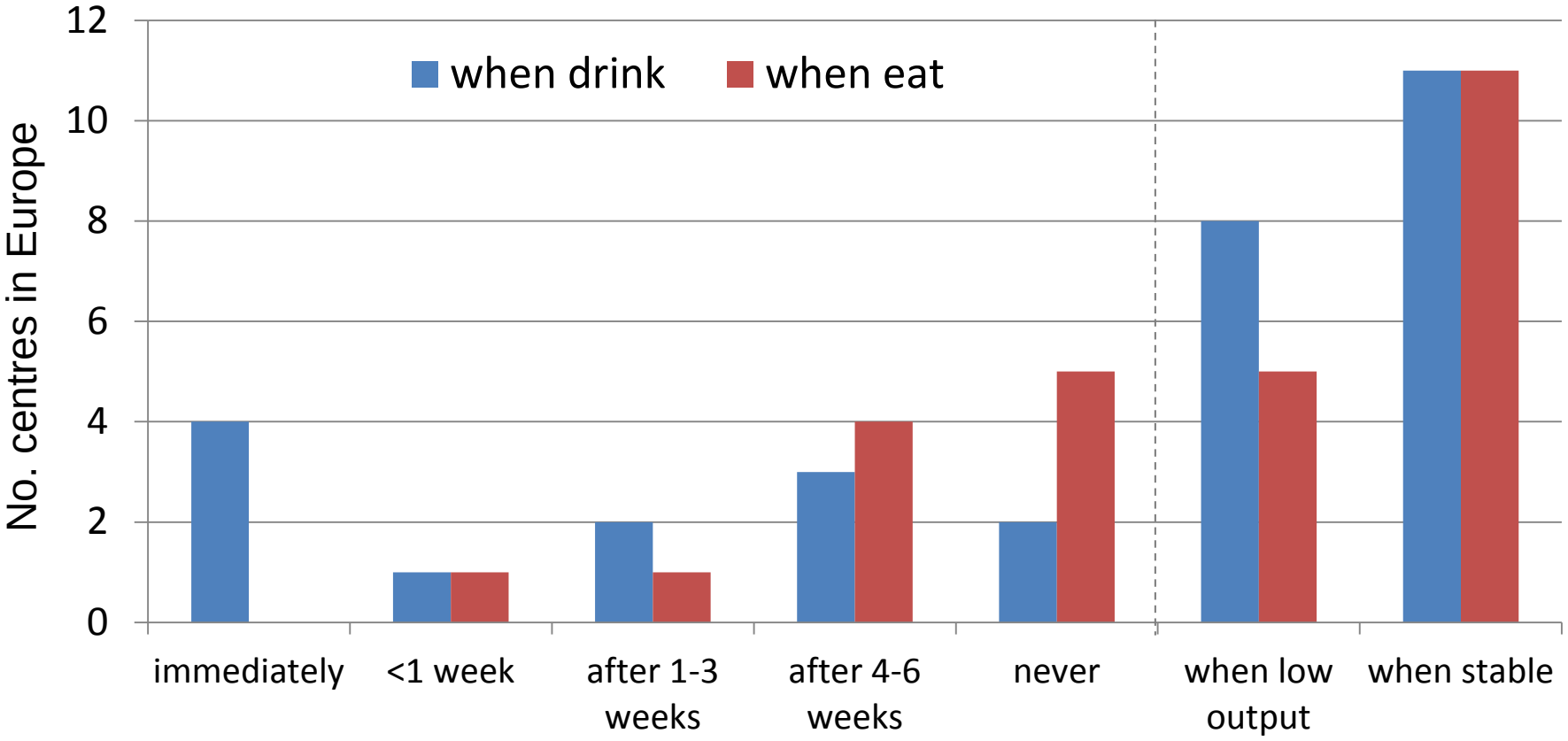
EC fistula management

European survey: 41 hospitals in 12 different countries

ECF management	%	Note
Acid suppression	100	
Opiates	82	
Octreotide	78	
Oral rehydration solution	65	
Enteroclysis (ever performed)	74	Av 3 in past year (range 1-7)
Fistuloclysis (ever performed)	54	Av 3 in past year (range 1-7)

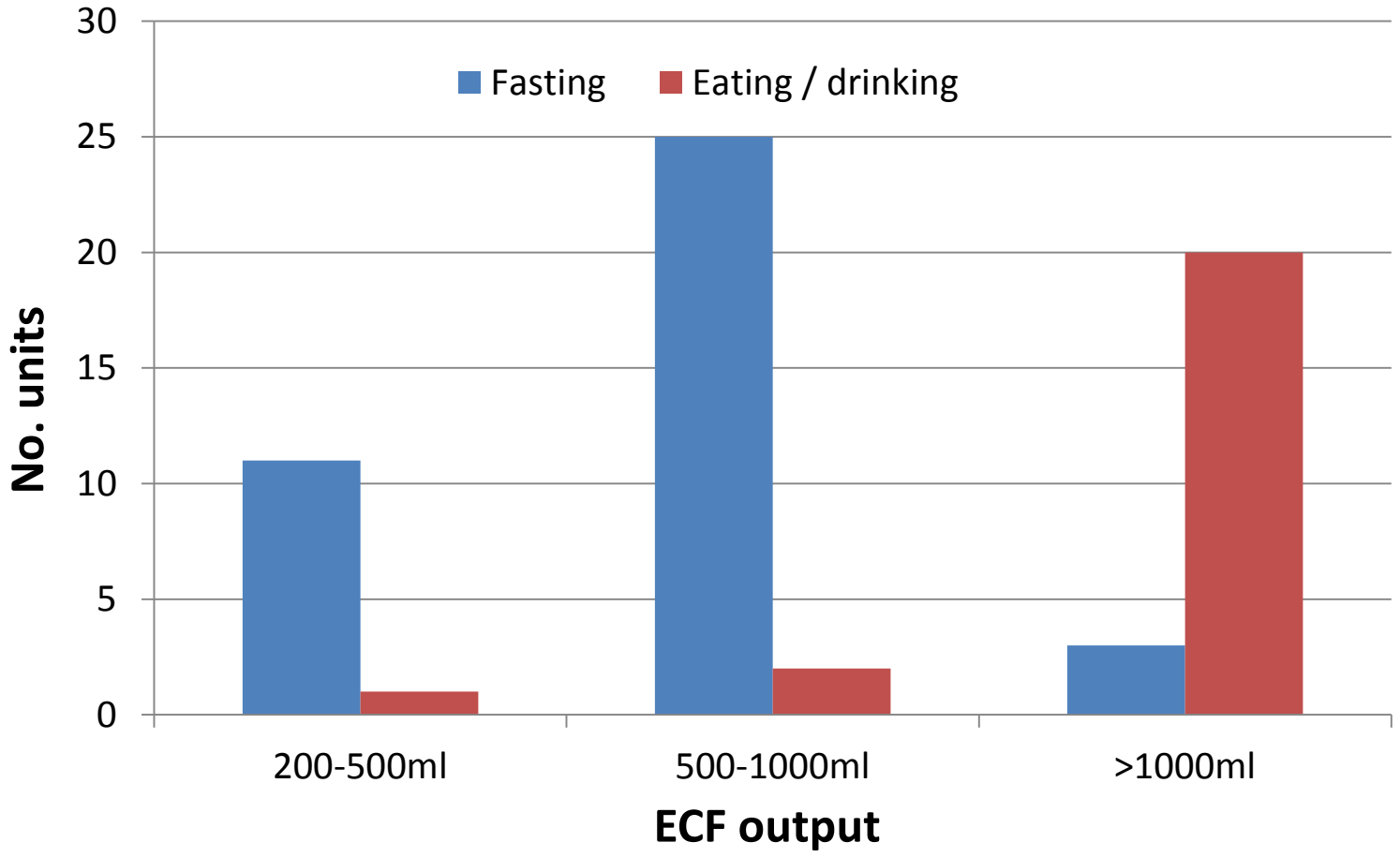
Gabe SM et al, Clinical Nutrition 2012 (abstract)

When do you allow a patient with a new ECF to eat & drink?



Gabe SM et al, Clinical Nutrition 2012 (abstract)

What is a high output ECF?



Gabe SM et al, Clinical Nutrition 2012 (abstract)

Reducing fistula output

Increasing importance

- Restrict hypo-osmolar fluids
- Use an oral rehydration solution
- Antimotility agents
  - Loperamide
  - Codeine
- Antisecretory agents
  - PPIs
  - Somatostatin-14 / octreotide?

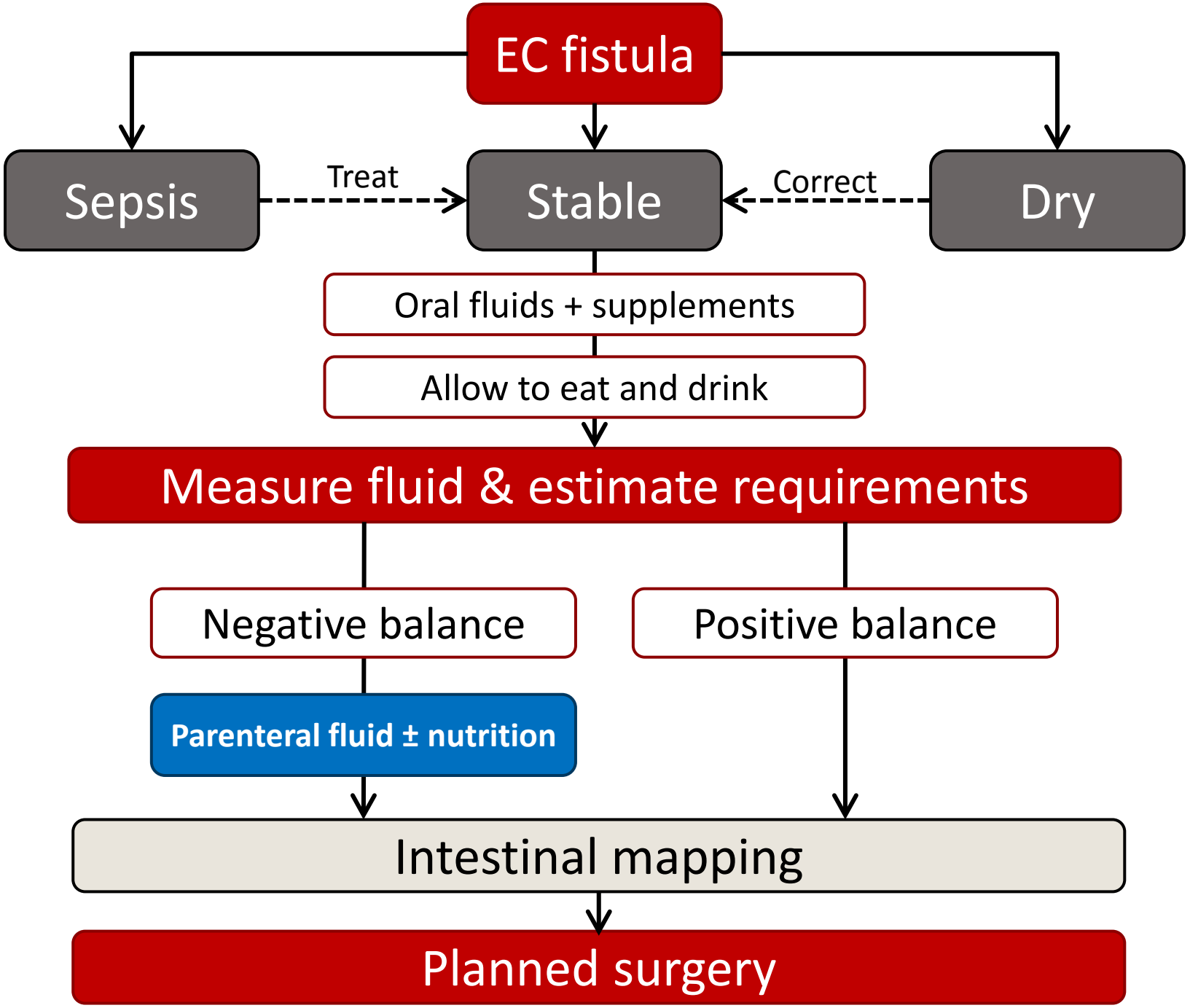
EC fistulae: when to feed

Acute (new) fistula

- If patient septic / toxic
  - Treat the sepsis
  - Drain any collections
  - Correct fluid & electrolyte imbalances
  - *Avoid parenteral nutrition in the first 48h*
- Once sepsis controlled
  - PN is reasonable

Established fistula

- 1-2 weeks?
- Can start oral fluids ± nutrition


EC fistula
Sepsis
Treat
Stable
Correct
Dry
Oral fluids + supplements
Allow to eat and drink
Measure fluid & estimate requirements
Negative balance
Positive balance
Parenteral fluid ± nutrition
Intestinal mapping
Planned surgery

EC fistula repair: timing of surgery

	Early	3-12 weeks	6-12 months	>12 months
Mortality	30-100%	7-20%	3-9%	0-3%
ECF recurrence	40-60%	17-31%	10-14%	3%

References

Conolly PT Ann Surg 2008,247,440
Conter RL AmJS1988,54,589
Datta V Dis Col R 2010,53,192
Draus Surgery 2006, 140,570
Kelly DG:Clin.Nutr 2007, Suppl 2, 42
Levy E, BJS,1989,676
Lynch AC, Ann Surg 2004,240,825
Martinez JGS 2012,16,156.
Mulier WJO, 2003,27,379
Peralta R, 2011
Pertkiewicz M,PhD dissert.1999
Vischers WJS 2008,32,445
West JP, SGO 1961,490

Summary: EC fistula management

Immediate	Fluid balance
	Sepsis
	Wound management
	Pain control
Early	Fluid balance (maintenance)
	Nutrition (refeeding risks)
	Psychosocial, mobility
Late	**Anatomy** (site of fistula, drainage)
	Planned procedure (not days 10 – 100)