

Spitalul Clinic de Urgenta
Bucuresti

Clinica de Chirurgie
Prof. Dr. M. Beuran

IS MECHANICAL BOWEL PREPARATION MANDATORY FOR ELECTIVE COLORECTAL SURGERY ?

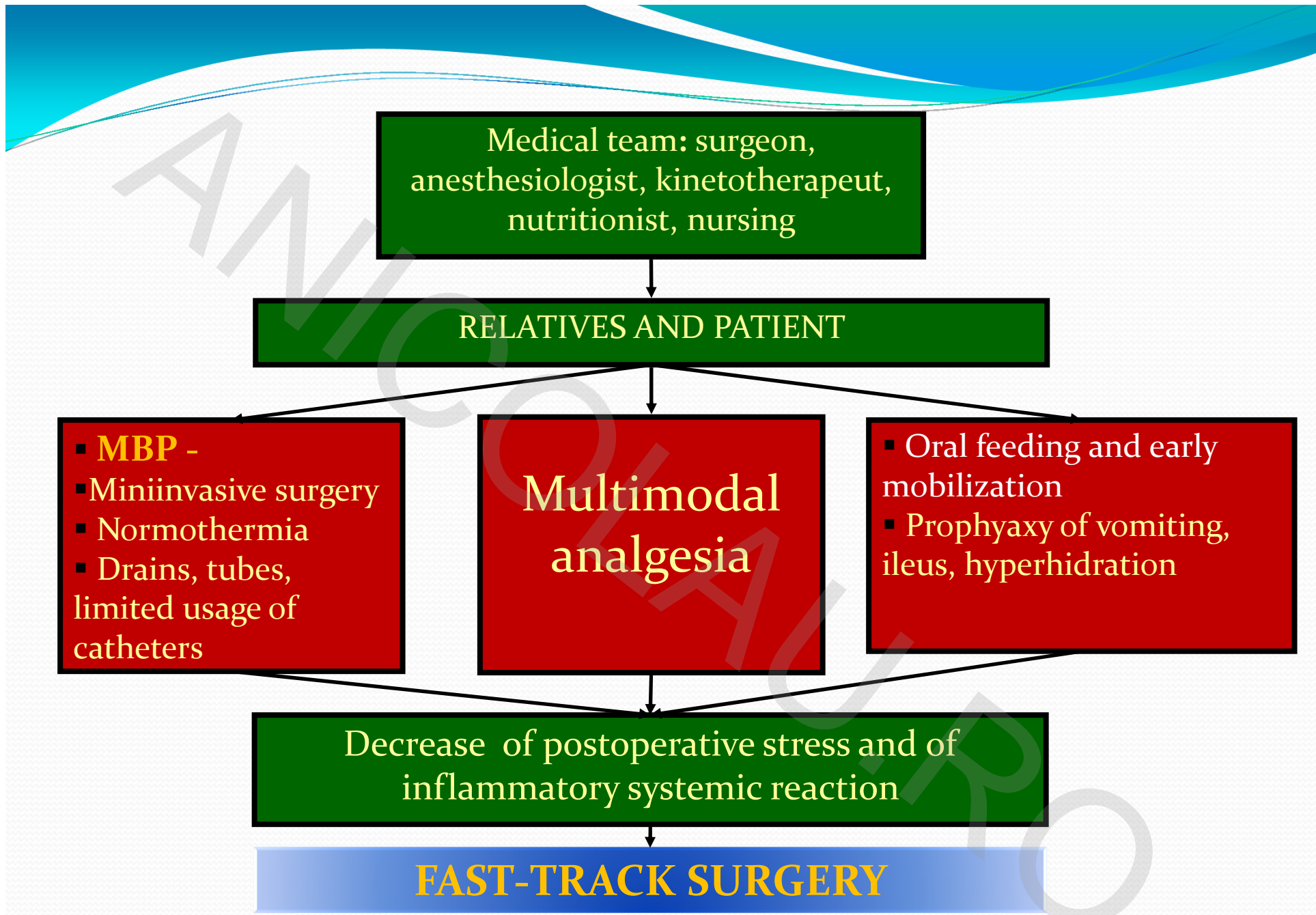
A.E. NICOLAU, G. DINESCU

The progress of the last 2 decades

- ❖ Laparoscopic revolution
 - ❖ Telemedicine
 - ❖ Robotic Surgery
 - ❖ Virtual reality
 - ❖ NOTES
- ❖ Progresses in per-operative care

Peroperative measures

- ❖ Nutrition : enteral/parenteral
- ❖ Prophylactic antibiotherapy
- ❖ Per-operative wound dressing
- ❖ Use of tubes and catheters
- ❖ Pre-operative bowel preparation



Mechanical bowel preparation (MBP) in elective colorectal surgery (ECS)= oral preparation given prior to surgery to clear faecal material from the bowel lumen

[McCoubrey AS, 2008]

❖ Surgical dogma that has dominated surgery more than 3 decades

❑ **Nichols RL, Condon R**, Surg Gynecol Obstet, 1970

❑ **Irvin TT, Goligher**, Br J Surg, 1973

WHY MBP?

- Prevents post-operative infectious complications:
 - Wound infection
 - Intra-abdominal abscesses
 - General sepsis
 - **Anastomotic leakage (AL)**
- Facilitates the intraoperative mobilizations, palpation and endoscopic exploration of the colon

[Nichols R, 1970; Vexner SD, 1993]

Advantages

1. ↓ bacterial contamination of the colon → **decreases the septic spillage during surgery**
2. fixation of the faecaloid bolus at the level of the anastomosis → tension → ischemia → **increased incidence of AL**
3. exploring the colon: palpation of small tumors, intraoperative colonoscopy (laparoscopy!)

[Wexner SD et al, 1993]

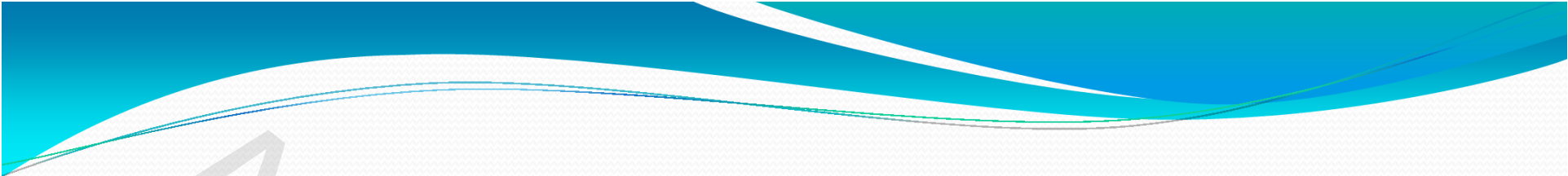
- The colon is the reservoir of germs
- MBP ↓ the number of total aerobic germs
 - for **the anaerobic germs it is necessary the preoperative antibiotic prophylaxis**
- Ideal MBC doesn't exist (the best preparation without secondary effects)

[Roig JV et al, Chir Esp, 2008]

Emergency surgery

- Occlusive tumors, benign lesions
- The colo-colic or ileo-colic anastomosis is feasible in emergency ±proximal ileo or colostomy , for protection: doesn't reduce the incidence of AL, **but decreases their associated morbidity**
- **Intraoperative wash-out**
- **Transtumoral stent**

[Biondos S et al, 2005; Tejevo et al, 1997]

- 
- MEALY K. ,1988 : colectomy in emergency with primary anastomosis, mortality 5,2%
 - MURRAY JJ. et al, 1991 : 21/25 p with colectomy in emergency and primary anastomoses, without AL, without mortality
 - NARAYNSINGH B. et al, 1998 : 58 colectomies in emergency, without AL, without mortality
 - BIONDO S. et al, 2005 : 208 left colectomies in emergency, 5,7% AL; 6,2% mortality

The disadvantages of PMC

IRVING AD & SCRIMGEOUR (Br J Surg,1987)

➤ **Changes the dogma = 72 elective CRS without MBP**

- 1) **Unpleasant for patients**
- 2) **Nausea, vomiting**
- 3) **Severe dehydration**
!!! Cardiac patients, patients with renal insufficiency
- 4) **↑ Circulatory volume**
- 5) **Electrolytic disturbances: ↓ K⁺, ↑ BUN, ↓ Ca⁺, P⁺**

Experimental

- The specific intestinal flora contributes to the healing of anastomoses

[Okada M, 1993, Rolandelli RH, 1997]

- Preoperative lavage increases the bacterial translocation

[Horgan AF, 1994]

- ↓ Weight ; ↑ Hgb; ↑ circulatory volume loss

[Holte K, 2004]

- The intestinal content filtrates through the anastomoses threads

[Fa Si-Oen, 2005]

Experimental

- Buckmire M (1998): PMC → changes of factor I and of the collagen, **with alteration of anastomotic healing**
- Coskun A (2001): polietilenglicol and fosphat disodic cause **lesions of the mucosa**, especially the last one
- Rejchrl S (2004): **edematous inflammation of the mucosa**, edema in lamina propria, hyperemia of the mucosa
- Bucher P et al (2005) : MBP **decreases the superficial mucus, increases the loss of epithelial cells** and induces an **inflammatory syndrome**

Factors that favors anastomotic leakage

(the multivariate analysis on
864 patients with 813 anastomoses)

- 1) **Albumin < 3g**
- 2) **Chronic pulmonary disease**
- 3) **Corticotherapy**
- 4) **Peritonitis**
- 5) **Occlusion**
- 6) **More than 2 UI of blood transfusion**

[Golub R et al, 1998]

ZMORA et al [Am Surg, 2003]

- ❖ 1295 questionnaires
- 99% of the surgeons use MBP
- **98% AB i.v. prophylaxis**
- 75% AB oral prophylaxis

Metaanalysis MBP +/ MBP -

Autor	Plattell et al		Slim et al		Wille-Jorgensen et al	
Year	1998		2004		2005	
No. patients	452		1454		1592	
Intraabdominal infections MBP+/MBP-	NS	NS	8,1%	2,8%	5,7%	2,5%
AL	8,1%	4%	5,6%	3,2%	6,2%	3,2%
Mortality	NS		1,4%	0,8%	1%	0,6%

* p<0,01

Contant CME et al [The Lancet, 2007]

	No.	ASA I-II	Ileo-colic A.	Colo-colic A.	Colo Rectal A.	Mec/manual	
MBP+	670	86%	28%	31%	34%	30%	66%
MBP-	684	87%	35%	31%	30%	30%	68%

	Compl.	AL	Wound infection	Abcesses	Mortality	Hospital stay
MBP+	69%	4,8%	13,4%	2,2%*	3%	10 zile (8-14)
MBP-	66%	5,4%	14%	4,7%	3,8%	10 zile (8-13)

* p=0,02; 95% CI: 2,4 (0,5-4,4)

➔ **MBP can be safely abandoned**

Metaanalysis with 15 trials and 5000p

[GRAVANTE G et al, Int J Colorectal Dis 2008)

Author	Year	MBP-	MBP+
Brownson et al (1)	1992	89	90
Santos Jr et al (2)	1994	74	75
Burke et al (3)	1994	82	87
Miettinen et al (4)	2000	129	138
Zmora et al (5)	2003	193	187
Bucher et al (6)	2005	75	78
Ram et al (7)	2005	185	164
Fa-Si-Oen et al (8)	2005	125	125
Zmora et al (9)	2006	129	120
Jung et al (10)	2007	657	686
Pena-Soria et al (11)	2007	48	49

Complications	MBP+	MBP-	Odds ratio	p
Wound infection	9,6%	8,7%	0,87 ⁰ (0,72-1,06)	NS
AL (1-12)	4,1%	3,4%	0,82 (0,61-1,1)	NS
Abcesses (1-12)	1,8%	2,5%	1,38 (0,92-2,09)	NS
Sepsis (5-7,10)	1%	0,8%	0,84(0,35-2,03)	NS
Ileus (5,7-10)	2,5%	2,2%	0,84 (0,48-1,47)	NS
Cardiac events (4-7,10)	4%	2,5%	0,63 (0,40-0,99)	0,04
Mortality (3-7,10-12)	1,7%	1,9%	1,07(0,67-1,69)	NS

ANTIBIOTIC PROPHYLAXIS

- Preoperative i.v. AB - prophylaxis (+ 1 dose if the operation is longer the 3 hours)
 - **Ceftriaxone + Metronidazole : 3 trials**
 - Neomycin + Erythromycin : 2 trials
 - Cephalothin + Metronidazole : 1 trial
 - Gentamicin + Metronidazole : 1 trial
 - Doxycycline + Metronidazole : 1 trial

[Gravante G et al, 2008]

ANTIBIOTIC PROPHYLAXIS

- Randomized multicenter study:
 - Single-dose group (just before skin incision)
 - ❖ Incisional site infection : **14,2%** (27/190)
 - 3-dose group (2 additional doses at 8h)
 - ❖ Incisional site infection : **4,3%** (8/187)

[Fujita S et al, 2007]

- **BUCHER et al, 2005**

- ❖ Overall extraabdominal morbidity rate:

- 24% : MBP+

- 11% : MBP -

Conclusions

- **Evidence-base data suggests that the dogma of the necessity of MBP before elective colorectal surgery should be reconsidered**
- After some studies, MBP before CRS is not only useless, but potentially harmful : the local inflammation associated with poor tissue perfusion and general electrolytic changes
- In the ileo-colic anastomoses and colo-colic anastomoses, MBP is not recommended

Conclusions

- **Prophylactic I.V. AB-therapy**
- Further studies are required to assess the use of rectal preparation alone prior to rectal surgery and also to include patients who have undergone pre-operative radiotherapy
- **Rigorous operative technique is mandatory**