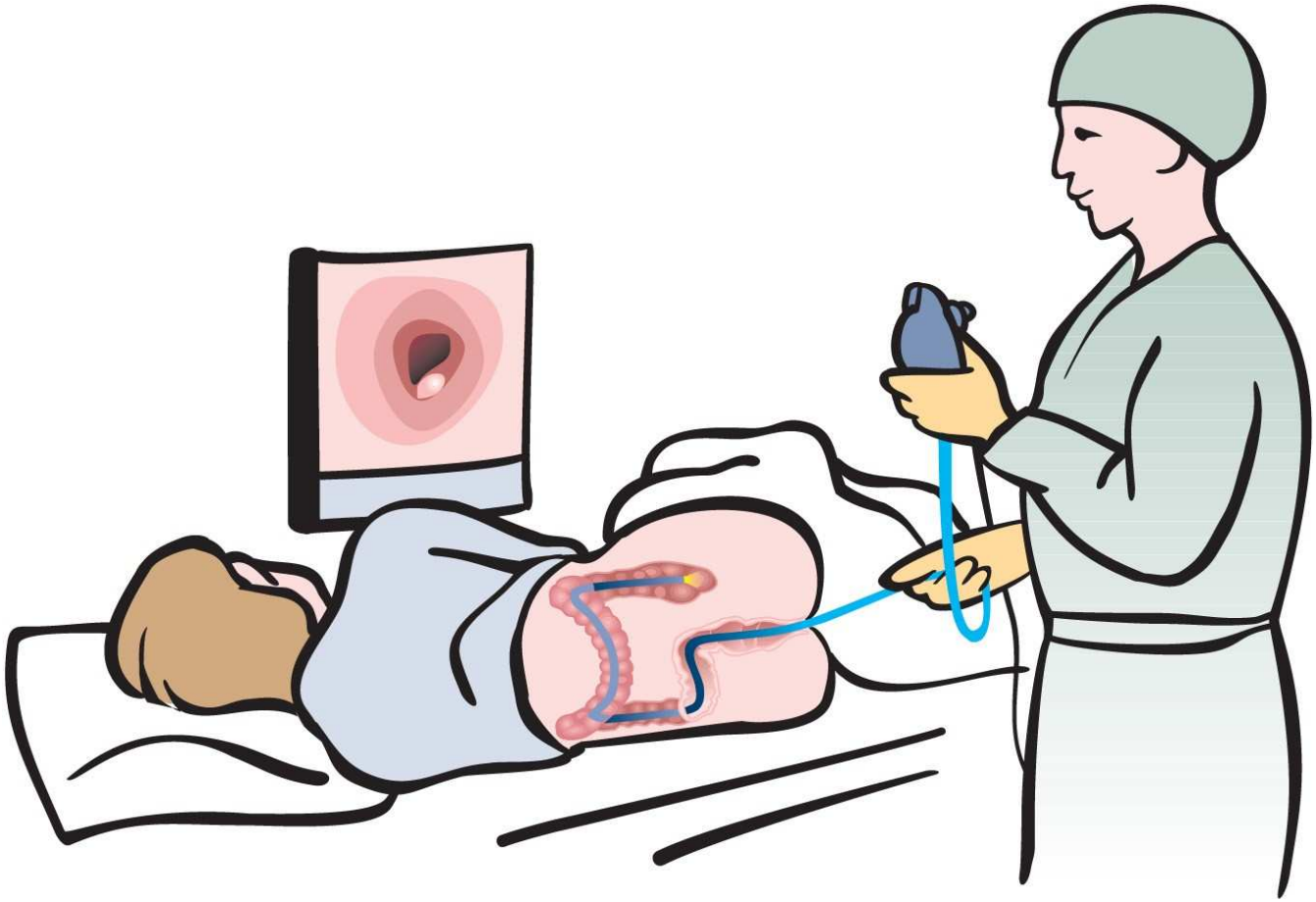
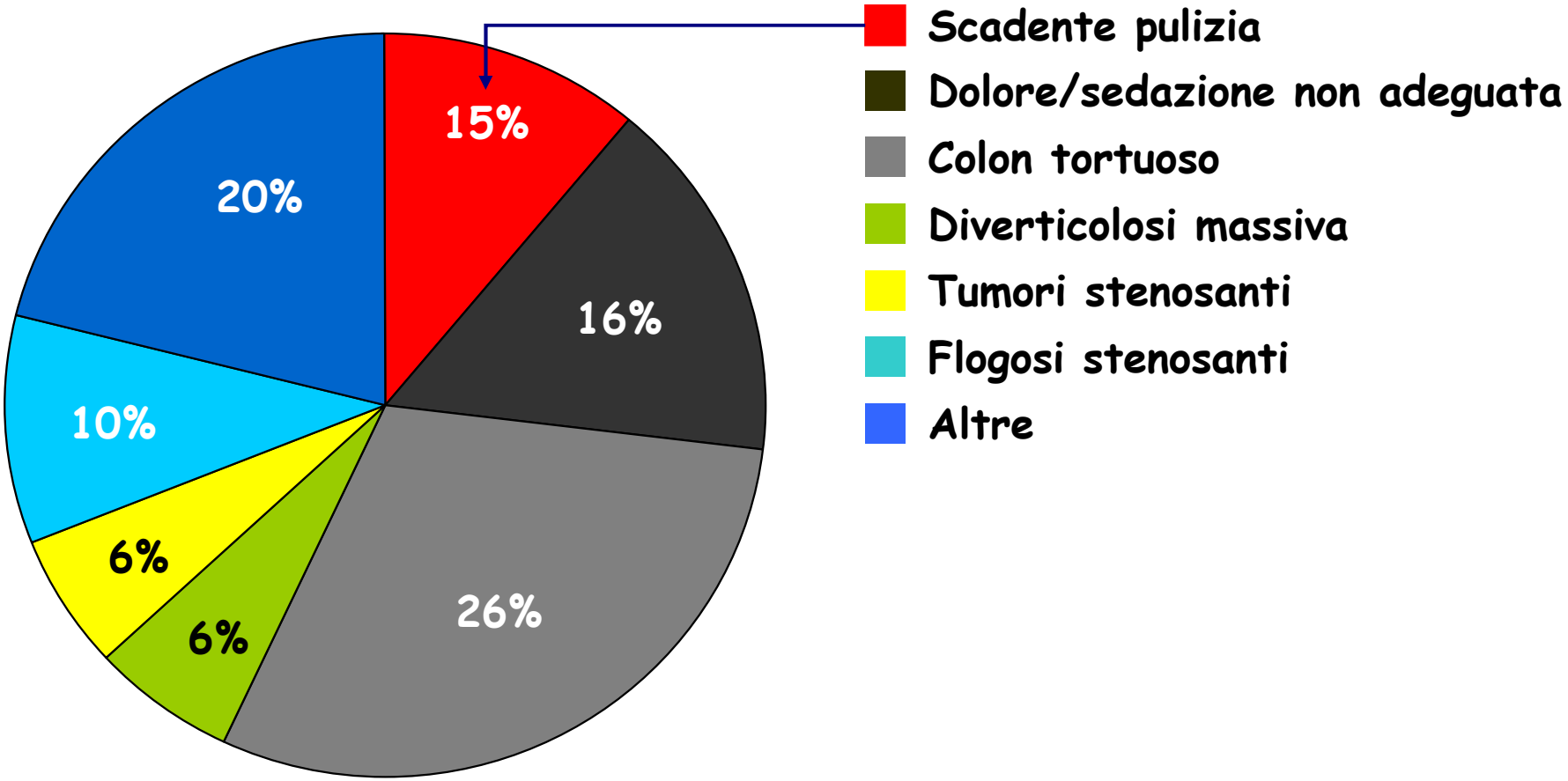
La Preparazione Intestinale

Dr G. Aragona
U.O. Complessa di Gastroenterologia ed Epatologia
Ospedale Civile - Piacenza



Fattori che determinano una colonscopia incompleta



Brahamania et al Can J Gastroenterol 2012

American Journal of Gastroenterology
ISSN 0002-9270
Copyright © 2006 by the American College of Gastroenterology and the American Society for Gastrointestinal Endoscopy
doi: 10.1111/j.1572-0241.2006.00673.x
Published by Blackwell Publishing

Quality Indicators for Colonoscopy

Douglas K. Rex, M.D., John L. Petrini, M.D., Todd H. Baron, M.D., Amitabh Chak, M.D., Jonathan Cohen, M.D., Stephen E. Deal, M.D., Brenda Hoffman, M.D., Brian C. Jacobson, M.D., M.P.H., Klaus Mergener, M.D., Ph.D., Bret T. Petersen, M.D., Michael A. Safdi, M.D., Douglas O. Faigel, M.D., ASGE Co-Chair, Irving M. Pike, M.D., ACG Co-Chair
ASGE/ACG Taskforce on Quality in Endoscopy

Am J Gastroenterol 2006

Una buona preparazione

- ⇑ facilità dell'esame endoscopico
- ⇑ la % di raggiungimento cieco (>90%)
- ⇑ detection rate di lesioni (superficiali)
- ⇑ sicurezza (se perforazione)
- ⇓ il tempo di raggiungimento cieco
- ⇓ i tempi di sedazione e gli effetti collaterali annessi
- ⇓ i costi di follow-up ravvicinati per scadente toelette

La Preparazione Intestinale
Le linee-guida

CONSENSUS DOCUMENT

Preamble

Gastrointest Endosc 2006

The following "Consensus Document on Bowel Preparation for Colonoscopy" is the culmination of an exceptional cooperative effort by 3 leading gastrointestinal societies. For over a year, a tripartite task force with representation from the American Society for Gastrointestinal Endoscopy, the American Society of Colon and Rectal Surgeons, and the Society of American Gastrointestinal and Endoscopic Surgeons has worked diligently to prepare this state of the art review. The comprehensive document is evidence based and a valuable resource for all physicians who perform colonoscopy. In addition to a critical scientific review of existent data, the document provides practical information on the manufacturers and pricing of available products used in bowel preparation. The governing bodies document, which is to be published contemporaneously by the respective journals of each society. All who worked on this project should be congratulated for this practical contribution that will enhance the quality patient care that the members of all 3 societies provide on a daily basis.

Robert H. Hawes
President
American Society for Gastrointestinal Endoscopy (ASGE)
Ann Lowry
President
American Society of Colon and Rectal Surgeons
Dan Deziel
President

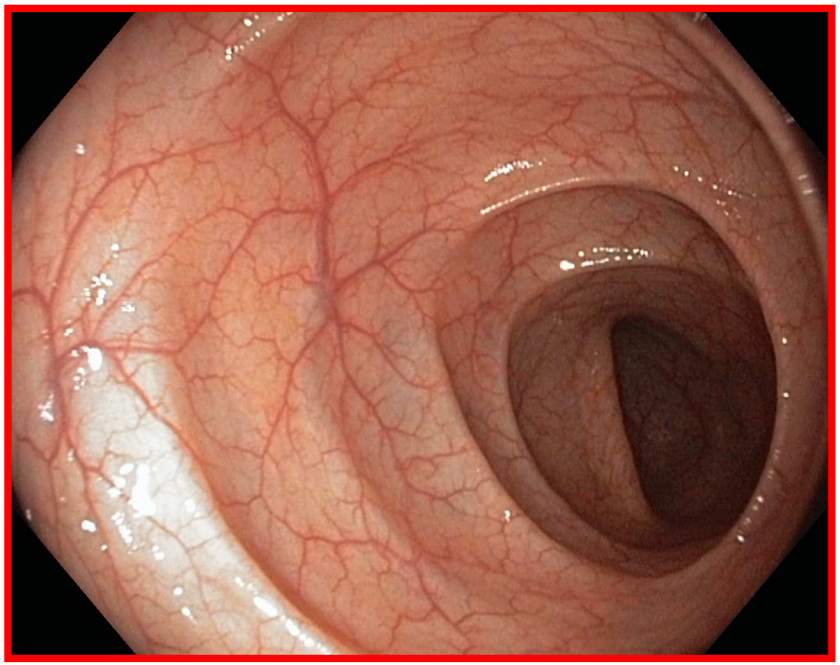
Per la ACG e la task force ASCRS/ASGE/SAGES una preparazione è adeguata se permette di vedere polipi >5mm (?)

A consensus document on bowel preparation before colonoscopy: Prepared by a Task Force From The American Society of Colon and Rectal Surgeons (ASCRS), the American Society for Gastrointestinal Endoscopy (ASGE), and the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES)

La preparazione ideale……..”da desiderio”

Deve essere

- Facile da assumere, buona palatabilità
- Rapida ed efficace nella pulizia colica
- Preservare aspetto micro/macroscopico mucosa
- Sicura e ben tollerata

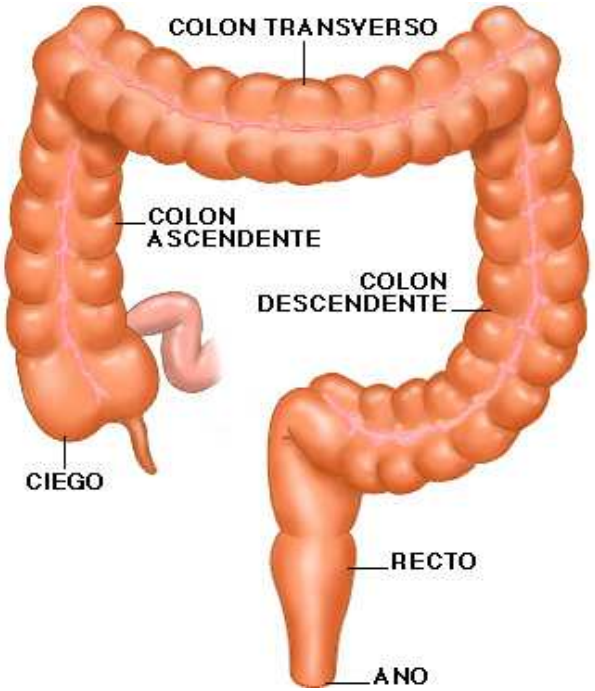


Task Force ASCR/ASGE/SAGE et al GIE 2006

Catartici per la preparazione intestinale

3 gruppi

1. Soluzioni a base di PEG (bassi/alti volumi)
2. Catartici a base di NaP
3. Catartici contenenti Magnesio citrato o sodio Picosolfato



Catartici per la preparazione intestinale

1°gruppo

1. Soluzioni a base di PEG (bassi/alti volumi)

- PEG o macrogol è un polimero inerte di ossido di etilene, non assorbibile con PM elevato (3350-4000Da). Solitamente somministrato in soluzione elettrolitica (PEG-ELS) per ottenere la stessa osmolarità del plasma.
- Come risultato dell'effetto osmotico, la soluzione di PEG ed elettroliti, determina l'escrezione di feci liquide
- Spesso viene aggiunto simeticone come "antibolle" ed evitare combustioni (rare ma possibili)
- I solfati sono stati sostituiti (Lovol-esse®) o ridotti (Moviprep®) a favore dei citrati/ascorbati con riduzione dei volumi (*low-volume*)
- Ottima tollerance e rare turbe idro-elettrolitiche
- Segnalate coliti ischemiche col Bisacodile

Task Force ASCR/ASGE/SAGE et al GIE 2006

Catartici per la preparazione intestinale

2°gruppo

2. Catartici a base di NaP

- Sono *soluzioni iperosmotiche* a basso volume nel tentativo di incrementare la compliance del paziente
- Si ottiene ottima pulizia, ma hanno scarsa sicurezza a causa delle proprietà ipertoniche (*alterazioni idro-elettrolitiche*)
- Possibile insorgenza di nefropatia acuta da fosfato (1/1000pz)
- Fattori di rischio per APN: <55kg, >60aa, IRC, cardiopatia congestizia, Diabete M, FANS, sartani e ACEi
- Rischio di lesioni macro-microscopiche di mucosa sigma (afte, erosioni, eritema). DD con IBD

Task Force ASCR/ASGE/SAGE et al GIE 2006

Bowel cleansing for colonoscopy: prospective randomized assessment of efficacy and of induced mucosal abnormality with three preparation agents

Authors I. C. Lawrance[1,2], R. P. Willert[1], K. Murray[3]

Institutions
[1] Centre for Inflammatory Bowel Diseases, Fremantle Hospital, Fremantle, Western Australia
[2] University Department of Medicine and Pharmacology, University of Western Australia, Fremantle Hospital, Fremantle, Western Australia
[3] Statistical Consulting Group, School of Mathematics and Statistics, University of Western Australia, Perth, Western Australia

Endoscopy 2011

Patient characteristics	Bowel preparation (n = 634)		
	PEG	NaP	Pico
Patients, n (%)	284 (45)	179 (28)	171 (27)
Age, mean ±SD, years	53.2 ± 13.1	52.7 ± 12.1	55.3 ± 12.6
< 40 years, n (%)	41 (14)	22 (12)	18 (11)
40 – 49 years, n (%)	58 (20)	43 (24)	36 (21)
50 – 59 years, n (%)	85 (30)	56 (31)	50 (29)
60 – 69 years, n (%)	76 (27)	48 (27)	44 (26)
70 – 74 years, n (%)	24 (9)	10 (6)	23 (14)
Male, n (%)	127 (45)	83 (46)	82 (48)
Primary indication, n (%)			
Abdominal pain	23 (8)	15 (8)	18 (11)
Altered bowel habit	66 (23)	34 (19)	24 (14)
Bleeding/anemia	124 (44)	71 (40)	71 (42)
Screening	60 (21)	56 (31)	54 (32)
Weight loss/miscellaneous	11 (4)	3 (2)	4 (2)

NaP, sodium phosphate; PEG, polyethylene glycol; Pico, sodium picosulphate.

Lesioni mucose indotte da NaP e Picosolfato Vs PEG

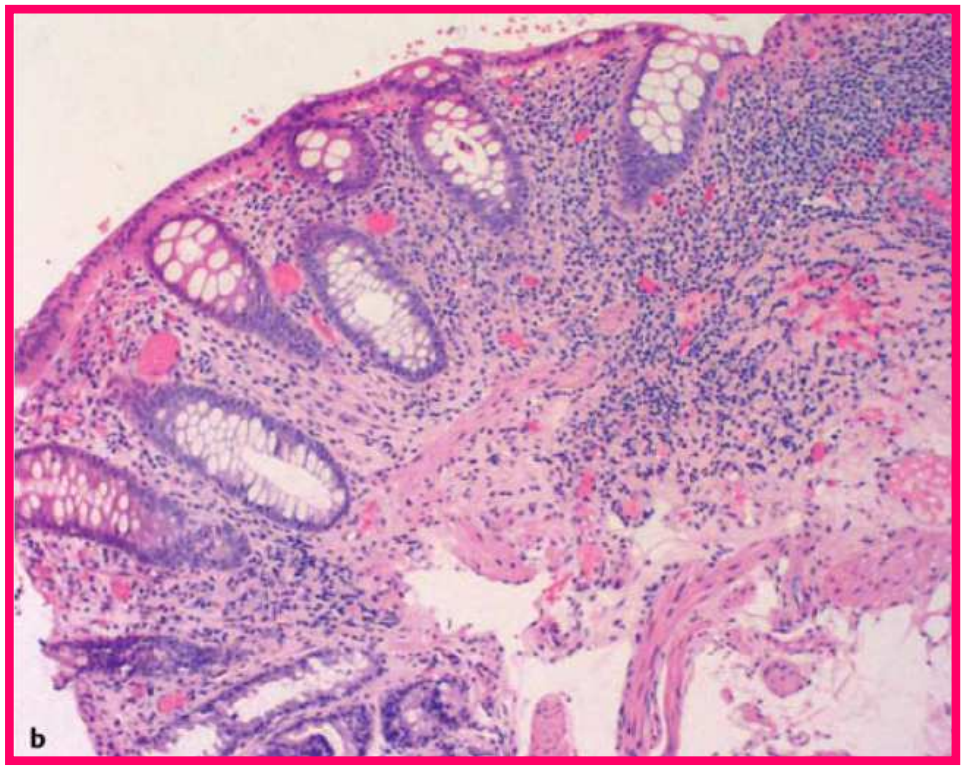
Bowel preparation	Macroscopic findings	Microscopic findings
PEG	Aphthous ulceration of ileum and erythema of cecum	Mild active ileocolitis
NaP	Aphthous ulceration of rectum	Mild nonspecfic active colitis
NaP	Aphthous ulceration of rectum	Mild nonspecfic active colitis
NaP	Aphthous ulceration of rectum	Mild nonspecfic active colitis
NaP	Aphthous ulceration of sigmoid colon	Mild nonspecfic active colitis
NaP	Erythema of sigmoid colon	Focal active colitis
NaP	Erythema of cecum	Mild active colitis
Pico	Erythema (patchy) throughout colon,	Nonspecfic active colitis
Pico	Erythema of sigmoid colon	Focal active colitis
Pico	Erythema of rectum	Focal nonspecfic active proctitis
Pico	Aphthous ulceration of sigmoid colon	Focal ulceration with active colitis
Pico	Erythema of sigmoid colon	Nonspecific focal active colitis
Pico	Erythema of rectum	Mild nonspecfic active proctitis

Lesioni indotte da NaP e Pico sono **10 volte** maggiori del PEG (p=0.03)

Lawrance et al Endoscopy 2011

Lesioni mucose indotte da NaP e Picosolfato Vs PEG

Mucosa sigma



Flogosi ed edema adiacente alle cripte con incremento PMN sulla superficie epiteliale

Nel 2008 NaP ritirato dal mercato in USA e Canada

Lawrance et al Endoscopy 2011

Catartici per la preparazione intestinale

3° gruppo

3. Catartici contenenti Magnesio citrato o sodio picosolfato

- Lassativi salini iperosmotici, stimolano il rilascio di CCK
- Le preparazioni con solo Magnesio citrato sono poco efficaci. Con l'aggiunta di Picosolfato (Citrafleet® – Picoprep ®) sodico si ottiene una buona pulizia colica
- Possibile ipermagnesemia da eccessivo assorbimento in pz >65aa
- Non rare le reazioni allergiche, aritmie, convulsioni, epilessia

Task Force ASCR/ASGE/SAGE et al GIE 2006

CONSENSUS DOCUMENT

Preamble

GIE 2006

A consensus document on bowel preparation before colonoscopy: Prepared by a Task Force From The American Society of Colon and Rectal Surgeons (ASCRS), the American Society for Gastrointestinal Endoscopy (ASGE), and the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES)

La dieta

Recommendations. Dietary modifications alone, such as a clear liquid diet are inadequate for colonoscopy. However they have proven to be a beneficial adjunct to other mechanical cleansing methods (Grade IIB).

CONSENSUS DOCUMENT

Preamble

GIE 2006

A consensus document on bowel preparation before colonoscopy: Prepared by a Task Force From The American Society of Colon and Rectal Surgeons (ASCRS), the American Society for Gastrointestinal Endoscopy (ASGE), and the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES)

I clisteri

Evidence. The evidence is mostly anecdotal with no recent prospective trials (Grade IIIB).

Recommendations. Use enemas in patients who present to endoscopy with a poor distal colon preparation and in patients with a defunctionalized distal colon.

CONSENSUS DOCUMENT

Preamble

GIE 2006

A consensus document on bowel preparation before colonoscopy: Prepared by a Task Force From The American Society of Colon and Rectal Surgeons (ASCRS), the American Society for Gastrointestinal Endoscopy (ASGE), and the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES)

Irrigazione rettale pulsata

Recommendations. Rectal pulsed irrigation administered immediately before the procedure combined with magnesium citrate given the evening before the procedure is a reasonable alternative to full-volume (4-liters) PEG in those individuals who cannot tolerate per oral administration of PEG (Grade IIB).

Supplemento GIED 3/2011

Meccanismo d'azione e farmacocinetica delle formulazioni utilizzate

Preparazione	Meccanismo d'azione	Farmacocinetica	Nome	Titolare	Dosaggio e Confezioni	Costo EURO
PEG-ELS macrogol NaCl KCl $NaHCO_3$ Na_2So_4	Bloccano l'assorbimento si acqua e sodio aumentando il volume del contenuto intestinale e la peristalsi	Il PEG non è assorbito e transita lungo il tratto GI. Lo 2,5% assorbito viene escreto nelle urine	**ISOCOLAN®** **SELG 1000®** **SELG ESSE®** **Klean Prep®** **4L**	Giuliani Promefarm Promefarm Norgine	8 buste (34,8gr) 4 buste (70gr) 4 buste (70gr) 4 buste (68gr)	11,38 12,90 13,10 11,60
PEG-CS macrogol, NaCL, citrati KCl, bisacodile	Soluzione isosmotica con l'ambiente extra-cellulare impedendo ulteriori scambi idro-elettrolitici	Come sopra	**LOVOl esse®** **Lovol dyl®** **2L**	Promefarm Promefarm	4 buste (64gr) 4cp (5gr)	12,30 2,20
PEG-ASC macrogol NaCl KCl, Na_2So_4 ascorbati	Soluzioni iperosmotiche. Richiamano acqua nel lume	Come sopra	**Moviprep®** **2L**	Norgine	2 buste	16
Catartici a base di **NaP NaH_2Po_4**	Richiamano acqua dal plasma al lume stimolando peristalsi	Il NaP è un sale assorbibile. Il 72% è escreto nelle feci. Il 28% viene assorbito (pericolo)	**Phospho-lax®** **2L**	Sofar	2 buste (20ml)	4,50 14
Catartici a base di **magnesio citrato, Picosolfato**	Il magnesio stimola la peristalsi e il rilascio di CCK aumentando la concentrazione di elettroliti nel lume	Nessun assorbimento rilevante. Tossicità da magnesio in pz con IRC	**CitraFleet®** **Picoprep®** **2L**	IBI Ferring	2bust(15gr) 2 bust(16gr)	13 13

■ **Preparazioni isosmotiche**
□ **Preparazioni iperosmotiche**

Scarpignato et al Suppl GIED 3/2011

Proprietà chimico-fisiche e assorbimento sistemico

Preparazione	Osmolarita' (mosm/kg)	Assorbimento dei Principi attivi	Alterazioni elettrolitiche		Altri eventi avversi
			FREQUENZA	GRAVITA'	
PEG-ELS (4L)	288	PEG: trscurabile Solfati: scarso	+	++	Ab ingestis Mallory-Weiss Reaz. Allergiche
PEG-CS (2L) + bisacodile	293	PEG: trascurabile Citrati: scarso Bisacodile: trscurabile	+	+	Reaz Allergiche
PEG-ASC (2L+1L)	553*	PEG: trascurabile Solfati: scarso Ascorbati: moderato	++	+	Reaz. Allergiche
Magnesio citrato, Picosolfato (2L)	405*	Magnesio: moderato Picosolfato: trascurabile	+++	++	Reaz. Allergiche Aritmie Convulsioni Epilessia
NaP NaH_2Po_4 (2L)	1.331*	Fosfati: moderato	++++	++++	Nefropatia Convulsioni Epilessia Afte(sigma)

* Formulazioni iperosmotiche

dd con IBD

Scarpignato et al Suppl GIED 3/2011

American Journal of Gastroenterology
© 2008 by Am. Coll. of Gastroenterology
Published by Blackwell Publishing
2008
ISSN 0002-9270
doi: 10.1111/j.1572-0241.2007.01708.x

ORIGINAL CONTRIBUTIONS

Endoscopy

Randomized Trial of Low-Volume PEG Solution *Versus* Standard PEG + Electrolytes for Bowel Cleansing Before Colonoscopy

Christian Ell, M.D., Ph.D.,[1] Wolfgang Fischbach, M.D., Ph.D.,[2] Hans-Joachim Bronisch, M.D.,[3] Stefan Dertinger, M.D.,[4] Peter Layer, M.D., Ph.D.,[5] Michael Rünzi, M.D.,[6] Thomas Schneider, M.D., Ph.,D.,[7] Günther Kachel, M.D.,[8] Jörg Grüger, M.D.,[9] Michael Köllinger, M.D.,[10] Waltraud Nagell, M.D.,[11] Karl-Josel Goerg, M.D.,[12] Roland Wanitschke, M.D., Ph.D.,[13] and Hans-Jürgen Gruss, M.D.[14]

[1]*Dr. Horst Schmidt Kliniken GmbH, Wiesbaden, Germany;* [2]*Klinikum Aschaffenburg, Aschaffenburg, Germany;* [3]*Katholisches Krankenhaus St. Johann Nepomuk, Erfurt, Germany;* [4]*Kreiskrankenhaus Tirschenreuth, Tirschenreuth, Germany;* [5]*Israelitisches Krankenhaus, Hamburg, Germany;* [6]*Kliniken Essen-Süd–Katholisches Krankenhaus St. Josef gGmbH, Essen, Germany;* [7]*Klinikum Fürth, Fürth, Germany;* [8]*Klinikum Dachau, Dachau, Germany;* [9]*Städtische Kliniken Frankfurt-Höchst, Frankfurt/Main, Germany;* [10]*Klinikum St. Marien, Amberg, Germany;* [11]*Bürgerhospital Frankfurt am Main e.V., Frankfurt/Main, Germany;* [12]*Kliniken St. Antonius, Wuppertal, Germany;* [13]*Universitätsklinik Mainz, Mainz, Germany; and* [14]*Norgine Ltd., R&D Division, Harefield, United Kingdom*

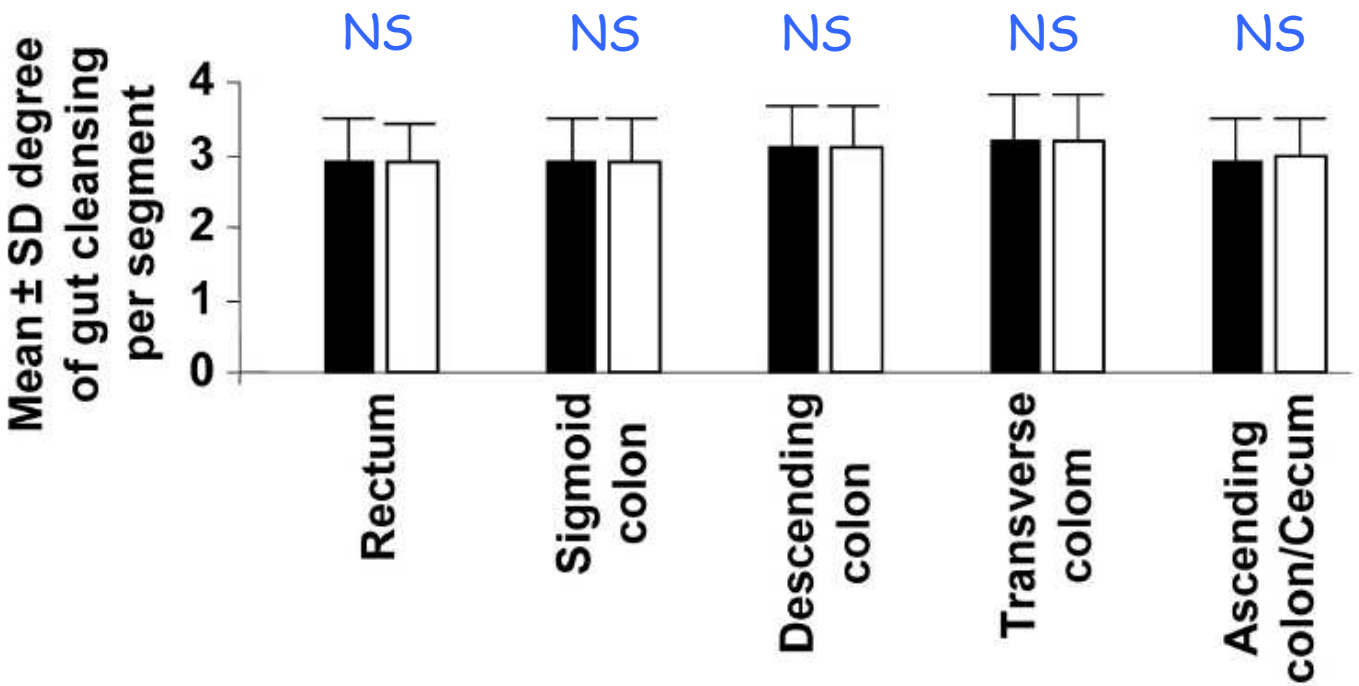
Multicentrica su PEG-ASC Vs PEG-ELS (entrambi SPLIT)

180pz
1L+1L

179pz
2L+2L

Multicentrica su PEG-ASC Vs PEG-ELS (entrambi SPLIT)

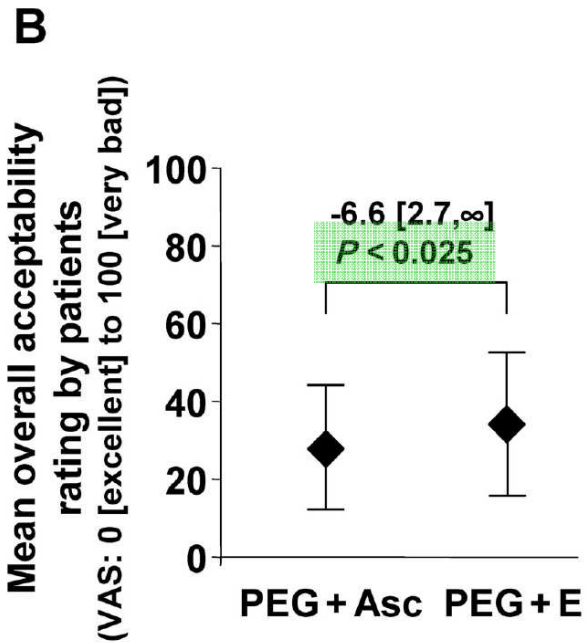
Grado di pulizia colica ottenuta



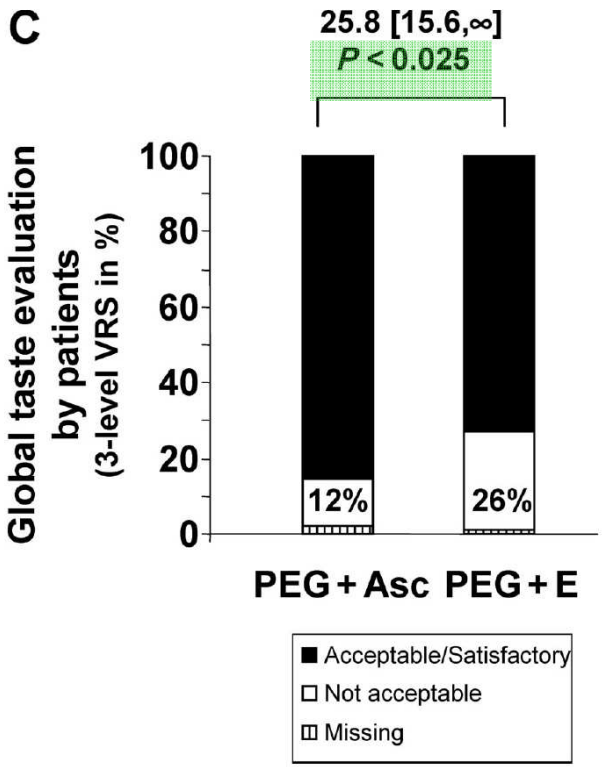
Ell et al Am J Gastroenterol 2008

Multicentrica su PEG-ASC Vs PEG-ELS (entrambi SPLIT)

Accettabilità



Palatabilità



Ell et al Am J Gastroenterol 2008

Fattori associati a pulizia inadeguata

Multivariata per la detection dei fattori legati a scatente pulizia

Variable	OR (95% confidence interval)	*P* value
Clinical		
Liver cirrhosis requiring active treatment[a]	5.0 (2.6–10.4)	<.001
Parkinson disease requiring active treatment[a]	3.2 (1.2–9.3)	.03
Diabetes requiring active treatment[a]	1.8 (1.3–2.5)	<.001
Previous colorectal surgeries[a]	1.6 (1.2–2.2)	.001
Male sex[a]	1.2 (1.02–1.5)	.001
BMI[a,b]	1.1 (1.03–1.1)	<.001
Age[a,b]	1.01 (1.004–1.02)	.002
Positive fecal occult blood test[a]	0.6 (0.5–0.8)	<.001
Preparation-related/setting-related		
<75% adherence to preparation instructions	3.1 (2.4–4.1)	<.001
Only written disposal of preparation instruction	1.5 (1.2–1.8)	<.001
Time interval between end of preparation and colonoscopy[b]	1.03 (1.007–1.1)	.01
Willingness to repeat preparation	0.7 (0.5–0.8)	<.001
Split preparation	0.7 (0.4–0.96)	.03
Sennosides	0.4 (0.3–0.6)	<.001

Nello screening c'e' personale preposto

Hassan et al Clin Gast Hepatol 2012

ORIGINAL ARTICLE: Clinical Endoscopy

Gastroint Endosc 2011

Bowel preparation with split-dose polyethylene glycol before colonoscopy: a meta-analysis of randomized controlled trials CME

Todd W. Kilgore, MD, Abdillahi A. Abdinoor, MD, Nicholas M. Szary, MD, Samuel W. Schowengerdt, BS, Jamie B. Yust, BS, Abhishek Choudhary, MD, Michelle L. Matteson, APN, Srinivas R. Puli, MD, John B. Marshall, MD, Matthew L. Bechtold, MD

Columbia, Missouri; Peoria, Illinois, USA

5 studi inclusi

Author	Type of study	Blinding	Location	No. of patients	Bowel preparation scale	Split-dose (evening before day of procedure)
Aoun et al, 2005[7]	RCT	Single	Lebanon	141	Aronchick	2 L–2 L
Abdul-Baki et al, 2008[8]	RCT	Single	Lebanon	196	Aronchick	2 L–2 L
Park JS et al, 2007[6]	RCT	Single	South Korea	303	Ottawa	3 L–1 L
Park SS et al, 2010[9]	RCT	Single	South Korea	159	Aronchick	2 L–2 L
Marmo et al, 2010[10]	RCT	Single	Italy	433	Ottawa	2 L–2 L

Kilgore et al GIE 2011

ORIGINAL ARTICLE: Clinical Endoscopy

Gastroint Endosc 2011

Bowel preparation with split-dose polyethylene glycol before colonoscopy: a meta-analysis of randomized controlled trials CME

Todd W. Kilgore, MD, Abdillahi A. Abdinoor, MD, Nicholas M. Szary, MD, Samuel W. Schowengerdt, BS, Jamie B. Yust, BS, Abhishek Choudhary, MD, Michelle L. Matteson, APN, Srinivas R. Puli, MD, John B. Marshall, MD, Matthew L. Bechtold, MD

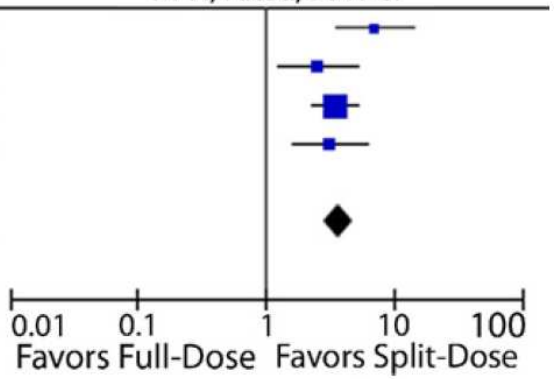
Columbia, Missouri; Peoria, Illinois, USA

Netto vantaggio sulla pulizia colica con split-dose

Study or Subgroup	Split-Dose Events	Total	Full-Dose Events	Total	Weight	Odds Ratio M-H, Fixed, 95% CI
Abdul-Baki et al	92	107	41	89	12.4%	7.18[3.61, 14.27]
Aoun et al	52	68	41	73	18.4%	2.54 [1.23, 5.24]
Marmo et al	160	218	95	215	50.3%	3.48 [2.33, 5.22]
Park SS et al	61	80	40	79	18.9%	3.13 [1.59, 6.17]
Total (95%CI)		473		456	100.0%	3.70 [2.79, 4.91]
Total events	365		217			

Heterogeneity: $Chi^2 = 4.94$, df = 3 (P = .18); $I^2 = 39\%$

Test for overall effect: Z = 9.07 (P < .00001)



Kilgore et al GIE 2011

ORIGINAL ARTICLE: Clinical Endoscopy

Gastroint Endosc 2011

Bowel preparation with split-dose polyethylene glycol before colonoscopy: a meta-analysis of randomized controlled trials CME

Todd W. Kilgore, MD, Abdillahi A. Abdinoor, MD, Nicholas M. Szary, MD, Samuel W. Schowengerdt, BS, Jamie B. Yust, BS, Abhishek Choudhary, MD, Michelle L. Matteson, APN, Srinivas R. Puli, MD, John B. Marshall, MD, Matthew L. Bechtold, MD

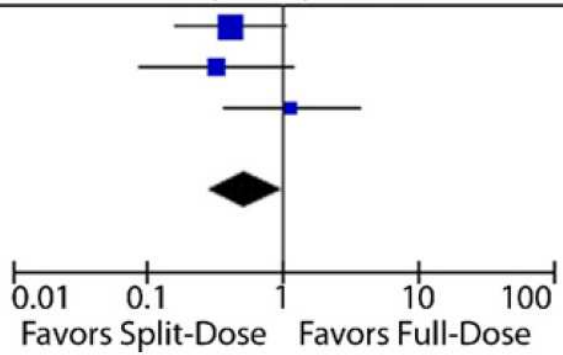
Columbia, Missouri; Peoria, Illinois, USA

Riduzione del numero di preparazioni incomplete

Study or Subgroup	Split-Dose Events	Split-Dose Total	Full-Dose Events	Full-Dose Total	Weight	Odds Ratio MH, Fixed, 95% CI
Aoun et al	7	68	16	73	48.9%	0.41 [0.16, 1.07]
Marmo et al	3	218	9	215	31.6%	0.32 [0.09, 1.20]
Park SS et al	7	80	6	79	19.5%	1.17 [0.37, 3.64]
Total (95% CI)		366		397	100.0%	0.53 [0.28, 0.98]
Total events	17		31			

Heterogeneity: $Chi^2 = 2.70$, df = 2 (P = .26); $I^2 = 26\%$

Test for overall effect: Z = 2.01 (P = .04)



Kilgore et al GIE 2011

ORIGINAL ARTICLE: Clinical Endoscopy

Gastroint Endosc 2011

Bowel preparation with split-dose polyethylene glycol before colonoscopy: a meta-analysis of randomized controlled trials CME

Todd W. Kilgore, MD, Abdillahi A. Abdinoor, MD, Nicholas M. Szary, MD, Samuel W. Schowengerdt, BS, Jamie B. Yust, BS, Abhishek Choudhary, MD, Michelle L. Matteson, APN, Srinivas R. Puli, MD, John B. Marshall, MD, Matthew L. Bechtold, MD

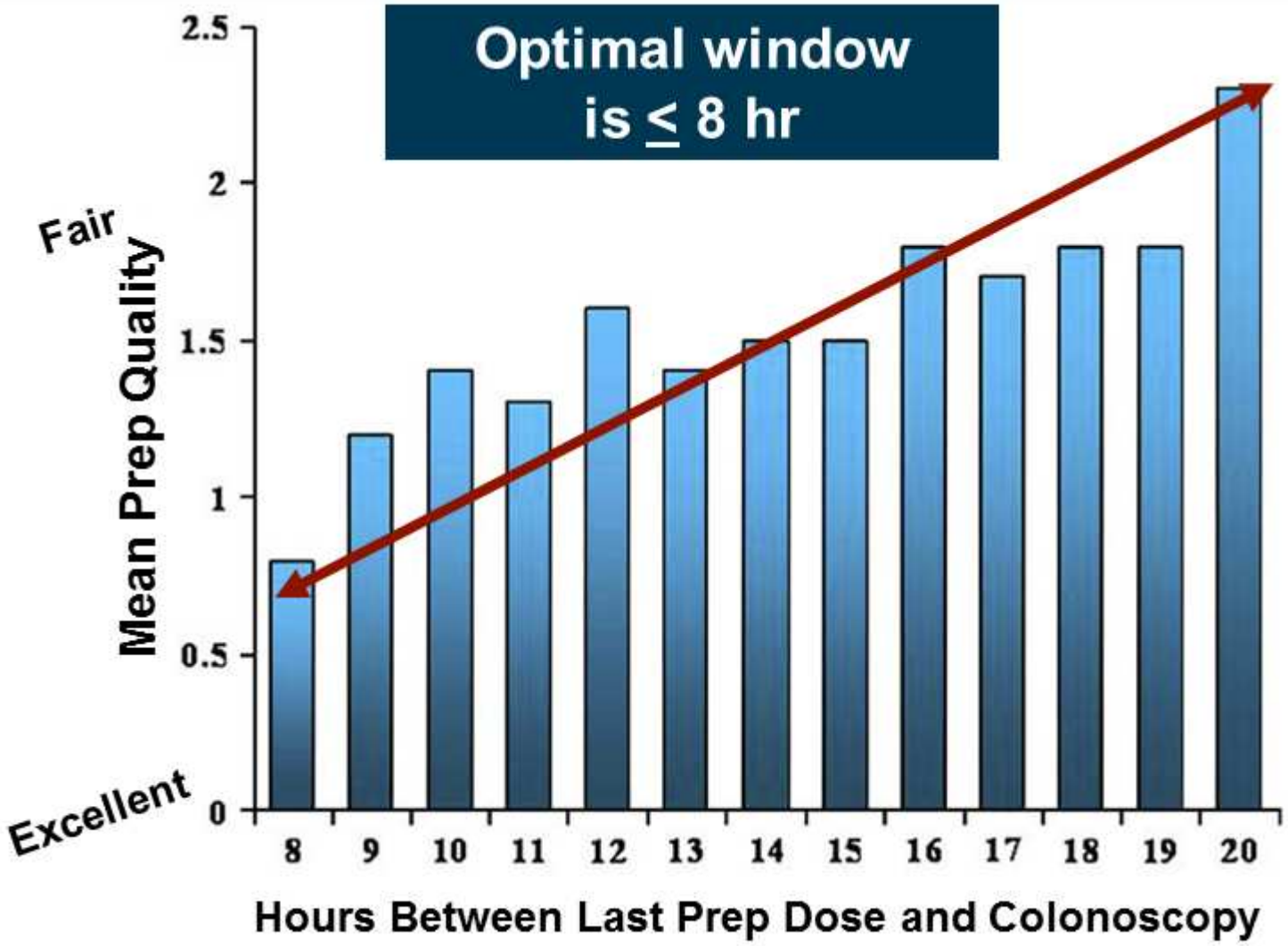
Columbia, Missouri; Peoria, Illinois, USA

Nessuna differenza sugli effetti collaterali Split Vs no Split

Side effect	OR	95% CI	*P* value	Significance
Abdominal cramping	0.75	0.52-1.10	.14	NS
Abdominal bloating	0.92	0.42-2.01	.84	NS
Vomiting	0.51	0.20-1.34	.17	NS
Sleep disturbance	0.78	0.55-1.12	.18	NS
Missing work or school	0.72	0.38-1.38	.32	NS

Kilgore et al GIE 2011

SPLIT-dosage
Quale è l'intervallo ottimale tra ultima dose e colonscopia ?



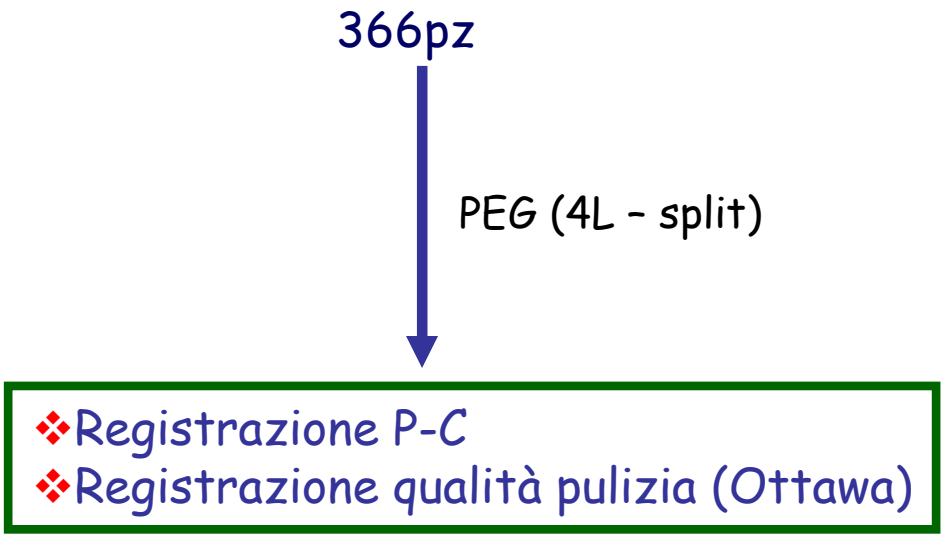
Siddiqui et al Gastroint Endosc 2009

ORIGINAL ARTICLE: Clinical Endoscopy

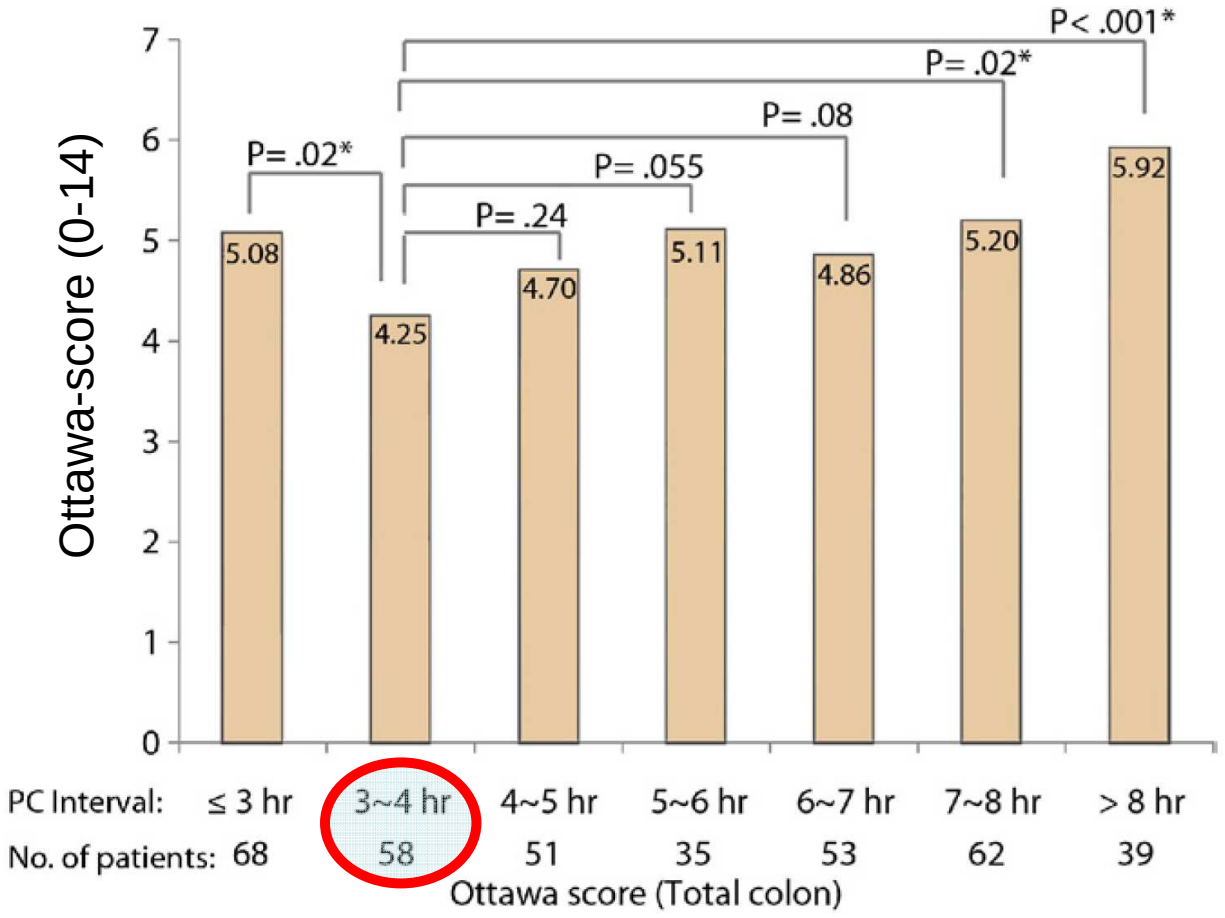
Gastroint Endosc 2012

Optimal preparation-to-colonoscopy interval in split-dose PEG bowel preparation determines satisfactory bowel preparation quality: an observational prospective study

Eun Hee Seo, MD, Tae Oh Kim, MD, Min Jae Park, MD, Hee Rin Joo, MD, Nae Yun Heo, MD, Jongha Park, MD, Seung Ha Park, MD, Sung Yeon Yang, MD, Young Soo Moon, MD, PhD

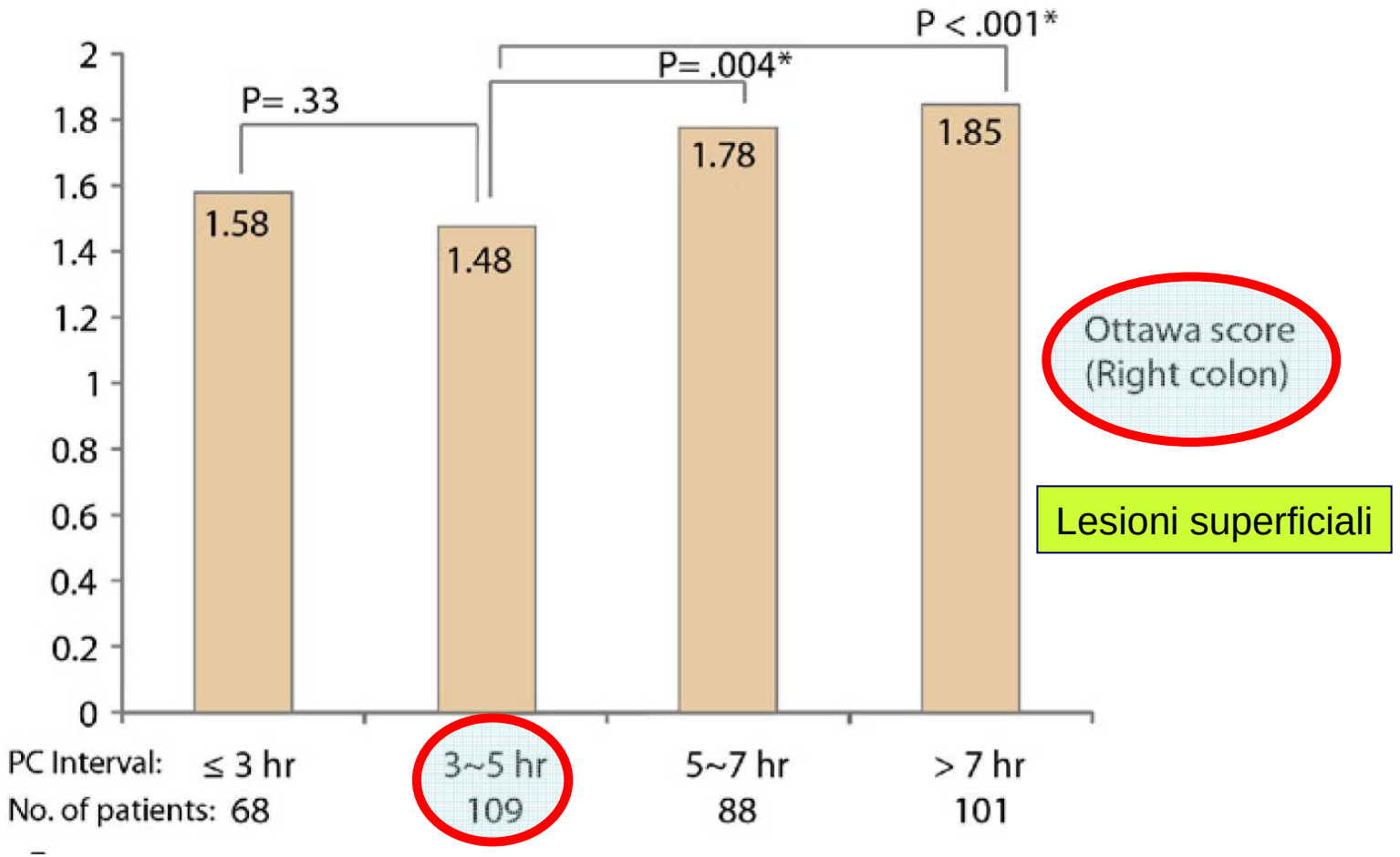


SPLIT-dosage
Quale è l'intervallo ottimale tra ultima dose e colonscopia ?



Seo et al Gastroint Endosc 2012

SPLIT-dosage
Quale è l'intervallo ottimale tra ultima dose e colonscopia ?



Seo et al Gastroint Endosc 2012

Raccomandazioni alimentari prima di procedure invasive

2 hours preprocedure: Clear liquid

- Water, fruit juice (no pulp), carbonated beverages, clear tea, coffee (no milk), no alcohol

6 hours preprocedure: Light meal

- Toast and clear liquid (no butter, fried or fatty food)

8 hours preprocedure: Solid food

ASA Anesthesiology 2011

SPLIT-dosage
Difficoltà a raggiungere l' ospedale ??

Pazienti con necessità di un bagno nel tragitto casa-ospedale

studi	SPLIT	No-SPLIT	P
Parra-Blanco et al	7,7%	9,1%	NS
Khan et al	5,8%	8,9%	NS

84% pazienti non infastiditi da svegliarsi presto per assumere split-dose

Parra-Blanco et al World J Gastr 2006
Khan et al Gastroint Endosc 2008

La Preparazione Intestinale
Le linee-guida

American College of Gastroenterology Guidelines for Colorectal Cancer Screening 2008

Douglas K. Rex, MD, FACG[1], David A. Johnson, MD, FACG[1], Joseph C. Anderson, MD[1], Phillip S. Schoenfeld, MD, MSEd, MSc (Epi), FACG[1], Carol A. Burke, MD, FACG[1] and John M. Inadomi, MD, FACG[1]

This document is the first update of the American College of Gastroenterology (ACG) colorectal cancer (CRC) screening recommendations since 2000. The CRC screening tests are now grouped into cancer prevention tests and cancer detection tests. Colonoscopy every 10 years, beginning at age 50, remains the preferred CRC screening strategy. It is recognized that colonoscopy is not available in every clinical setting because of economic limitations. It is also realized that not all eligible persons are willing to undergo colonoscopy for screening purposes. In these cases, patients should be offered an alternative CRC prevention test (flexible sigmoidoscopy every 5–10 years, or a computed tomography (CT) colonography every 5 years) or a cancer detection test (fecal immunochemical test for blood, FIT).

Am J Gastroenterol 2009; 104:739–750; doi:10.1038/ajg.2009.104; published online 24 February 2009

- Si consiglia assunzione in modalità Split
- Low-volume solution sono da preferire

La Preparazione Intestinale
CONCLUSIONI

- Fino al 21% di colonoscopie eseguite con preparazione inadeguata
- La pulizia intestinale è uno dei principali indicatori di qualita' per la colonscopia
- Su ogni referto colonscopico dovrebbe essere riportato il grado di pulizia
- Utilizzare preparazioni isosmotiche/iperosmotiche low-volume e riservare a casi selezionati il NaP
- Assumere la preparazione split anche se colonscopia al mattino
- 2h-5h intervallo ideale tra fine preparazione e colonscopia
- Se possibile, personalizzare la preparazione al tipo di paziente
- Dare istruzioni cartacea + colloquio incrementa il livello di pulizia


Fine

Contents lists available at SciVerse ScienceDirect

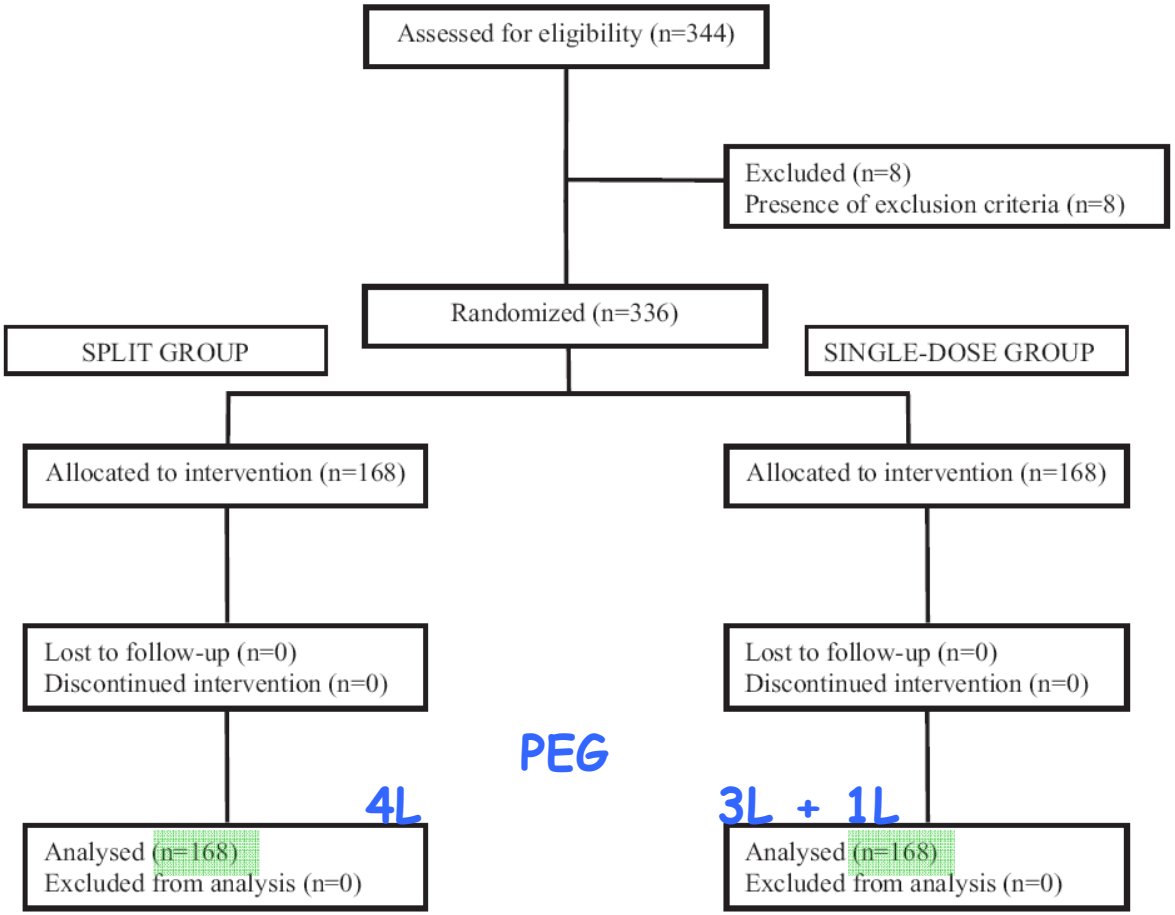
Digestive and Liver Disease

journal homepage: www.elsevier.com/locate/dld

Digestive Endoscopy

Bowel preparation with polyethylene glycol electrolyte solution: Optimizing the splitting regimen

Mauro Manno[a,*], Flavia Pigò[a], Raffaele Manta[a], Carmelo Barbera[a], Helga Bertani[a], Vincenzo Giorgio Mirante[a], Emanuele Dabizzi[a], Angelo Caruso[a], Gianpiero Olivetti[a], Cesare Hassan[b], Angelo Zullo[b], Rita Conigliaro[a]



Qualità della pulizia ottenuta

Bowel cleansing level	Split regimen (N = 168)	Full regimen (N =v168)	p value
Excellent; N (%)	115 (68.4)	63 (37.5)	<0.0001 *
Good; N (%)	45 (26.8)	93 (55.4)	
Fair; N (%)	4 (2.4)	5 (3.0)	0.7
Poor; N (%)	4 (2.4)	7 (4.1)	
Adequate (excellent/good)	160 (95.2)	156 (97.5)	0.9
Inadequate (fair/poor)	8 (4.8)	12 (2.5)	

* Se considerati insieme (*Excellent* + *Good*) non vi erano differenze significative

Manno et al Dig Liv Dis 2012

Compliance e side-effects

	Split regimen	Full regimen	*p* value
Intake <75% of 4 L volume; *N* (%)	6 (3.6)	9 (5.4)	0.7
Tolerability score (range: 1–4)	(2.2 ± 0.82)	(1.0 ± 0.4)	<0.0001
Side effects			
Nausea	4	10	<0.05
Vomiting	0	0	–
Abdominal pain	0	0	–
Abdominal bloating	5	5	0.4

Conclusioni

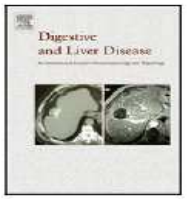
- Se colonscopia al mattino è meglio usare 3L + 1L
- Buona compliance e tollerance
- Studio futuro: PEG 2L + 2L Vs Peg 3L + 1L

Manno et al Dig Liv Dis 2012

Contents lists available at SciVerse ScienceDirect

Digestive and Liver Disease

journal homepage: www.elsevier.com/locate/dld



Digestive Endoscopy

Bowel preparation with polyethylene glycol electrolyte solution: Optimizing the splitting regimen

Mauro Manno[a,*], Flavia Pigò[a], Raffaele Manta[a], Carmelo Barbera[a], Helga Bertani[a], Vincenzo Giorgio Mirante[a], Emanuele Dabizzi[a], Angelo Caruso[a], Gianpiero Olivetti[a], Cesare Hassan[b], Angelo Zullo[b], Rita Conigliaro[a]

Background

- La somministrazione SPLIT è superiore alla non-SPLIT
- Possibile problema se colonscopia programmata al mattino
- Il paziente potrebbe non assumere i secondi 2L di PEG al mattino presto

Scopo

- Verificare tollerance e adeguatezza di una preparazione SPLIT di PEG

The Association for Coloproctology of Great Britain and Ireland for The Royal College of Surgeons

Consensus Guidelines for the Prescription and Administration of Oral Bowel Cleansing Agents

2010

The Association for Coloproctology of Great Britain and Ireland for The Royal College of Surgeons

The British Society of Gasteroenterology

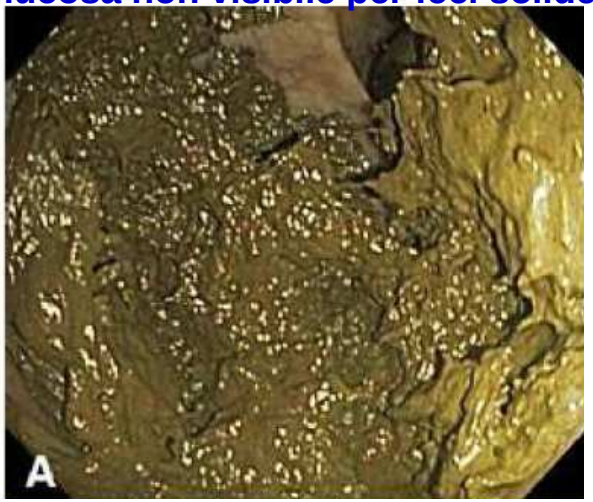
The British Society of Gastrointestinal and Abdominal Radiology

The Renal Association

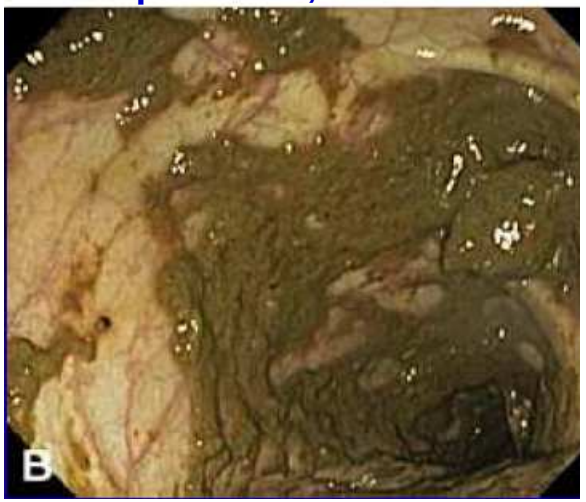
The Royal College of Radiologists

Cosa fare se la pulizia è inadeguata ?

Score 0
(mucosa non visibile per feci solide)



Score 1
(mucosa ipovisibile, feci semisolide)



- Riprogrammare nuovo esame il giorno dopo
- Se è stata assunta <75% di PEG ridare sempre PEG
- Se è stata assunta >75% di PEG sostituirlo con NaP
- Se è stata invece eseguita correttamente la preparazione:
  - ✓ Aggiungere bisacodile/senna/magnesio citrato
  - ✓ 2L di PEG h19 + 2L al mattino (3h prima)
  - ✓ Clistere con Laevolac al mattino

Negli USA l'assicurazione non sempre rimborsa la II colonscopia

Khashab et al GIE 2011

"Trucchi" per ottenere un' adeguata pulizia intestinale

- Motivare il paziente spiegando i vantaggi tecnici dell'assumere tutta la solusione (splittando anche con colonscopia programmata al mattino)
- Adesione alla dieta priva di scorie 2-3 gg prima dell'esame (pochi studi)
- Raffreddare la soluzione tra 7-10° prima di berla
- Aggiungere fette di limone o arancia
- Alternare sorsi di soluzione con limonata, coca-cola o altra bibita
- Bere la soluzione più lentamente di quanto prescritto (1L/1h $\Rightarrow$ 1L/2h)
- Se nausea persistente assume metoclopramide/levosulpiride

Khashab et al GIE 2011

Contents lists available at SciVerse ScienceDirect

Digestive and Liver Disease

journal homepage: www.elsevier.com/locate/dld

2012

Digestive Endoscopy

A randomized controlled trial evaluating a new 2-L PEG solution plus ascorbic acid vs 4-L PEG for bowel cleansing prior to colonoscopy

Flavio Valiante[a], Stefano Pontone[b,*], Cesare Hassan[c], Angelo Bellumat[a], Manuela De Bona[a], Angelo Zullo[c], Vincenzo de Francesco[d], Michele De Boni[a]

Non-Split

Variable	*N* (%)	
	2-L PEG + Asc	4-L PEG
Intention-to-treat patients	169	170
Per protocol patients (%)	166 (98)	166 (98)
Caecal intubation (%)[a]	155 (93.4)	157 (95)
Median age (range)	63 (36–82)	65 (42–85)
Male (%)	92 (55)	84 (51)
Indications (%)		
Follow-up	46 (28)	50 (30)
CRC screening	27 (16)	17 (10)
Bleeding	35 (21)	30 (18)
Change in bowel habits	36 (21)	43 (26)
Anaemia	3 (2)	9 (6)
Abdominal pain	19 (12)	17 (10)

Risultati sulla pulizia

Aronchick level	All colon (%)		
	2-L PEG + Asc	4-L PEG	*p*
Aronchick 1	38.3	29.4	0.1
Aronchick 2	39.4	33.2	0.3
Aronchick 3	8.5	14.4	0.1
Aronchick 4	9.2	18.7	0.02
Aronchick 5	4.6	4.3	1

Efficacia sovrapponibile

Valiante et al Dig Liv Dis 2012

Risultati sulla pulizia

Accettabilita’	N (%)		p
	2L-PEG + Asc	4L-PEG	
Exellent	66 (40)	38 (23)	0.01
Good	72 (43)	88 (53)	0.2
Bad	28 (17)	40 (24)	0.05

Piu’ accettabile

Valiante et al Dig Liv Dis 2012

La preparazione intestinale
I BAMBINI

- Pochi studi randomizzati controllati, datati
- 2 studi di confronto PEG Vs NaP hanno mostrato efficacia sovrapponibile
  - ✓ *Da Silva et al J. Pediatr Gastr Nut 1997*
  - ✓ *Grenuse et al J. Pediatr Gastr Nut 1995*
- PEG e NaP sono superiori magnesia/senna/bisacodile
  - ✓ *Dunt et al J. Pediatr Gastr Nut 1997*
- PEG è il prodotto da consigliare (somministrazione split)
- SNG spesso utile/indispensabile (attenzione aspirazione)

Task Force ASCR/ASGE/SAGE et al GIE 2006

La preparazione intestinale SICUREZZA

GUT 2012 Guidelines

Consensus guidelines for the safe prescription and administration of oral bowel-cleansing agents

Andrew Connor,[1] Damian Tolan,[2] Stephen Hughes,[3] Nick Carr,[4] Charles Tomson[3]

- I linea-guida appositamente creata per la safety
- Create per volere del UK National Patient Safety Agency (NPSA)
- In un periodo di 5aa segnalate 8 decessi e 258 effetti collaterali gravi
- IRA, ipovolemia, iponatriemia, ipermagnesemia, ipocalcemia le più segnalate
- Controindicazioni: occlusione, perforazione, IBD severa, ileostomia
- Le preparazioni isosmotiche sono generalmente più sicure (anche per ICC)
- ACEi e diuretici vanno sospesi il giorno prima della preparazione
- Possibile malassorbimento di farmaci (cause legali con contraccettivi)
- Segnalati gravi effetti secondari all'utilizzo di Gastrografin

Online Submissions: wjg.wjgnet.com
www.wjgnet.com
wjg@wjgnet.com

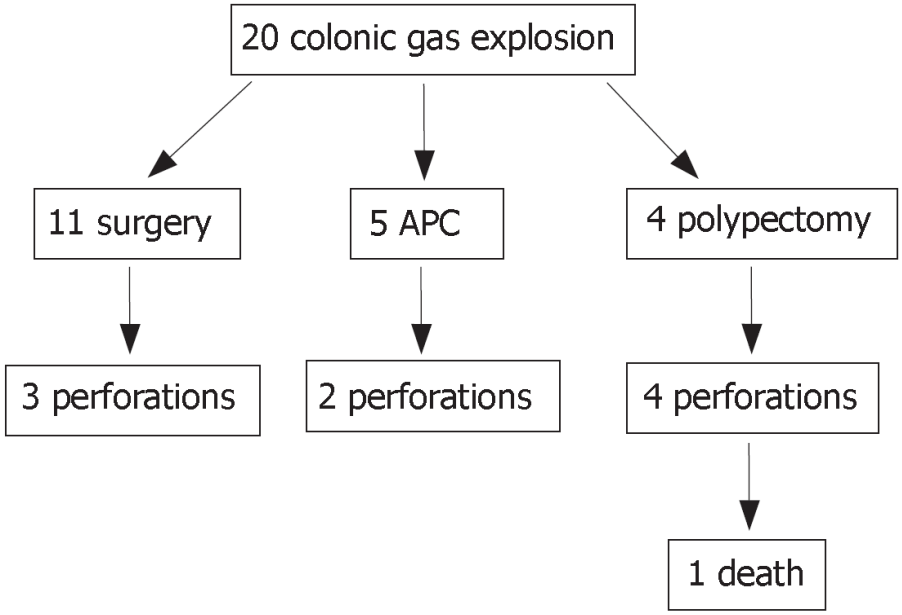
World J Gastroenterol 2007 October 28; 13(40): 5295-5298
World Journal of Gastroenterology ISSN 1007-9327

REVIEW

Colonic gas explosion during therapeutic colonoscopy with electrocautery

Spiros D Ladas, George Karamanolis, Emmanuel Ben-Soussan

Casi segnalati in letteratura 1952-2006



- 14 casi preparati con mannitolo/sorbitolo
- Scadente pulizia e rettosigmoidoscopia (fattori di rischio)
- Delle 5 esplosioni con APC 4 erano trattamenti di proctite attinica

ORIGINAL ARTICLE

Gastroint Endosc 2005

Impact of colonic cleansing on quality and diagnostic yield of colonoscopy: the European Panel of Appropriateness of Gastrointestinal Endoscopy European multicenter study

Florian Froehlich, MD, Vincent Wietlisbach, BA†, Jean-Jacques Gonvers, MD, Bernard Burnand, MD, MPH, John-Paul Vader, MD, MPH

(21 Centri – 11 Paesi)

5.832pz

56% PEG (4L – no split)
44% NaP (2L – no split)

Score pulizia 1-5
(score 5= perfetta pulizia)

Risultati

Accuratezza diagnostica della colonscopia è strettamente correlato al livello di pulizia colica

Qualità di pulizia e detection di polipi

		Polyp(s) of any size			
	No.	**Proportion (%)**	**OR***	**95% CI**	***p***
Cleansing quality					
Low	599	23.9	1.00		
Intermediate	902	32.8	1.73	1.28, 2.36	<0.001
High	4331	29.4	1.46	1.11, 1.93	0.007
Total	5832	29.4			

Froehlich et al GIE 2005

Qualità di pulizia e detection di cancro

		Cancer			
	No.	**Proportion (%)**	**OR***	**95% CI**	***p***
Cleansing quality					
Low	599	5.5	1.00		
Intermediate	902	6.0	1.26	0.78, 2.04	0.341
High	4331	2.7	0.68	0.45, 1.02	0.063
Total	5832	3.5			

NS

Froehlich et al GIE 2005

Qualità di pulizia e raggiungimento cieco

	No.	Completion* (%)	*p*
Cleansing quality			
Low	597	71.1	
Intermediate	899	90.1	<0.001
High	4294	90.4	<0.001
Total	5790	88.3	

Froehlich et al GIE 2005

Qualità di pulizia e difficoltà di esecuzione

		Difficulty of colonoscopy (%)			
	No.	**Easy**	**Intermediate**	**Difficult**	***p***
Cleansing quality					
Low	594	20.0	45.8	34.2	
Intermediate	897	33.1	51.5	15.4	<0.001
High	4311	49.1	38.5	12.4	<0.001
Total	5802	43.7	41.2	15.10	

Froehlich et al GIE 2005

ORIGINAL ARTICLE: Clinical Endoscopy

Gastroint Endosc 2012

Increased adenoma detection rate with system-wide implementation of a split-dose preparation for colonoscopy CME

Suryakanth R. Gurudu, MD, Francisco C. Ramirez, MD, M. Edwyn Harrison, MD, Jonathan A. Leighton, MD, Michael D. Crowell, PhD

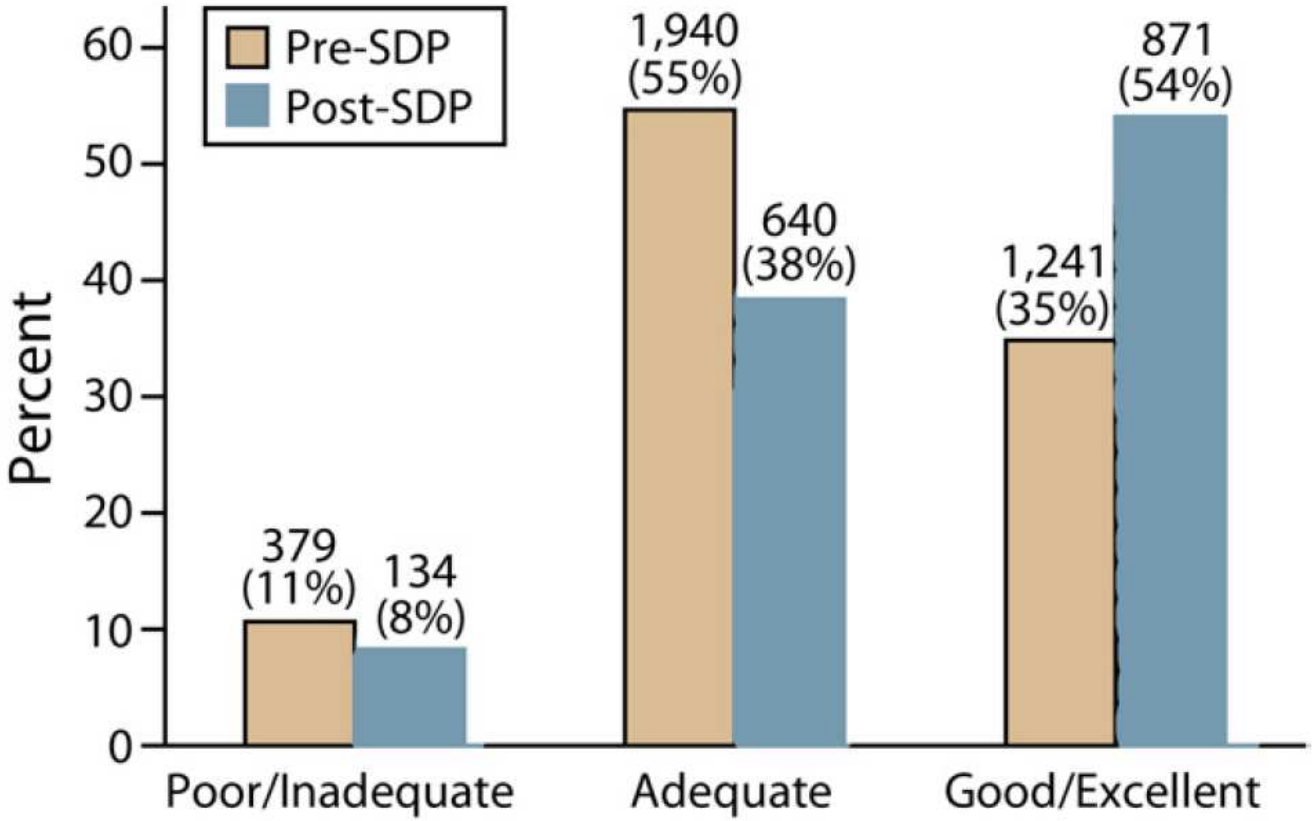
Scottsdale, Arizona, USA

TABLE 1. Patient demographics

	Before split dose	After split dose	*P* value
Number of patients	3560	1615	—
Age: mean (SD) y	62 (12)	61 (12)	.457
BMI: mean (SD) kg/m^2	27 (5)	28 (5)	.579
Female sex (%)	50	50	.969

BMI, Body mass index.

Qualità di pulizia pre-split Vs post-split



P<0.001

Gurudu et al GIE 2012

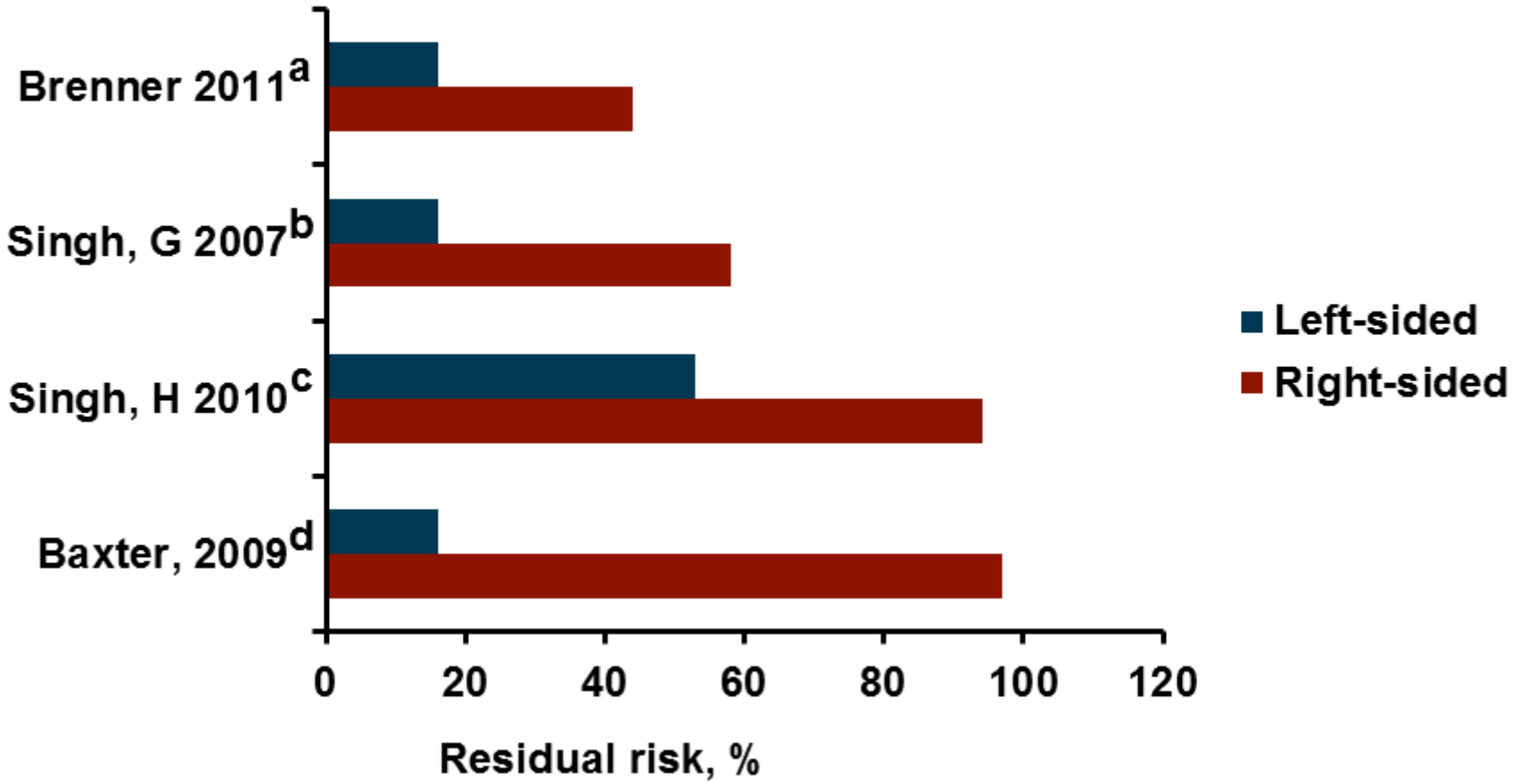
Adenoma detection rate pre-split Vs post-split

	Before split dose	After split dose	*P* value
Polyp detection rate total (%)	44.1	49.5	< .001
Men	52.0	53.4	.5
Women	36.1	45.6	< .001
Adenoma detection rate total (%)	26.7	31.8	< .001
Men	33	36	.15
Women	20	28	< .001

I studio che ha dimostrato un vantaggio della detection di adenomi con preparazione split

Gurudu et al GIE 2012

Residual Risk After Colonoscopy: Right vs Left Colon



a. Brenner H, et al. *Gut*. 2011 Dec 26. [Epub ahead of print]; b. Singh G, et al. *Gastrointest Endosc*. 2007;65:AB100; c.Singh H, et al. *Gastroenterology*. 2010;139:1128-1137; d. Baxter NN, et al. *Ann Intern Med*. 2009;150:1-8.

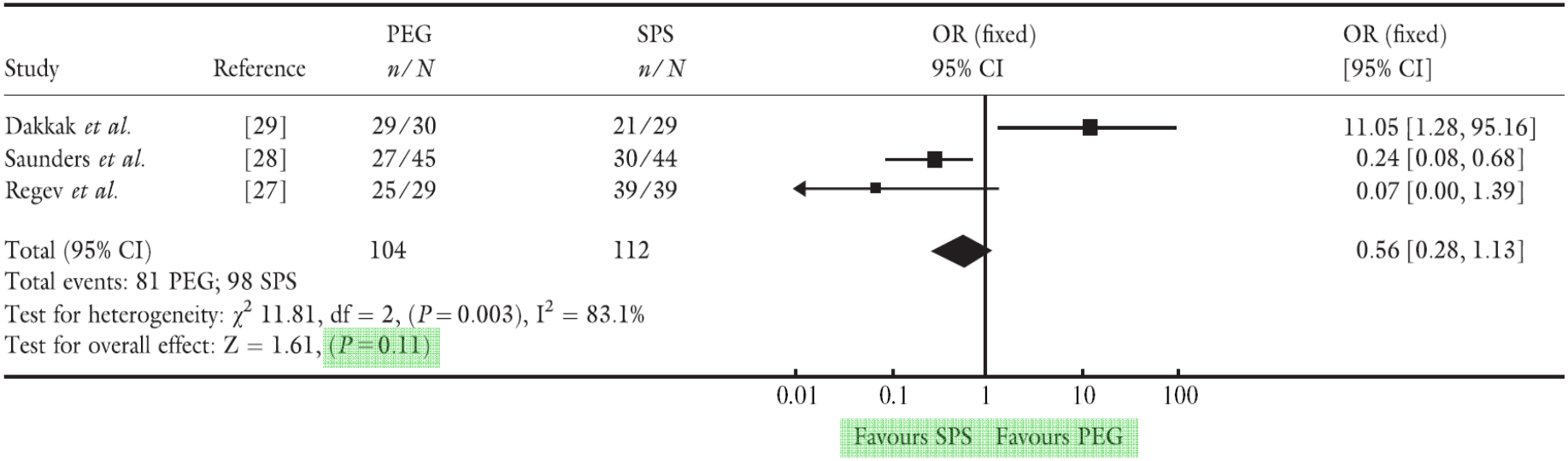
Proprietà chimico-fisiche e assorbimento sistemico

		SOLUZIONI DI NaP	SOLUZIONI DI PEG	SIGNIFICATIVITA'
Parametro	**Concentrazione**	**Media±ES**	**Media±ES**	
FOSFATI	mg/dl	↑↑↑ 0.95±0.53	-0.15±0.24	P<0.001
CALCIO	mg/dl	↓↓↓ -0.83±0.37	0.05±0.29	P<0.001
MAGNESIO	mg/dl	-0.565±0.27	0.09±0.24	P<0.001
SODIO	mm/L	↑↑ 4.1±0.1	2.2±4.05	P<0.038
POTASSIO	mmol/L	↓↓ -0.6±0.45	-0.2±0.16	P<0.01
Osmolalità tot.	mosm/dl	6.95±4.7	0.05±2.25	P<0.001

Nefropatia acuta da fosfato: precipitazione di cristalli di fosfati di Ca^{++} nei tubuli renali

Confronto efficacia PEG Vs NaP Vs SPS METANALISI

PEG Vs SPS (raggiungimento cieco)



Tan et al Colorectal Disease 2006

LINEE DI INDIRIZZO PER LA PROMOZIONE DELLA QUALITA' NEL II LIVELLO DIAGNOSTICO-TERAPEUTICO DEL PROGRAMMA DI SCREENING DEI TUMORI DEL COLON RETTO IN REGIONE EMILIA-ROMAGNA.

Indicatori di qualità della colonscopia

1. completezza grezza: N. esami fino al ceco/N. totale esami = >80%
2. preparazione intestinale insufficiente: n.ro esami inadeguati / n.ro esami <10%
3. intolleranza: n.ro es interrotti per intoller/n.ro totale esami <5%
4. interruzione per altri motivi (da specificare) n.ro es interrotti/n.ro tot esami <5%
5. presenza di consenso informato 100%
6. referto adeguato 100%
7. segnalazione delle complicanze (perforazione, emorragia, complicanze della sedazione)

Secondo quanto indicato dalle Società Scientifiche il tempo necessario per la esecuzione di una colonscopia comprensiva della fase operativa è di 60 min

Al termine dell'esame i pazienti riceveranno il referto con l'eventuale indicazione per il ritiro dell' esame istologico.

La Preparazione Intestinale
Le linee-guida

CONSENSUS DOCUMENT

Preamble

Gastrointest Endosc 2006

The following "Consensus Document on Bowel Preparation for Colonoscopy" is the culmination of an exceptional cooperative effort by 3 leading gastrointestinal societies. For over a year, a tripartite task force with representation from the American Society for Gastrointestinal Endoscopy, the American Society of Colon and Rectal Surgeons, and the Society of American Gastrointestinal and Endoscopic Surgeons has worked diligently to prepare this state of the art review. The comprehensive document is evidence based and a valuable resource for all physicians who perform colonoscopy. In addition to a critical scientific review of existent data, the document provides practical information on the manufacturers and pricing of available products used in bowel preparation. The governing bodies of all 3 organizations have reviewed and approved this document, which is to be published contemporaneously by the respective journals of each society. All who worked on this project should be congratulated for this practical contribution that will enhance the quality patient care that the members of all 3 societies provide on a daily basis.

Robert H. Hawes
President
American Society for Gastrointestinal Endoscopy (ASGE)
Ann Lowry
President
American Society of Colon and Rectal Surgeons
Dan Deziel
President
Society of American Gastrointestinal and Endoscopic Surgeons

0016-5107/$32.00
doi:10.1016/j.gie.2006.03.919

A consensus document on bowel preparation before colonoscopy: Prepared by a Task Force From The American Society of Colon and Rectal Surgeons (ASCRS), the American Society for Gastrointestinal Endoscopy (ASGE), and the Society of American Gastrointestinal and Endoscopic Surgeons (SAGES)

La Preparazione Intestinale
Le linee-guida

Communication from the ASGE Technology Committee

TECHNOLOGY STATUS EVALUATION REPORT

Colonoscopy preparation

Gastrointest Endosc 2009

The American Society for Gastrointestinal Endoscopy (ASGE) Technology Committee provides reviews of existing, new, or emerging endoscopic technologies that have an impact on the practice of GI endoscopy. Evidence-based methods are used with a MEDLINE literature search to identify pertinent clinical studies on the topic and a MAUDE (Food and Drug Administration Center for Devices and Radiological Health) database search to identify the reported complications of a given technology. Both searches were supplemented by accessing the "related articles" feature of PubMed and by scrutinizing pertinent references cited by the identified studies. Controlled clinical trials are emphasized, but, in many cases, data from randomized controlled trials are lacking. In such cases, large case series, preliminary clinical studies, and expert opinions are used. Technical data are gathered from traditional and Web-based publications, proprietary publications, and informal communications with pertinent vendors.

BACKGROUND

Colonoscopy and other methods of colonic imaging require thorough large-bowel cleansing for safe and effective completion of the procedure. For colonoscopy, inadequate preparation is responsible for up to a third of all incomplete procedures[1] and precludes up to 10% of examinations.[2] This outcome negatively impacts the rate of polyp[3,4] and adenoma detection.[5] The ideal colon preparation would rapidly and reliably clean the colon of fecal material while having no effect on the gross or microscopic appearance of the colon.[6,7] It would require a short period for ingestion and evacuation, cause no discomfort, and produce no significant fluid or electrolyte shifts.[8] At the same time, it would be palatable, simple, and inexpensive. Currently, the available preparation regimens fulfill some but not all of these criteria.

TECHNOLOGY UNDER REVIEW

Communication from the ASGE Technology Committee

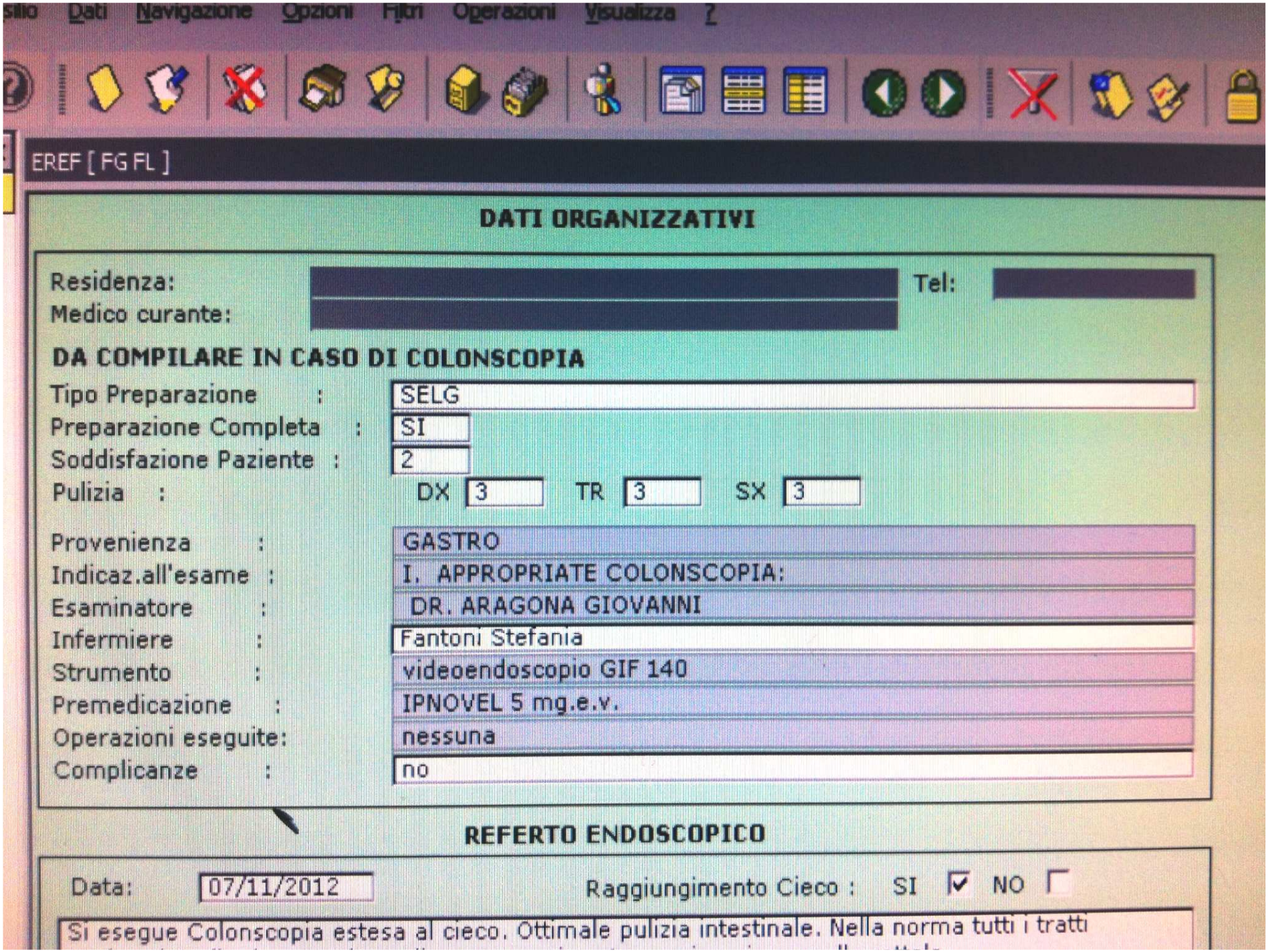
TECHNOLOGY STATUS EVALUATION REPORT

Colonoscopy preparation

Gastroint Endosc 2009

Product (manufacturer)	Active agent	FDA approved for bowel preparation: Children	FDA approved for bowel preparation: Adults	Quantity	Average wholesale price ($)
Isosmotic					
Full volume					
Colyte (SchwarzPharm, Mequon, Wis)	PEG	No	Yes		
Flavored				4000 mL	25.63
Nonflavored				4000 mL	24.44
GoLYTELY (Braintree, Braintree, Mass)	PEG	No	Yes		
Flavored				4000 mL	19.70
Nonflavored				4000 mL	18.45
NuLYTELY (Braintree)	PEG (sulfate free)	>6 mo	Yes		
Flavored				4000 mL	26.89
Nonflavored				4000 mL	26.89
TriLyte (SchwarzPharm)	PEG (sulfate free)	>6 mo	Yes		
Flavored				4000 mL	26.86
Low volume					
Halflytely (Braintree)	PEG and bisacodyl	No	Yes	2000 mL	52.31
MoviPrep (Salix Pharmaceuticals, Inc, Morrisville, NC)	PEG and ascorbic acid	No	Yes	2000 mL	46.80
Not approved for bowel preparation†					
MiraLax (Braintree)	PEG-3350 no electrolytes	No	No	255 g	21.73
GlycoLax (Kremers Urban Co, Wilmington, Del)	PEG-3350 no electrolytes	No	No	255 g	19.54

?


Dati Navigazione Opzioni Filtri Operazioni Visualizza ?
EREF [FG FL]
DATI ORGANIZZATIVI
Residenza:
Tel:
Medico curante:
DA COMPILARE IN CASO DI COLONSCOPIA
Tipo Preparazione : SELG
Preparazione Completa : SI
Soddisfazione Paziente : 2
Pulizia : DX 3 TR 3 SX 3
Provenienza : GASTRO
Indicaz.all'esame : I. APPROPRIATE COLONSCOPIA:
Esaminatore : DR. ARAGONA GIOVANNI
Infermiere : Fantoni Stefania
Strumento : videoendoscopio GIF 140
Premedicazione : IPNOVEL 5 mg.e.v.
Operazioni eseguite: nessuna
Complicanze : no
REFERTO ENDOSCOPICO
Data: 07/11/2012
Raggiungimento Cieco : SI NO
Si esegue Colonscopia estesa al cieco. Ottimale pulizia intestinale. Nella norma tutti i tratti

Aronchick Scale

0=EXCELLENT

1=GOOD

2=FAIR

3=POOR

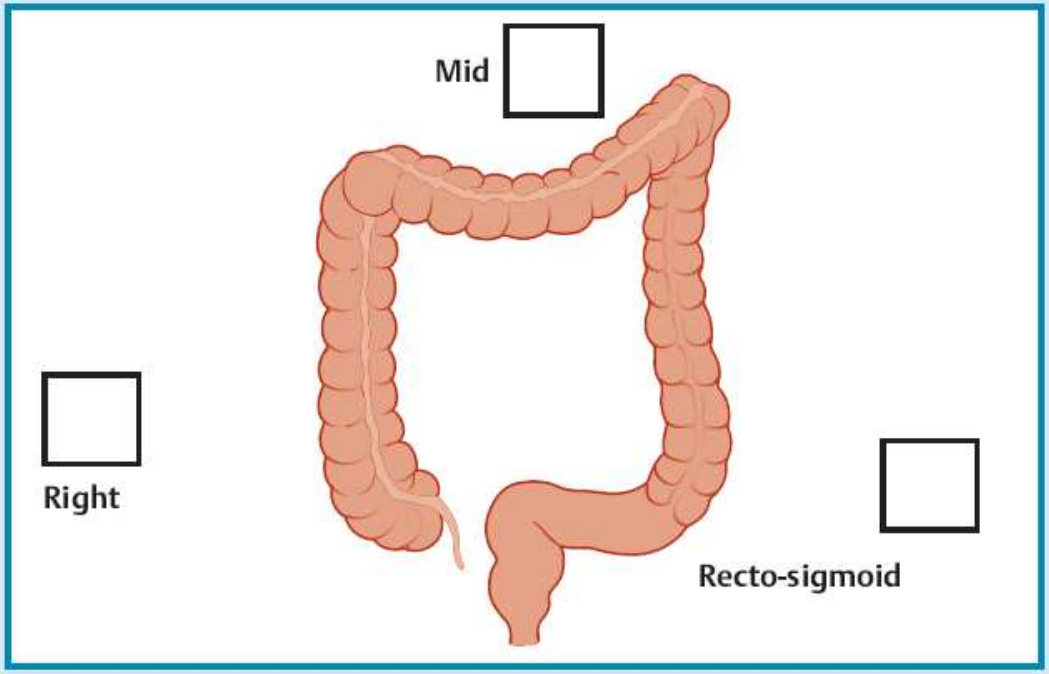
4=UNSATISFACTORY

Aronchick et al Gastroint Endosc 2000

Ottawa Bowel Preparation Score

A regional score per segment (Zero to four):

0 = perfect prep (excellent)
1 = mild staining but mucosa seen (good)
2 = suction needed to see colonic wall (fair)
3 = wash & suction needed (poor)
4 = unable to see colonic wall (very poor)



A general fluid score (Zero to two):

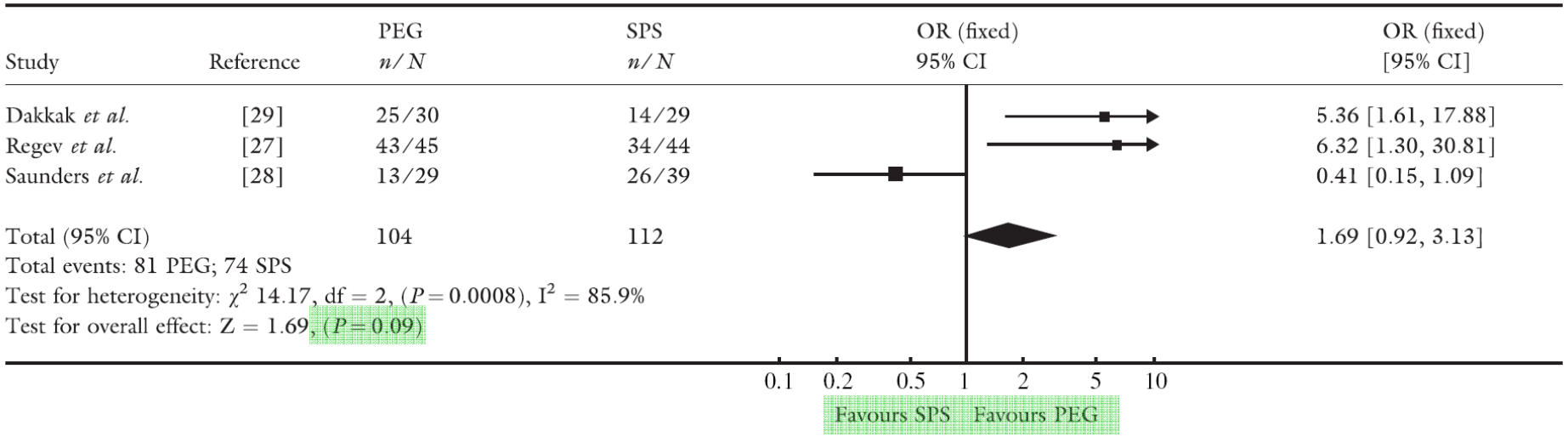
0 = No fluid
1 = Moderate volume
2 = Large volume

Rostom et al GIE 2004

Punteggio totale 0-14

Confronto efficacia PEG Vs NaP Vs SPS METANALISI

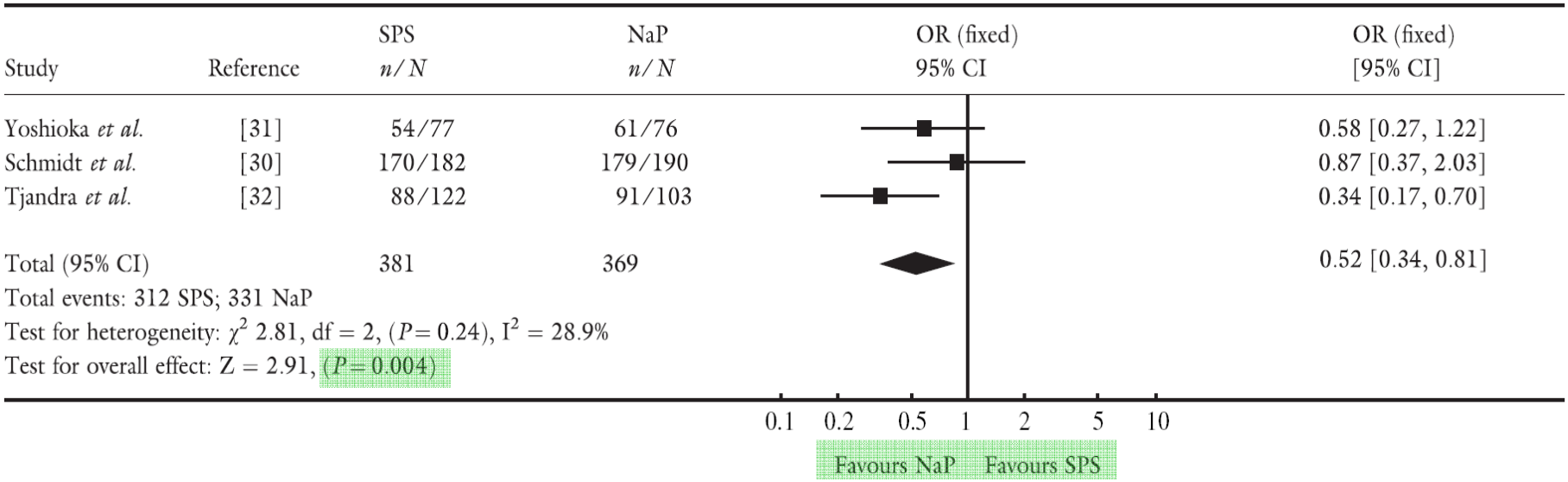
Peg Vs SPS (pulizia)



Tan et al Colorectal Disease 2006

Confronto efficacia PEG Vs NaP Vs SPS
METANALISI

NaP Vs SPS (pulizia)



Tan et al Colorectal Disease 2006

Validated Bowel Preparation Scales

Study	Excellent	Good	Fair	Poor
Aronchick[a]	% mucosal surface seen, amount liquid/solid stool present (global assessment)			
	> 95%	> 90%	> 90%	< 90%
Ottawa[b] **(0-14)**	Right, transverse, and rectosigmoid scored 0-4, 0-2 for quantity of residual fluid and totaled (0 = best)			
	0			14
Boston (BBPS)[c] **(9-0)**	Right, transverse, and left colon are scored 0-3 and totaled (9 = best)			
	7-9			0

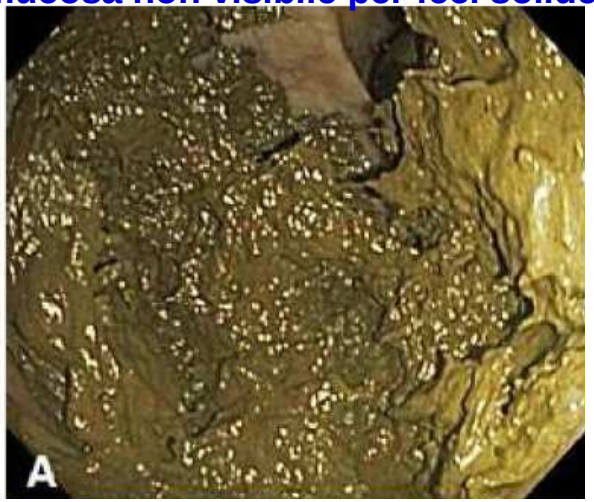
a) **Aronchick et al** Gastrointest Endosc 2000

b) **Rostom et al** Gastrointest Endosc 2004

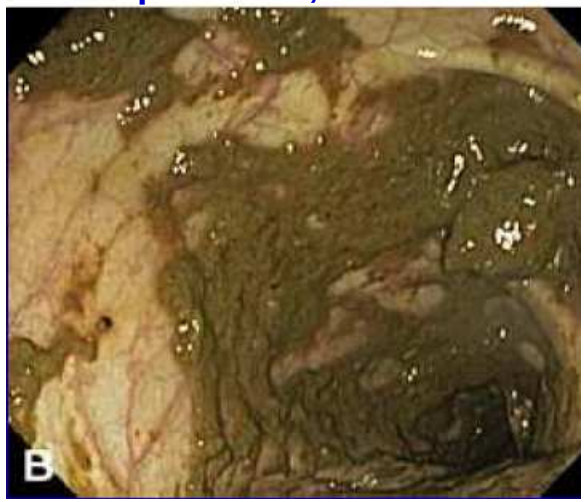
c) **Lai et al** Gastrointest Endosc 2009

Boston Preparation Scale "bee-bops"

Score 0
(mucosa non visibile per feci solide)



Score 1
(mucosa ipovisibile, feci semisolide)



Score 2
(mucosa visibile, feci rimovibili)

Score 3
(mucosa visibile, liquido chiaro)

- Dopo manovre di lavaggio, in uscita
- Per colon dx, trasverso, colon sx
- Score 0-9

Lai et al GIE 2009

ORIGINAL ARTICLE: Clinical Endoscopy

The Boston bowel preparation scale: a valid and reliable instrument for colonoscopy-oriented research

Edwin J. Lai, MD, Audrey H. Calderwood, MD, Gheorghe Doros, PhD, Oren K. Fix, MD, MSc, Brian C. Jacobson, MD, MPH, FASGE

Boston, Massachusetts, USA

TABLE 1. Reliability of the BBPS

	All clinicians	Attendings*	Fellows
Interobserver reliability			
No. participants	22	14	8
Intraclass correlation coefficient (95% predictive interval)	0.74 (0.67-0.80)	0.74 (0.65-0.85)	0.83 (0.77-0.91)
Intraobserver (test-retest) reliability			
No. participants†	21	13	8
Weighted kappa (95% CI)	0.77 (0.66-0.87)	0.76 (0.60-0.92)	0.85 (0.76-0.94)

*Includes 1 physician assistant with more than 10 years of experience performing flexible sigmoidoscopy.
†One physician was unable to view the DVD twice.

- Il giudizio va dato in uscita
- E' l'unico validato in studi di screening per CCR
- Ottawa e Aronchick validati, ma su pochi studi
- Lo score di pulizia andrebbe riportato sul referto

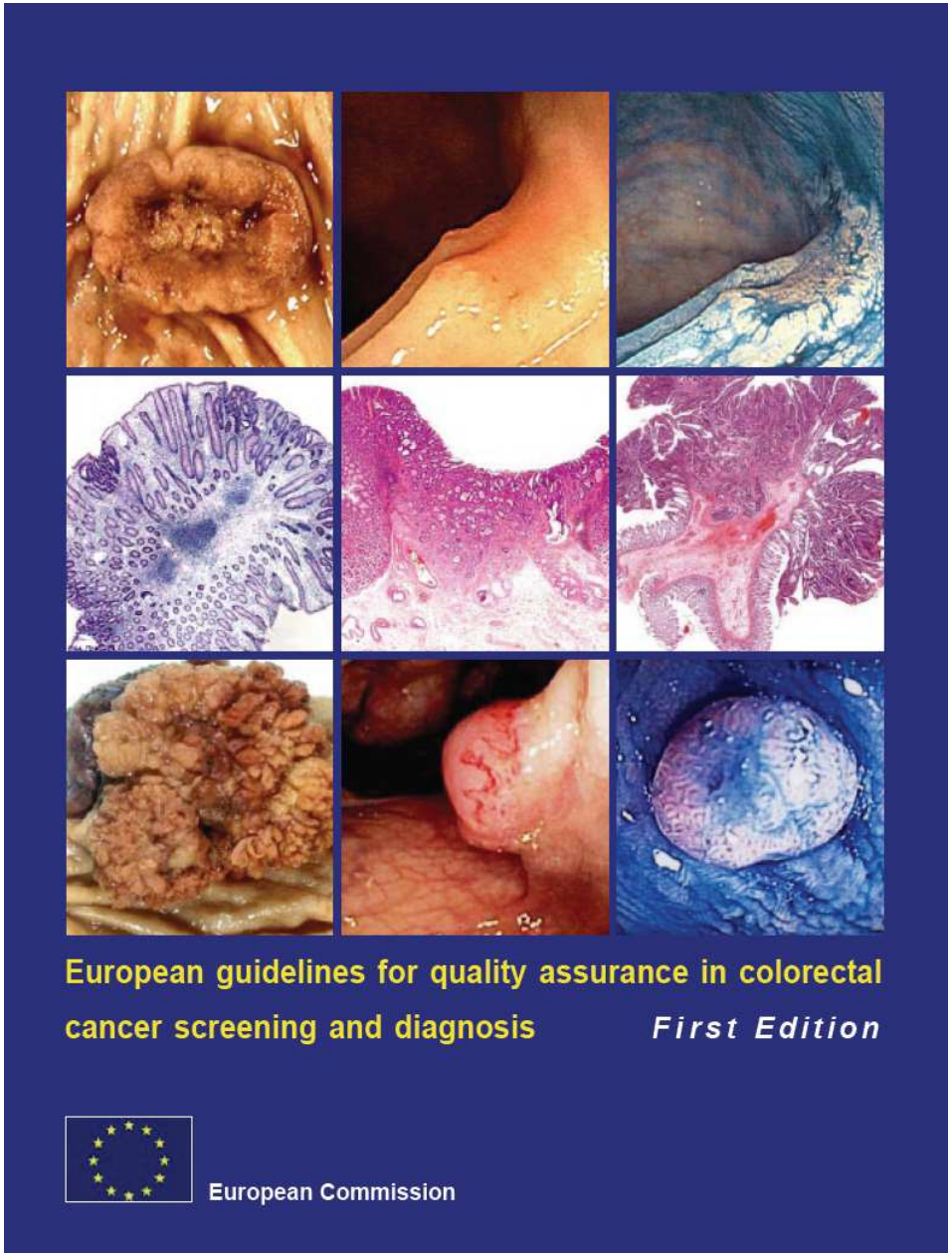
Lai et al GIE 2009

SPLIT-dosage
Quale è l'intervallo ottimale tra ultima dose e colonscopia ?

Multivariata sui fattori associati a ottima preparazione intestinale

	Odds ratio (95% CI)	*P* value
PC interval (3-5 h vs others*)	1.85 (1.18-2.86)	.007
≥75% of PEG ingested	4.34 (1.08-16.66)	.040
Compliance with preparation instructions	1.47 (0.75-2.86)	.265
Compliance with diet instructions	2.22 (1.33-3.70)	.002

Seo et al Gastroint Endosc 2012



1432 pagine

Pg 52-54

2.5.2 Endoscopy

2.5.2.1 Obtaining bowel preparation for endoscopy screening

The bowel preparation may be obtained from the office of the primary health care provider (e.g. GP), from endoscopy units or other screening facilities, or from pharmacists. There is no evidence concerning the impact of any of these strategies on participation rate, or on the proportion of inadequate exams. The aim should be to maximise accessibility taking into account local conditions, setting and culture. Several providers close to the target population should be available. The bowel preparation should be provided with clear and simple instruction sheets (see also Chapter 5).

Assunzione SPLIT con colonscopia al mattino
Rischio di aspirazione ?

Volume residuo gastrico

	Drinkers		*Starvers*
Number	44		44
M/F	24/20		24/20
Age (y) (mean (SD))	46·1 (14·4)	NS	48·5 (15·7)
Gastric volume (ml)	12·5 (0–81)		10 (0–72)
pH	2·0 (1·62–7·4)		2·0 (1·62–7·14)

- Drinkers: 500ml di acqua 90' prima della EGDS
- Starvers: a digiuno dalla mezzanotte del giorno prima

Greenfield et al GUT 1996

Assunzione SPLIT con colonscopia al mattino
Rischio di aspirazione ?

Volume residuo gastrico

NS

P<0.05

Residual gastric fluid volume (mL)	Split-dose bowel preparation (n = 254)	EGD only (n = 411)	Bowel preparation the evening before (n = 47)
Mean volume (± SD)	19.7 (± 19.1)	14.6 (± 16.6)*	20.2 (± 22.4)
Volume, range	0-129	0-140	0-98
Mean volume (± SD)			
PEG-3350 **(1,5L+1,5L)**	19.1 (± 18.0)	NA	23.6 (± 22.4)
PEG-ELS **(2L+2L)**	19.9 (± 21.2)	NA	16.4 (± 18.2)

Intervallo P-C ≅ 3h

Huffman et al *Gastroint Endosc 2010*

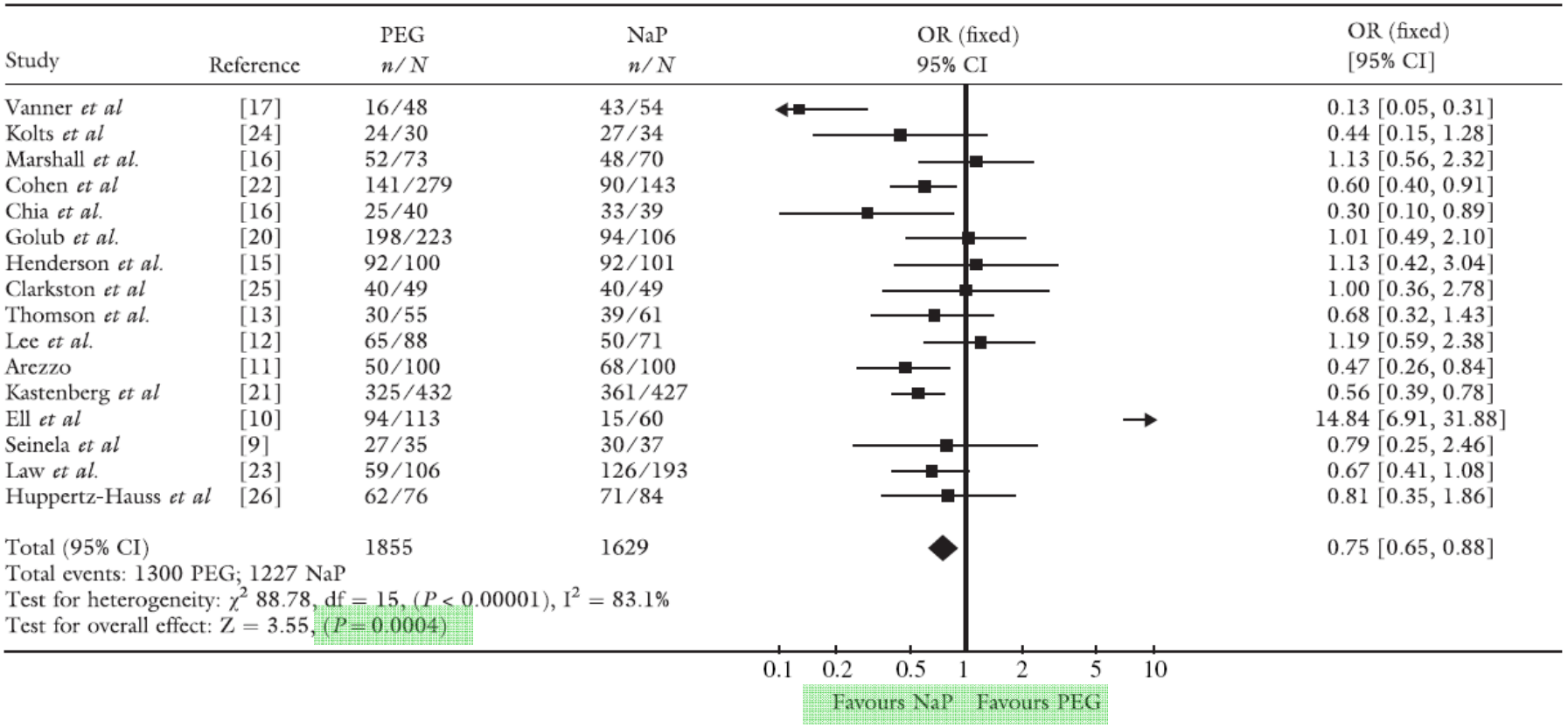
Confronto efficacia PEG Vs NaP METANALISI

Study	Reference	No. of patients	Preparation and dose used		
Arezzo	[11]	200	PEG 4 l	*vs*	NaP 80 ml
Chia *et al.*	[16]	79	PEG 4 l	*vs*	NaP 90 ml
Clarkston *et al.*	[25]	98	PEG 4 l	*vs*	NaP 90 ml
Cohen *et al.*	[22]	450	PEG 4 l	*vs*	NaP 90 ml
Ell *et al.*	[10]	185	PEG 3–4 l	*vs*	NaP 90 ml
Frommer	[18]	486	PEG 3 l	*vs*	NaP 90 ml
Golub *et al.*	[20]	329	PEG 4 l	*vs*	NaP 90 ml
Henderson *et al.*	[15]	242	PEG 4 l	*vs*	NaP 90 ml
Huppertz-Hauss *et al.*	[26]	231	PEG 4 l	*vs*	NaP 90 ml
Kastenberg *et al.*	[21]	845	PEG 4 l	*vs*	NaP Tabs 40 × 2 g
Kolts *et al.*	[24]	113	PEG 4 l	*vs*	NaP 90 ml
Kossi *et al.*	[19]	111	PEG 4 l	*vs*	NaP 90 ml
Law *et al.*	[23]	299	PEG 2–4 l	*vs*	NaP 90 ml
Lee *et al.*	[12]	209	PEG 4 l	*vs*	NaP 90 ml
Marshall *et al.*	[14]	143	PEG 4 l	*vs*	NaP 90 ml
Seinela *et al.*	[9]	72	PEG 4 l	*vs*	NaP 90 ml
Thomson *et al.*	[13]	116	PEG 4 l	*vs*	NaP 90 ml
Vanner *et al.*	[17]	102	PEG 4 l	*vs*	NaP 90 ml

Tan et al Colorectal Disease 2006

Confronto efficacia PEG Vs NaP Vs SPS
METANALISI

Peg Vs NaP (pulizia)



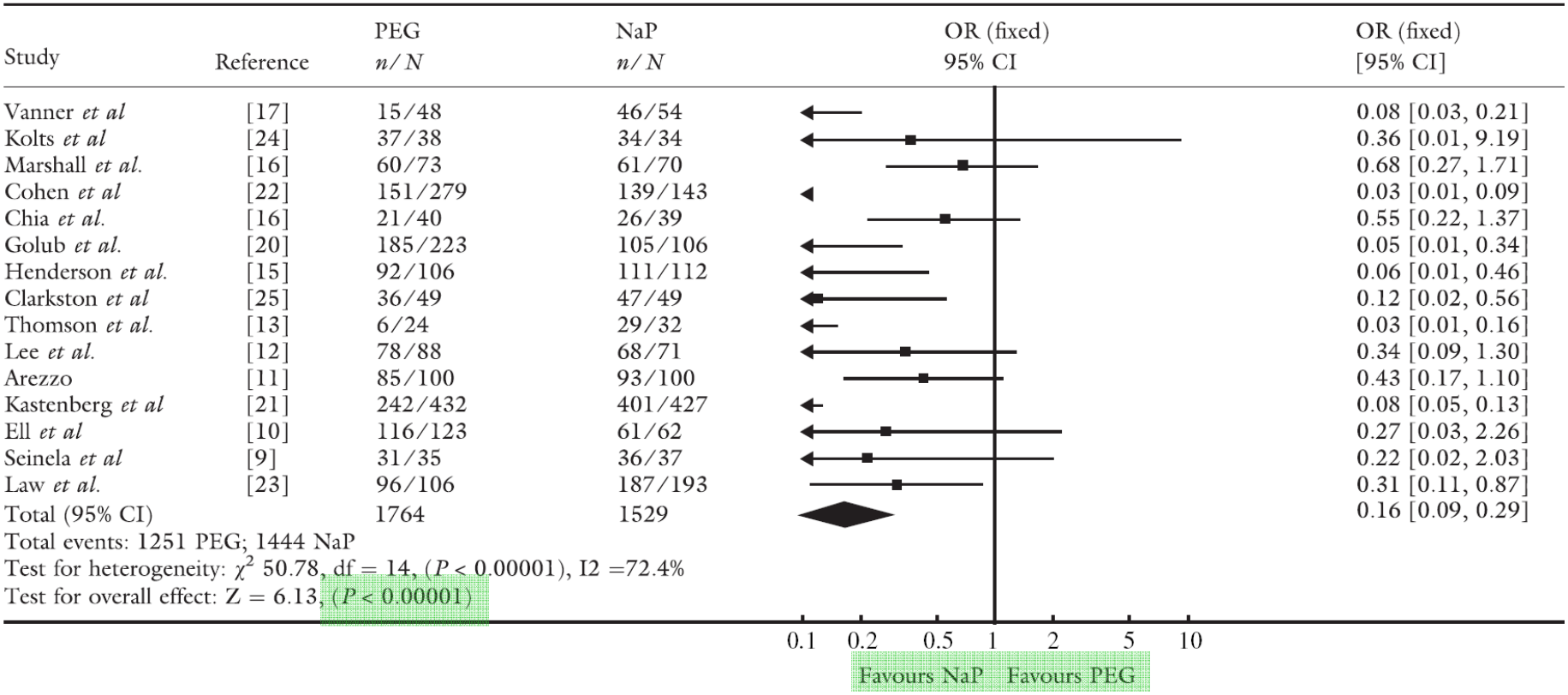
Study	Reference	PEG n/N	NaP n/N	OR (fixed) 95% CI
Vanner *et al*	[17]	16/48	43/54	0.13 [0.05, 0.31]
Kolts *et al*	[24]	24/30	27/34	0.44 [0.15, 1.28]
Marshall *et al.*	[16]	52/73	48/70	1.13 [0.56, 2.32]
Cohen *et al*	[22]	141/279	90/143	0.60 [0.40, 0.91]
Chia *et al.*	[16]	25/40	33/39	0.30 [0.10, 0.89]
Golub *et al.*	[20]	198/223	94/106	1.01 [0.49, 2.10]
Henderson *et al.*	[15]	92/100	92/101	1.13 [0.42, 3.04]
Clarkston *et al*	[25]	40/49	40/49	1.00 [0.36, 2.78]
Thomson *et al.*	[13]	30/55	39/61	0.68 [0.32, 1.43]
Lee *et al.*	[12]	65/88	50/71	1.19 [0.59, 2.38]
Arezzo	[11]	50/100	68/100	0.47 [0.26, 0.84]
Kastenberg *et al*	[21]	325/432	361/427	0.56 [0.39, 0.78]
Ell *et al*	[10]	94/113	15/60	14.84 [6.91, 31.88]
Seinela *et al*	[9]	27/35	30/37	0.79 [0.25, 2.46]
Law *et al.*	[23]	59/106	126/193	0.67 [0.41, 1.08]
Huppertz-Hauss *et al*	[26]	62/76	71/84	0.81 [0.35, 1.86]
Total (95% CI)		1855	1629	0.75 [0.65, 0.88]

Total events: 1300 PEG; 1227 NaP
Test for heterogeneity: χ^2 88.78, df = 15, ($P < 0.00001$), $I^2 = 83.1\%$
Test for overall effect: Z = 3.55, ($P = 0.0004$)

Tan et al Colorectal Disease 2006

Confronto efficacia PEG Vs NaP Vs SPS
METANALISI

PEG Vs NaP (raggiungimento cieco)



Study	Reference	PEG *n/N*	NaP *n/N*	OR (fixed) 95% CI	OR (fixed) [95% CI]
Vanner *et al*	[17]	15/48	46/54		0.08 [0.03, 0.21]
Kolts *et al*	[24]	37/38	34/34		0.36 [0.01, 9.19]
Marshall *et al.*	[16]	60/73	61/70		0.68 [0.27, 1.71]
Cohen *et al*	[22]	151/279	139/143		0.03 [0.01, 0.09]
Chia *et al.*	[16]	21/40	26/39		0.55 [0.22, 1.37]
Golub *et al.*	[20]	185/223	105/106		0.05 [0.01, 0.34]
Henderson *et al.*	[15]	92/106	111/112		0.06 [0.01, 0.46]
Clarkston *et al*	[25]	36/49	47/49		0.12 [0.02, 0.56]
Thomson *et al.*	[13]	6/24	29/32		0.03 [0.01, 0.16]
Lee *et al.*	[12]	78/88	68/71		0.34 [0.09, 1.30]
Arezzo	[11]	85/100	93/100		0.43 [0.17, 1.10]
Kastenberg *et al*	[21]	242/432	401/427		0.08 [0.05, 0.13]
Ell *et al*	[10]	116/123	61/62		0.27 [0.03, 2.26]
Seinela *et al*	[9]	31/35	36/37		0.22 [0.02, 2.03]
Law *et al.*	[23]	96/106	187/193		0.31 [0.11, 0.87]
Total (95% CI)		1764	1529		0.16 [0.09, 0.29]

Total events: 1251 PEG; 1444 NaP
Test for heterogeneity: χ^2 50.78, df = 14, ($P < 0.00001$), I2 =72.4%
Test for overall effect: Z = 6.13, ($P < 0.00001$)

Tan et al Colorectal Disease 2006

AP&T Alimentary Pharmacology and Therapeutics

Randomised clinical trial: low-volume bowel preparation for colonoscopy - a comparison between two different PEG-based formulations

(5 Centri Italiani)

A. Repici*, R. Cestari†, V. Annese‡, G. Biscaglia§, E. Vitetta*, L. Minelli†, G. Trallori‡, S. Orselli‡, A. Andriulli§ & C. Hassan*,¶

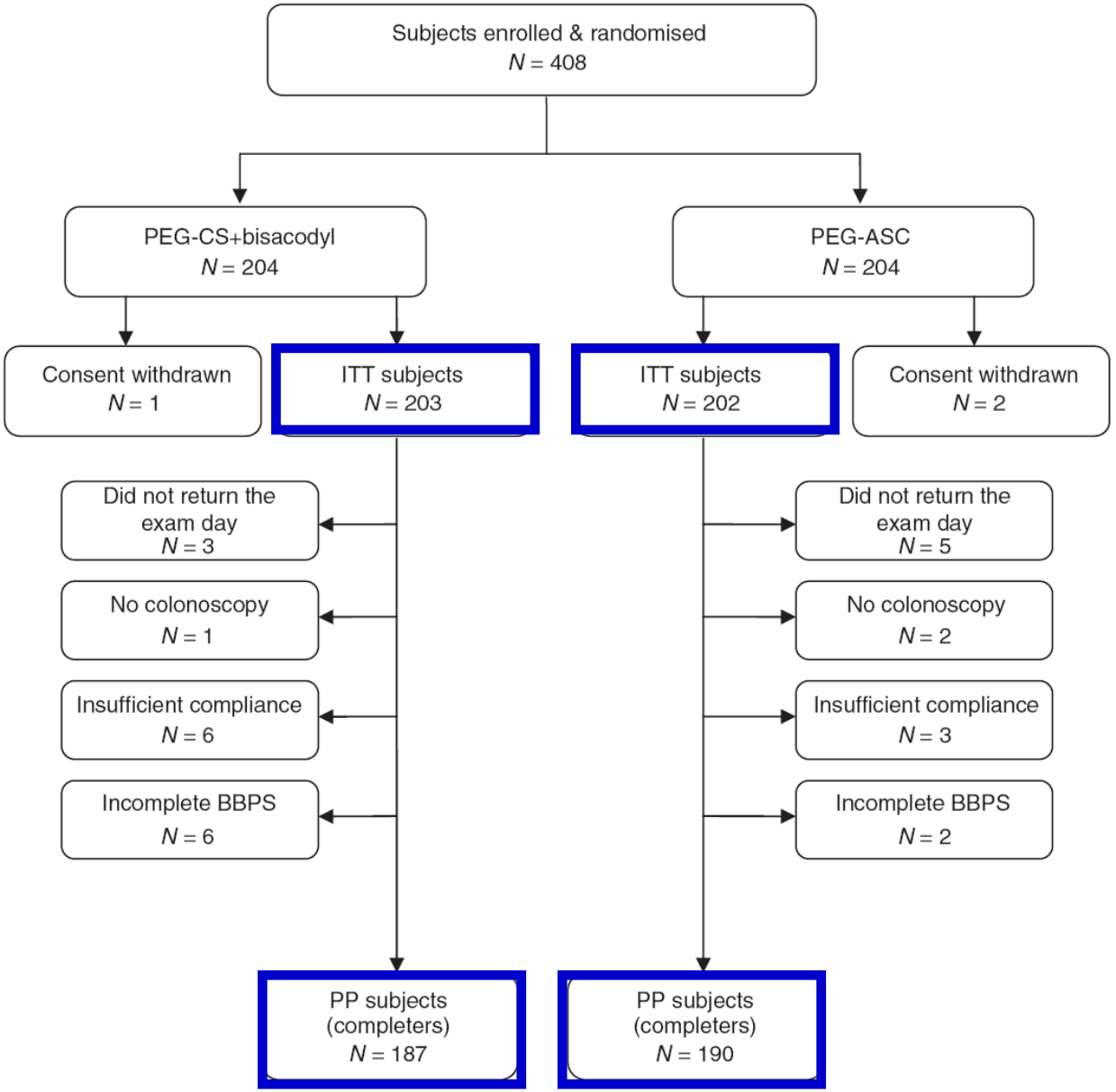
No splitting

	PEG-CS	PEG-ASC
Active ingredients	PEG, citrates, simethicone	PEG, ascorbates, sodium sulphate
Product description	4 sachets each containing 60.7 g of PEG 4000, 1.066 g of sodium citrate, 1.25 g of citric acid, 80 mg of simethicone	2 sachets each containing 100 g of PEG 3350 and 7.5 g of sodium sulphate 2 sachets each containing 4.7 g of ascorbic acid and 5.9 g of sodium ascorbate
Total volume	2-L	2-L
Electrolytes	Sodium chloride, potassium chloride	Sodium chloride, potassium chloride
Osmolality (mosmol/kg)	293	553
Mixed with	Water	Water
Diet prior to colonoscopy	Clear liquid after starting solution intake	Clear liquid after starting solution intake
Timing of ingestion	Full amount of solution at 20:00 hours the day prior to procedure	Full amount of solution at 19:00 hours the day prior to procedure*
Additional agents	2–4 bisacodyl tablets at 16:00 hours the day before starting solution intake	1-L of water after completing solution intake

PEG-CS, PEG-citrate-simethicone; PEG-ASC, PEG with ascorbic acid.

- Randomized
- Observer-blind

Repici et al APT 2012



Repici et al APT 2012

Risultati sulla pulizia (PP - ITT)

Variables	PEG-CS + bisacodyl	PEG-ASC	*P*-value
PP population	*N* = 187	*N* = 190	
Qualitative preparation rating, *N* (%)			
Excellent (BBPS: 8–9 pts)	85 (45.5%)	72 (37.9%)	
Good (BBPS: 6–7 pts)	63 (33.7%)	61 (32.1%)	
Poor (BBPS: 3–5 pts)	36 (19.3%)	51 (26.8%)	
Inadequate (BBPS: 0–2 pts)	3 (1.6%)	6 (3.2%)	
BBPS successful bowel cleansing (excellent & good), *N* (%)	148 (79.1%)	133 (70.0%)	0.042
Point estimate and 95% CI for the difference between successful rates	+9.1% (+0.4%, +17.9%)		
BBPS score per segment, mean ± s.d.			
Right colon	2.11 ± 0.78	1.95 ± 0.85	0.051
Transverse colon	2.39 ± 0.70	2.23 ± 0.77	0.031
Left colon	2.39 ± 0.75	2.28 ± 0.75	0.150
Optimum visibility degree, *N* (%)	106 (56.1%)	88 (46.3%)	0.044
ITT population	*N* = 203	*N* = 202	
BBPS successful bowel cleansing	155 (76.4%)	136 (67.3%)	0.043
Point estimate and 95% CI for the difference between successful rates	+9.0% (+0.3%, +17.7%)		
Optimum visibility degree, *N* (%)	110 (54.2%)	90 (44.6%)	0.052

Repici et al APT 2012

Risultati sulla tollerance (PP - ITT)

NS

Variables	PEG-CS+bisacodyl *N* = 203	PEG-ASC *N* = 202	*P*-value
Tolerability (ITT population)			
Presence of any of the following symptoms, *N* (%)	89 (43.8%)	91 (45.0%)	0.807
Nausea	60 (29.6%)	57 (28.2%)	0.766
Bloating	47 (23.2%)	43 (21.3%)	0.652
Abdominal pain	34 (16.7%)	30 (14.9%)	0.601
Anal irritation	19 (9.4%)	16 (7.9%)	0.606
Adverse events	3	5	
Acceptability (ITT Population)			
Ease of taking: no distress, *N* (%)	123 (60.6%)	133 (65.8%)	0.273
Willingness to repeat, *N* (%)	188 (92.6%)	189 (93.6%)	0.705
Compliance (ITT Population)			
Amount of solution intake $\geq$ 75%, *N* (%)	193 (95.1%)	192 (95.0%)	0.991

Repici et al APT 2012

Meta-analysis: the relative efficacy of oral bowel preparations for colonoscopy 1985–2010

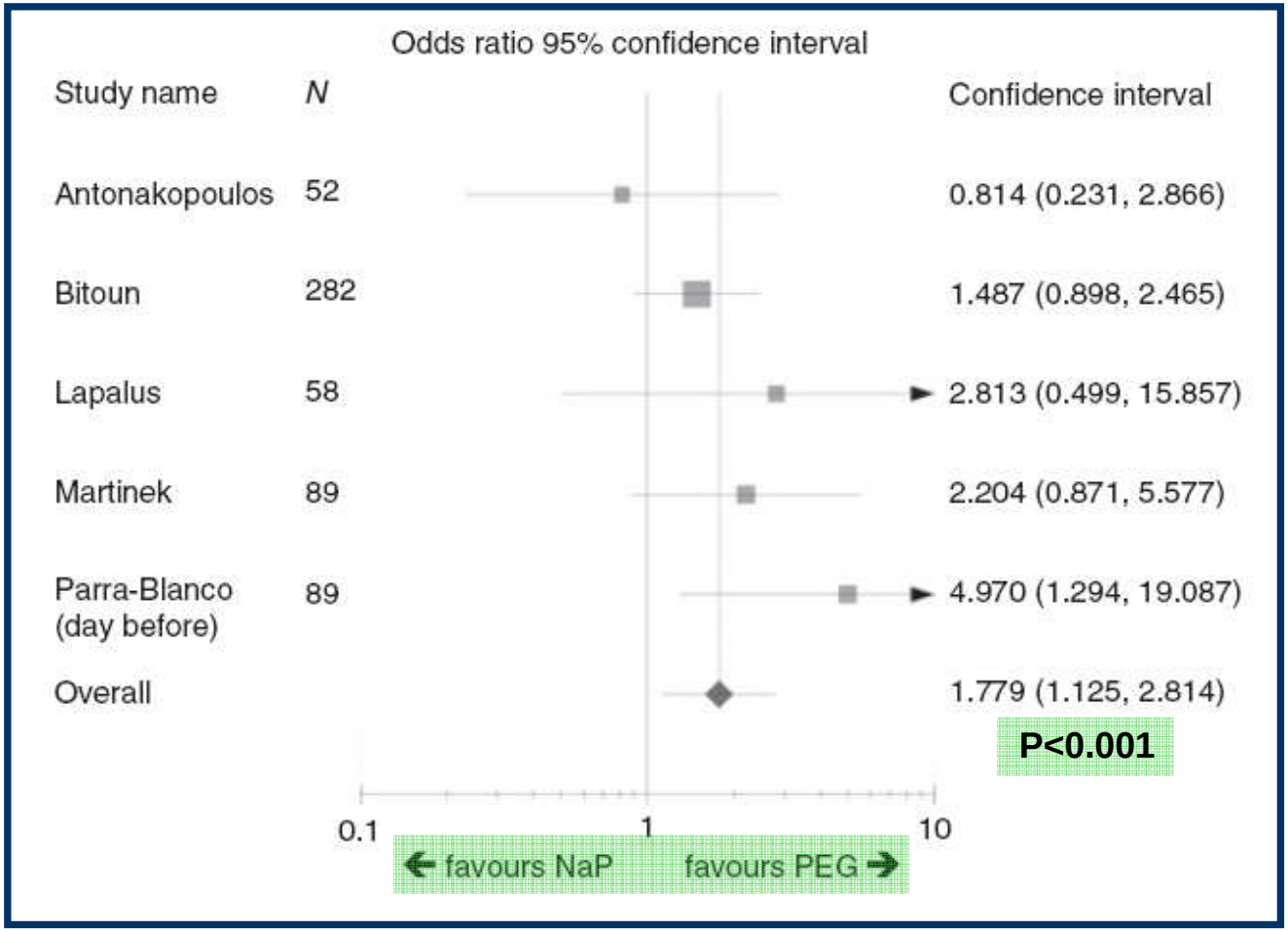
J. Belsey*, C. Crosta†, O. Epstein‡, W. Fischbach§, P. Layer¶, F. Parente** & M. Halphen††

Regimen	Trials (*n*)	References
PEG vs. NaP	31	[10–40]
PEG vs. PEG	29	[16, 41–68]
NaP vs. NaP	11	[69–79]
PEG vs. Others	12	[80–91]
NaP vs. Others	9	[92–100]
Other comparisons	13	[101–113]

PEG, polyethylene glycol; NaP, sodium phosphates.

Confronto efficacia PEG Vs NaP METANALISI

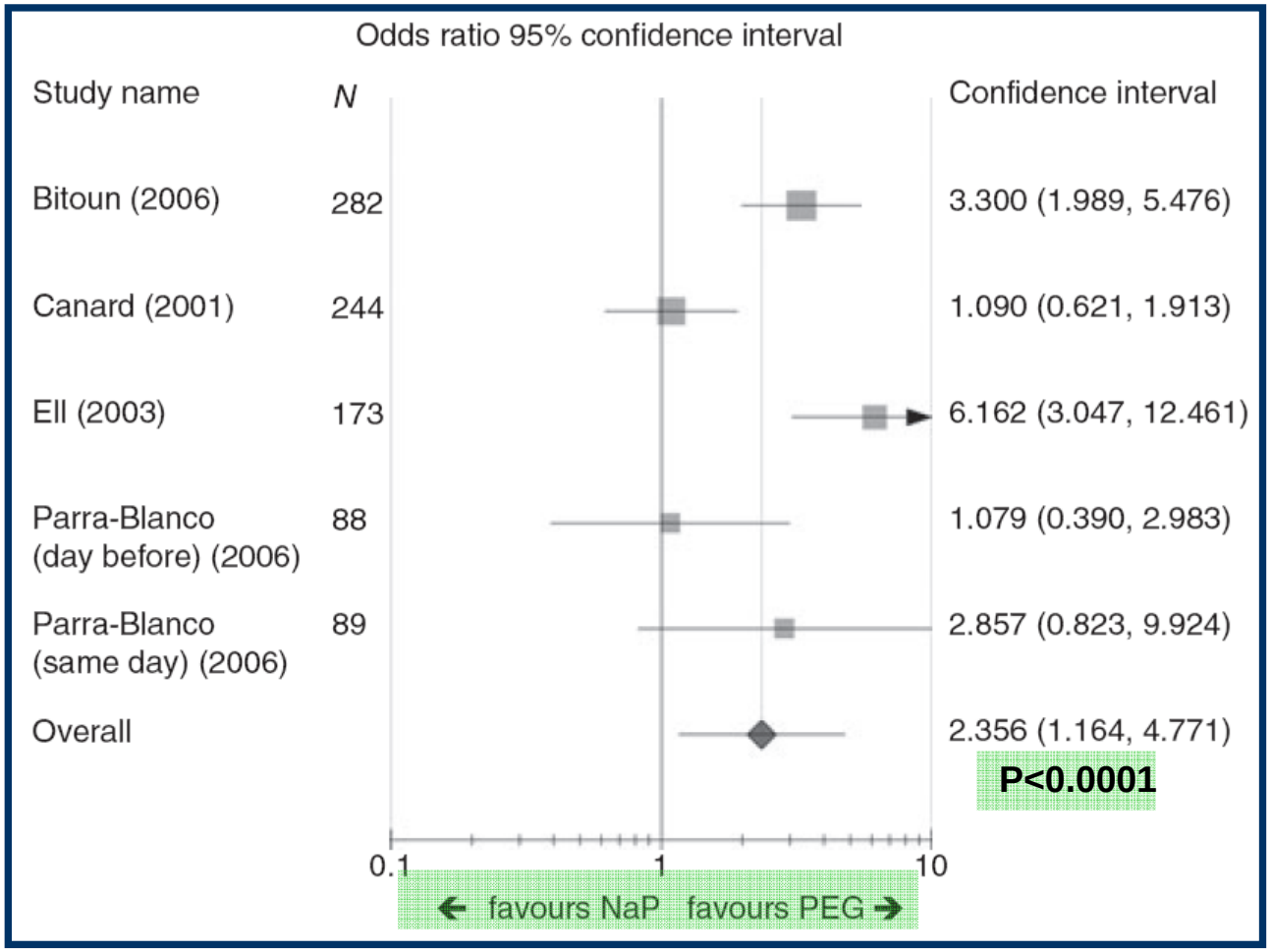
PEG Vs NaP (pulizia – no split)



Belsey et al Aliment Pharmacol Ther 2012

Confronto efficacia PEG Vs NaP METANALISI

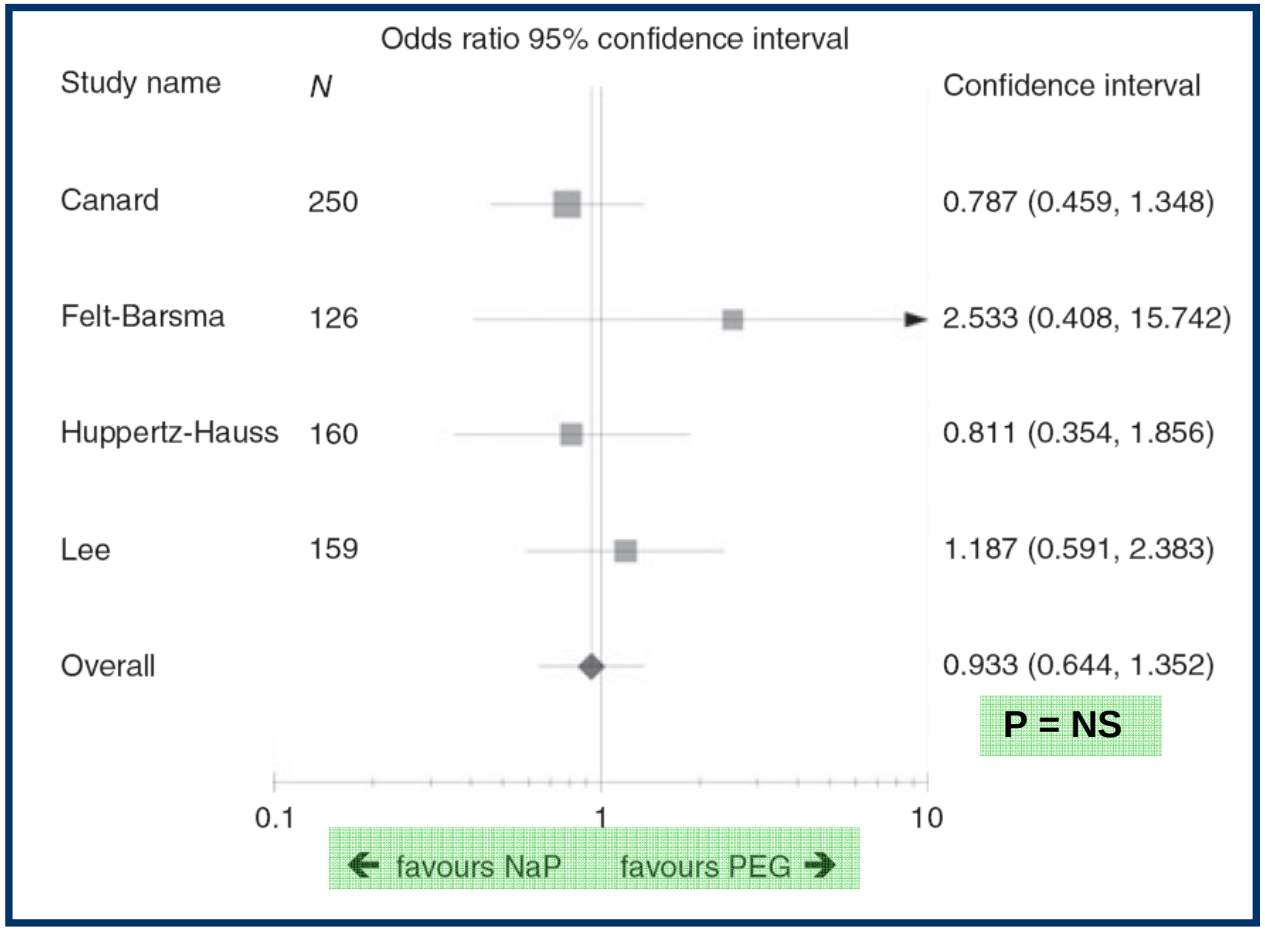
PEG Vs NaP (pulizia – no split) ASCENDENTE



Belsey et al Aliment Pharmacol Ther 2012

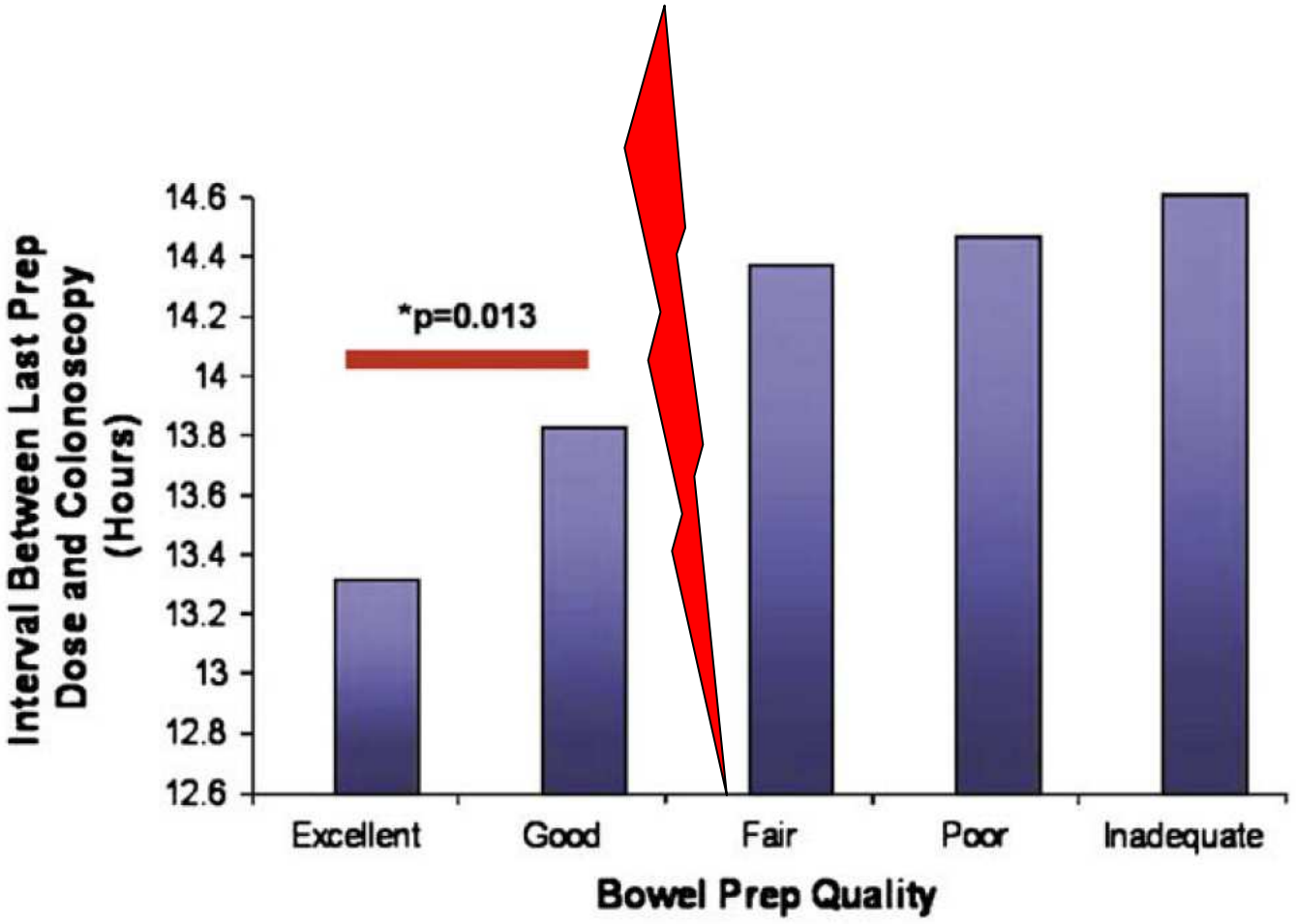
Confronto efficacia PEG Vs NaP METANALISI

PEG Vs NaP (pulizia - split)



Belsey et al Aliment Pharmacol Ther 2012

SPLIT-dosage
Quale è l'intervallo ottimale tra ultima dose e colonscopia ?



Siddiqui et al Gastroint Endosc 2009

Stimolanti e sostanze aggiunte

Product (manufacturer)	Active agent	FDA approved for bowel preparation: Children	FDA approved for bowel preparation: Adults	Quantity	Average wholesale price ($)
Fleet Bisacodyl (C.B. Fleet)	Bisacodyl	No	No		
5-mg tablet				25 Tablets	2.90
10-mg suppository				4 Suppositories	1.95
Dulcolax (Bisacodyl 5 mg; Boehringer, Petersburg, Va)	Bisacodyl	No	No	100 Tablets	8.30
Senna (8.6 mg; AmerisourceBergen)	Senna	No	No	100 Tablets	8.99
Senna syrup (8.8 mg per 5 mL; Altaire, Aquebogue, NY)	Senna	No	No	237 mL	7.92
Sennokot (8.6 mg; Purdue Products LP, Stamford, Conn)	Senna	No	No	20 Tablets	5.56
SennaPlus (50 mg; American Health Packaging, Columbus, Ohio)	Senna and docusate sodium	No	No	100 Tablets	11.13
Metoclopramide (5 mg; Teva, Philadelphia, Pa)	Metoclopramide	No	No	100 Tablets	33.25
Gas-X (80 mg; Novartis, East Hanover, NJ)	Simethicone	No	No	12 Tablets	1.88
				36 Tablets	4.67
Mylicon Infant Drops (40 mg per 0.6 mL; J & J/ Merck, Fort Washington, Pa)	Simethicone	No	No	15 mL	6.22
				30 mL	10.68
Simethicone (80 mg; Advance, Ronkonkoma, NY)	Simethicone	No	No	100 Tablets	2.99
Simethicone (125 mg; Rugby, Corona, Calif)	Simethicone			60 Tablets	5.02/ea
Mylanta (J & J/Merck)		No	No	150 mL	2.94