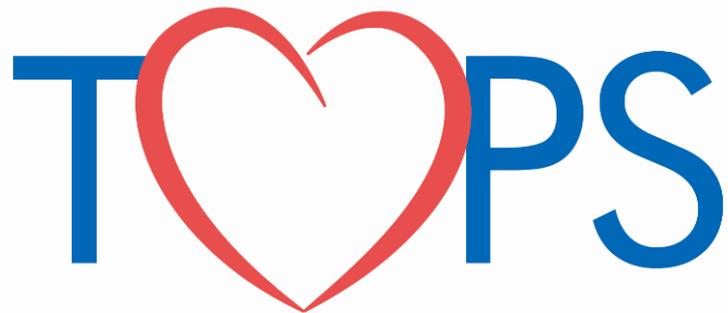


わが国の麻酔領域における ERAS[®]の普及および 効果に関する研究



TOBU HOSPITAL
PATIENT SUPPORT CENTER

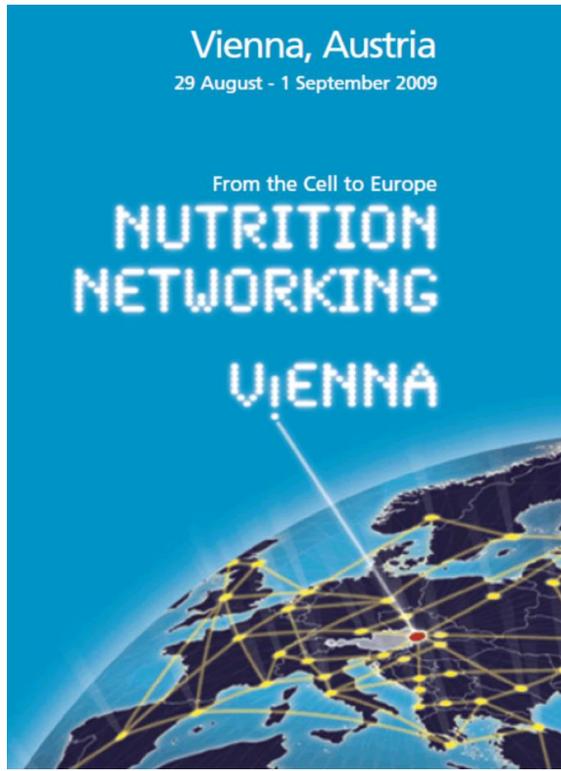
2018年11月1日
日本臨床麻酔学会 第38回大会
小坂二度見記念賞

Standing
for the
Patients

谷口英喜
恩賜財団 済生会横浜市東部病院
患者支援センター

ERAS[®] プロトコル

- 北欧において医療経済の破綻を防ぐために考案された周術期の集学的治療
- 2005年にFearonらにより、結腸直腸開腹手術における促進策としてERAS[®]（イーラス、enhanced recovery after surgery）プロトコルが公表された
- ERAS[®]プロトコルの導入により合併症の発症率減少、在院日数の短縮、医療コストの削減が報告された
- The European Society for Clinical Nutrition and Metabolism（ESPEN）にて議論される



Pro. Fearon on 8. Sep.2009 , Vienna

Last Updated: 14 November 2017

Past Congresses

2017	The Hague, Netherlands
2016	Copenhagen, Denmark
2015	Lisbon, Portugal
2014	Geneva, Switzerland
2013	Leipzig, Germany
2012	Barcelona, Spain
2011	XXXIII Gothenburg, Sweden
2010	XXXII Nice, France
2009	XXXI Vienna, Austria



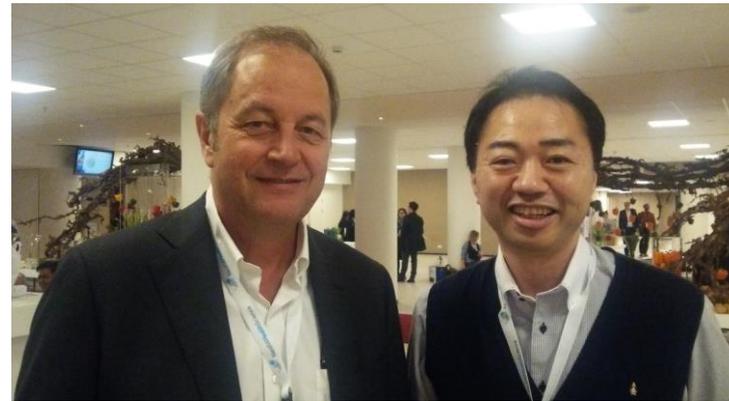
Pro.Fearonに肩をたたかれ
「日本の麻酔科医もここに入れているか？」
ERASをわが国の麻酔領域にも広げたいと思った瞬間

ASSOCIATED WEBSITES OF THE ERAS SOCIETY



2001

Ken Fearon and Olle Ljungqvist met in London at a nutrition symposia and decided to start a collaborative group on peri-operative care.



Olle Ljungqvist

「日本にも絶飲食ガイドラインを作れば良い」
わが国のガイドラインを作りたいと思った瞬間

Dear Dr Taniguchi

Thank you for your message and congratulations on your work with enhanced recovery. When we meet in Liverpool, we should discuss who we in the ERAS Society can work with you and your colleagues to bring you into the international ERAS Society group.

Best wishes

Olle Ljungqvist MD PhD

Professor of Surgery Faculty of Medicine and Health,
School of Health and Medical Sciences

Department of Surgery

Örebro University,

Örebro, Sweden

Postal address: Dept of Surgery Örebro University Hospital
SE-701 85 Örebro

Phone: +46 (0)19 602 1543

Fax: +46 (0)19 12 54 39

Emails: olle.ljungqvist@oru.se

olle.ljungqvist@ki.se

The image shows a promotional poster for the ERAS Society. At the top, it reads "ERAS® Society" with a logo. Below that, it says "7th ERAS World Congress" and "Joint with 9th ERAS UK Conference". There is a small logo for "Enhanced RECOVERY" and "ERAS Society UK Chapter". The background features a night cityscape of Liverpool. A red ribbon with the ERAS Society logo is draped across the top right. In the bottom right corner, there is a smaller inset image showing a building and the text "ERAS Society 7th ERAS World Congress ENHANCED RECOVERY AFTER SURGERY 1 - 3 May 2019 ACC LIVERPOOL LIVERPOOL, UK LIVERPOOL www.erasociety.org". At the bottom of the main poster, it says "SAVE THE DATE 1 - 3 May 2019 LIVERPOOL". Below that, it says "For more information Please contact the Congress Secretariat". At the very bottom, it says "7th ERAS World Congress | Liverpool, United Kingdom c/o MCI Suisse SA - Rue du Pre-Bouvier 9 - 1202 Satigny, Geneva - Switzerland Phone: +41 22 33 99 726 Fax: +41 22 33 631 Email: eras@mci-group.com".

術前絶飲食ガイドラインを作成するために

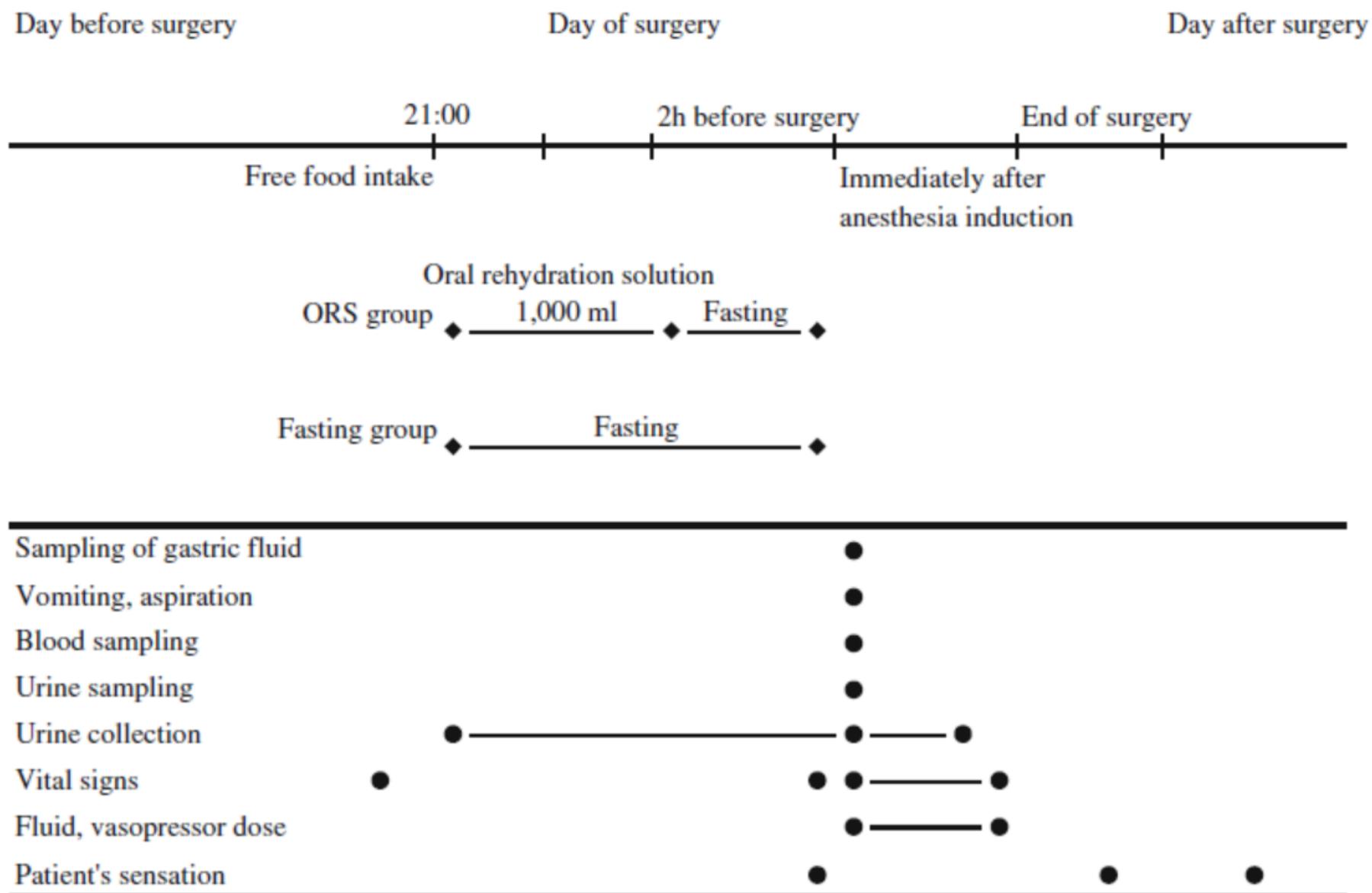
- はじめに、単施設研究（受賞対象の期間外）；平成22年 日本臨床麻酔学会誌賞
Preoperative fluid and electrolyte management with oral rehydration therapy.
Hideki Taniguchi , et al. J Anesth (2009) 23:222–229
- 続いて、多施設共同研究
受賞論文①
Safety and efficacy of oral rehydration therapy until 2h before surgery : a multicenter randomized controlled trail . Kenji Itou, Hideki Taniguchi , et al. J Anesth 26:20-27,2012

結論

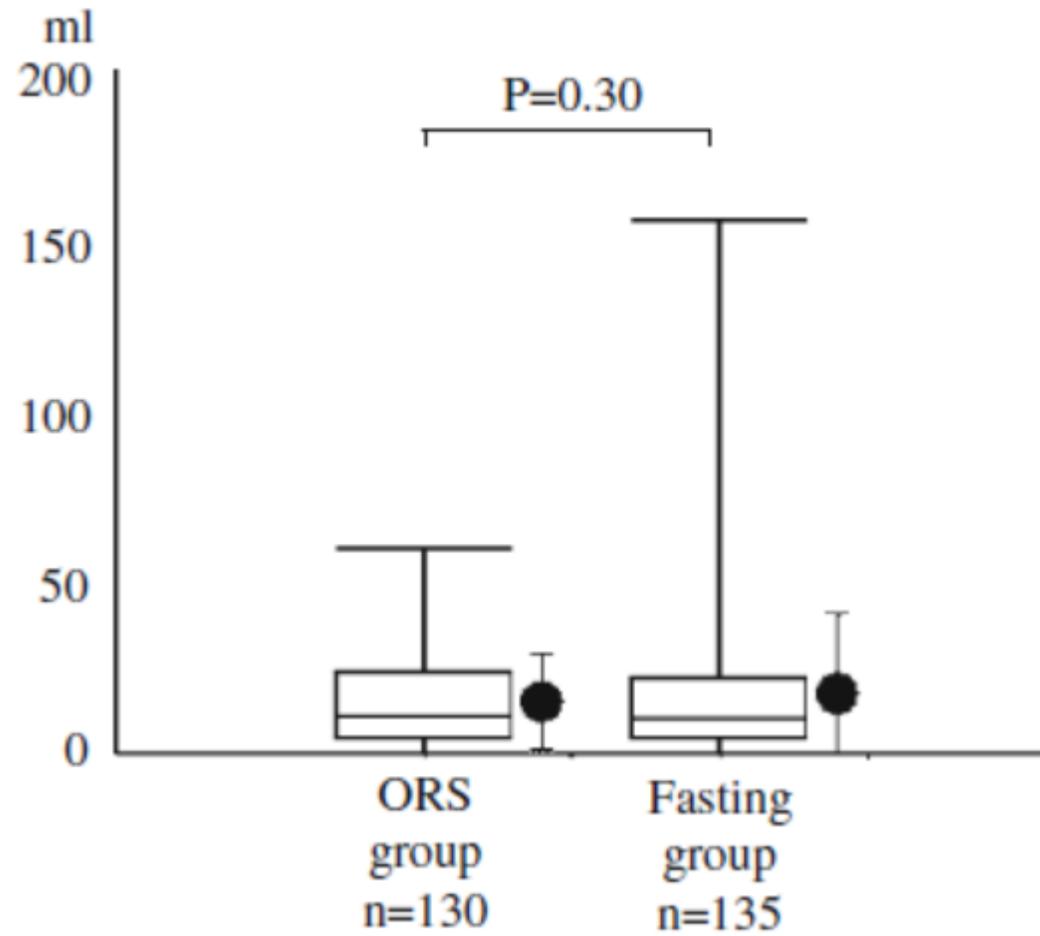
術前に経口補水液を2時間前まで摂取しても

- 胃液量が増加することはない
- 輸液療法と同等の水電解質補給効果がある
- 患者の満足度（口渇・空腹の軽減）は高い

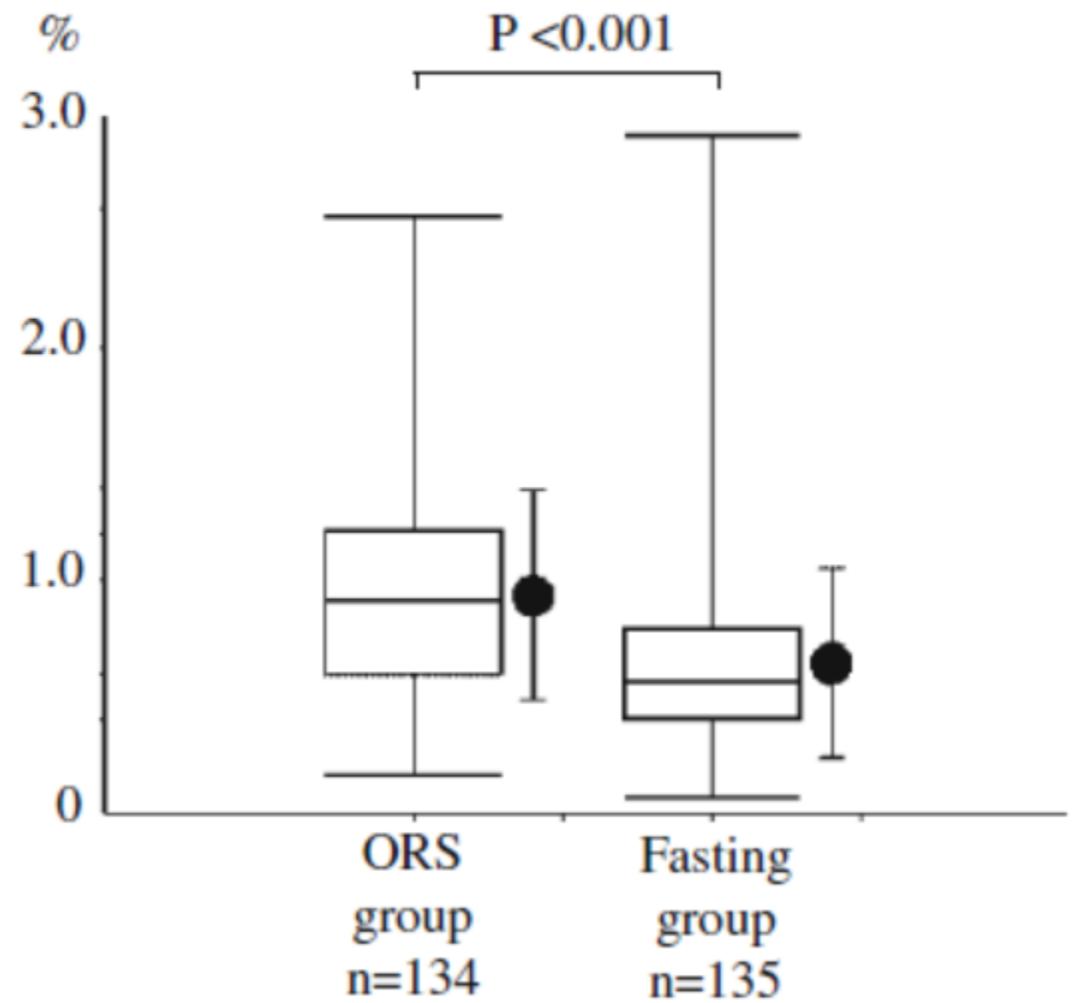
Fig. 1 Schedule of treatment and data collection in the study that tested the safety and efficacy of oral rehydration therapy until 2 h before surgery under general anesthesia. *ORS group*, oral rehydration solution group (OS-1; oral rehydration solution: Otsuka Pharmaceutical Factory, Tokushima, Japan)



Gastric fluid volume



FENa



公益社団法人日本麻酔科学会 術前絶飲食ガイドライン

1. はじめに

待機的全身麻酔下手術では，麻酔導入時の嘔吐および誤嚥の発現が危惧されるため，手術前は長時間の絶飲食が行われてきた．しかし，長時間の絶飲食は，患者に口渇感や空腹感などの苦痛を与え，脱水や周術期の合併症を増やす可能性があり，近年，多くの研究で短時間絶飲水の安全性と有効性が実証されてきた．欧米各国では術前絶飲食に関するガイドラインが作成され，術前絶飲食時間の短縮が推奨されてきた．昨今，本邦でも術前絶飲食時間を見直す動きが広まりつつある．我々は本邦における安全な術前絶飲食時間の短縮に寄与することを目的に本ガイドラインを作成した．

2012年7月

**清澄水の摂取は年齢を問わず
麻酔導入2時間前まで安全である
(推奨度A)**

日本麻酔科学会 術前絶飲食ガイドライン

http://www.anesth.or.jp/guide/pdf/guideline_zetsuinshoku.pdf

●2011年に発表された、ヨーロッパ麻酔科学会の周術期の飲食に関するガイドラインの中で著者らの論文が引用され、次の2点に取り上げられている。

- ・術前経口補水療法の安全性
- ・術前経口補水療法の有効性



GUIDELINES

Perioperative fasting in adults and children: guidelines from the European Society of Anaesthesiology

Ian Smith, Peter Kranke, Isabelle Murat, Andrew Smith, Geraldine O'Sullivan, Eldar Søreide, Claudia Spies and Bas in't Veld

European Journal of Anaesthesiology 2011, Vol 28 No 00

5.1. Carbohydrates versus clear liquids or intravenous infusion

Taniguchi *et al.*²⁸ investigated the safety and effectiveness of oral rehydration as compared with intravenous rehydration prior to general anaesthesia. Fifty patients were randomised to either 1000 ml of oral rehydration solution or 1000 ml of an intravenous electrolyte solution. Volume of gastric contents, as measured directly after induction, was significantly lower in the oral rehydration group.

Taniguchi *et al.*²⁸ investigated 50 patients randomised to either 1000 ml of oral rehydration solution or 1000 ml of an intravenous electrolyte solution. Patients' satisfaction favoured oral rehydration as they experienced less feelings of hunger, less occurrence of dry mouth and less restriction of movement. Similar subjective benefits were observed in a recent small study of gynaecological patients.⁴⁶

術前経口補水療法は
輸液療法と比べて

- ・水分・電解質補給効果が同等
- ・胃内への残留がなく、安全

術前経口補水療法は

- ・術前患者の空腹を和らげる
- ・口渇を和らげる
- ・輸液による拘束をなくす
非常に有益な手段である

術前、ERAS管理をして麻酔導入前の体液量評価

受賞論文③

Preoperative management of surgical patients by “shortened fasting time”: a study on the amount of total body water by multi-frequency impedance method .

Hideki Taniguchi , et al. Int J Med Sci. 2012; 9(7): 567–574.

結論

絶飲食期間の短縮、術前経口補水療法(PO-ORT)、緩下剤の軽減化を活用した ERAS programによる術前管理で入室時のTBW: total body water を維持できる

Day before surgery

Day of surgery

7:00

12:00

18:00

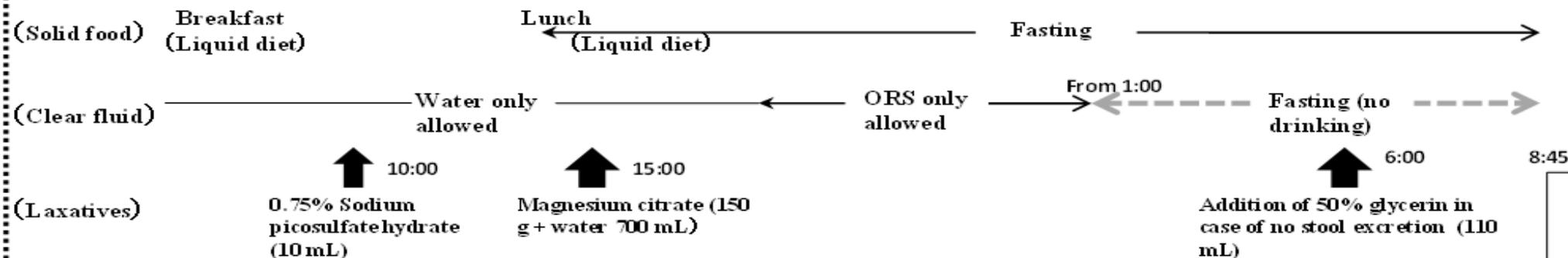
0:00

6:00

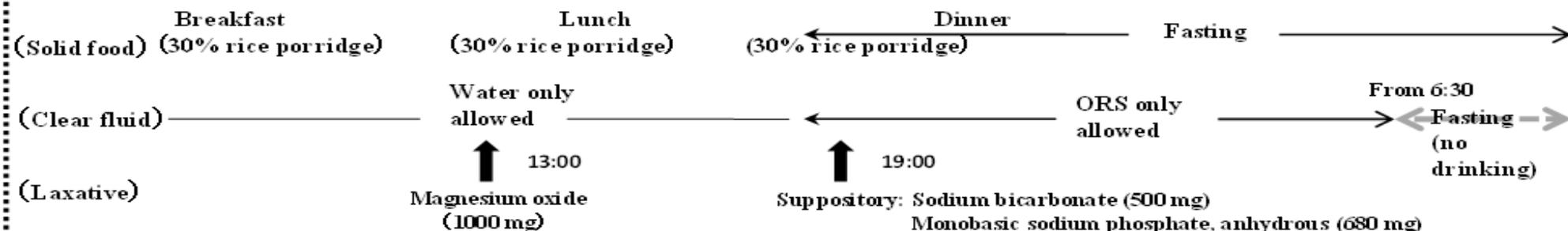
8:00

8:45

Control group

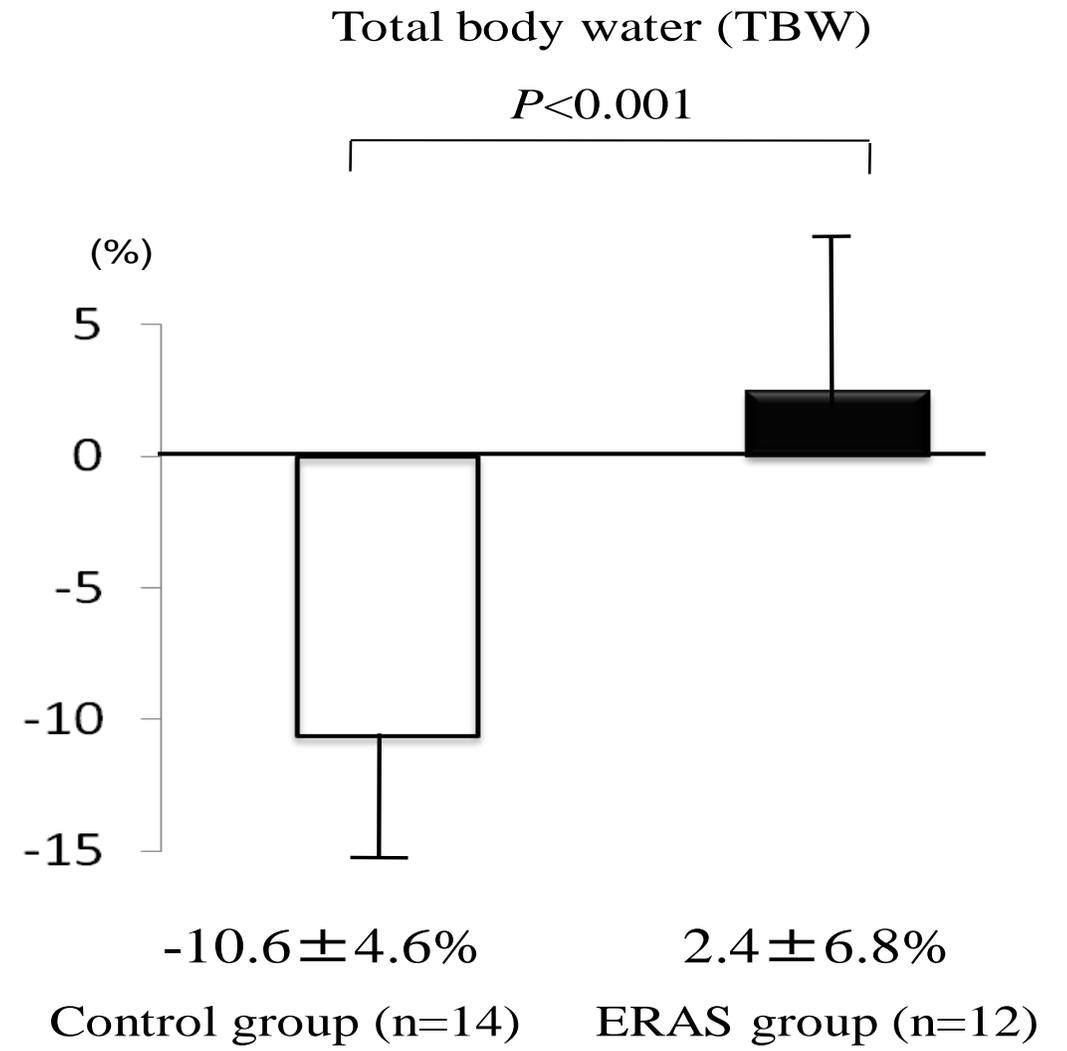
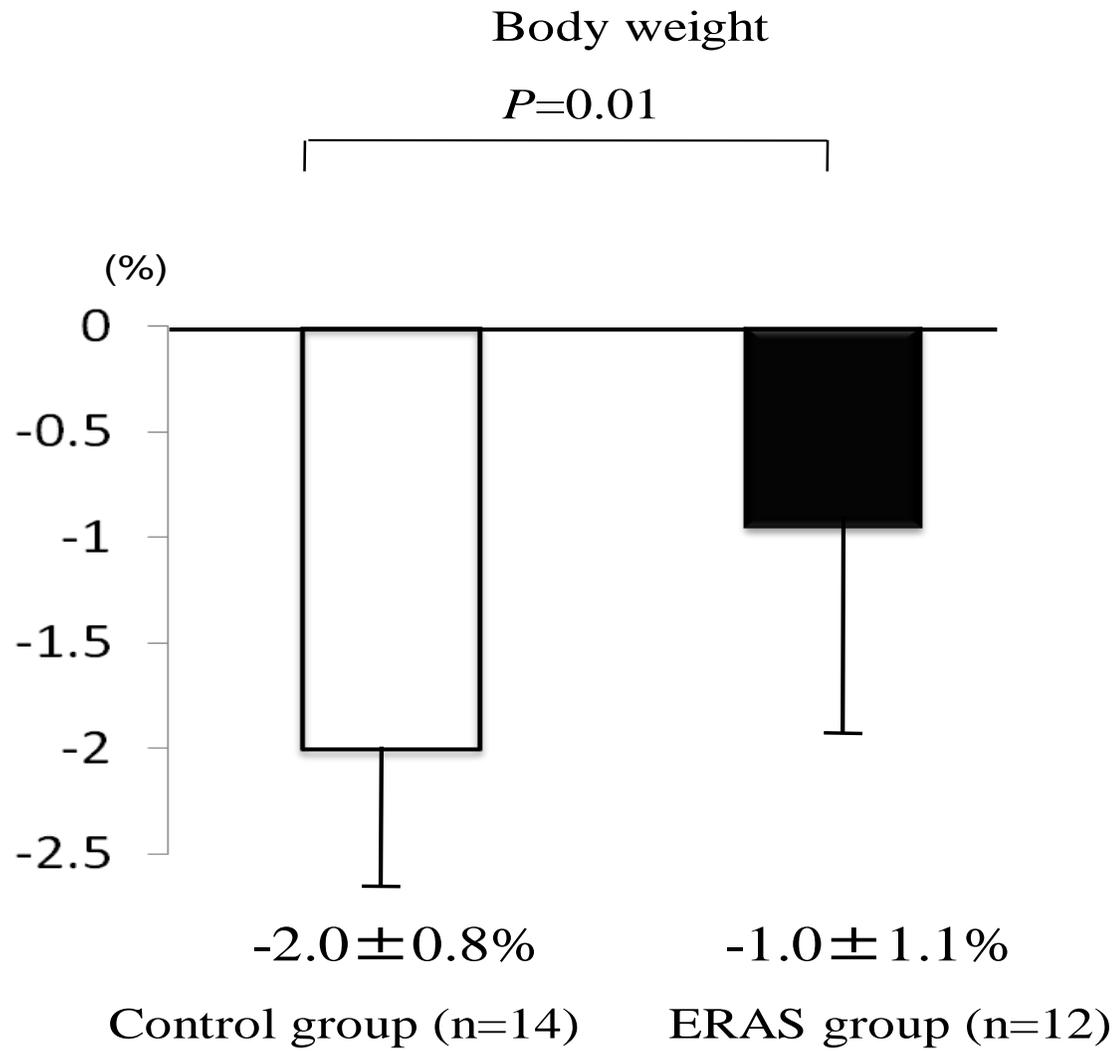


ERAS group



At 12:00 Measurement of the amount of total body water (TBW) and body weight (1st measurement).

At 8:00 Measurement of the amount of total body water (TBW) and body weight (2nd measurement).



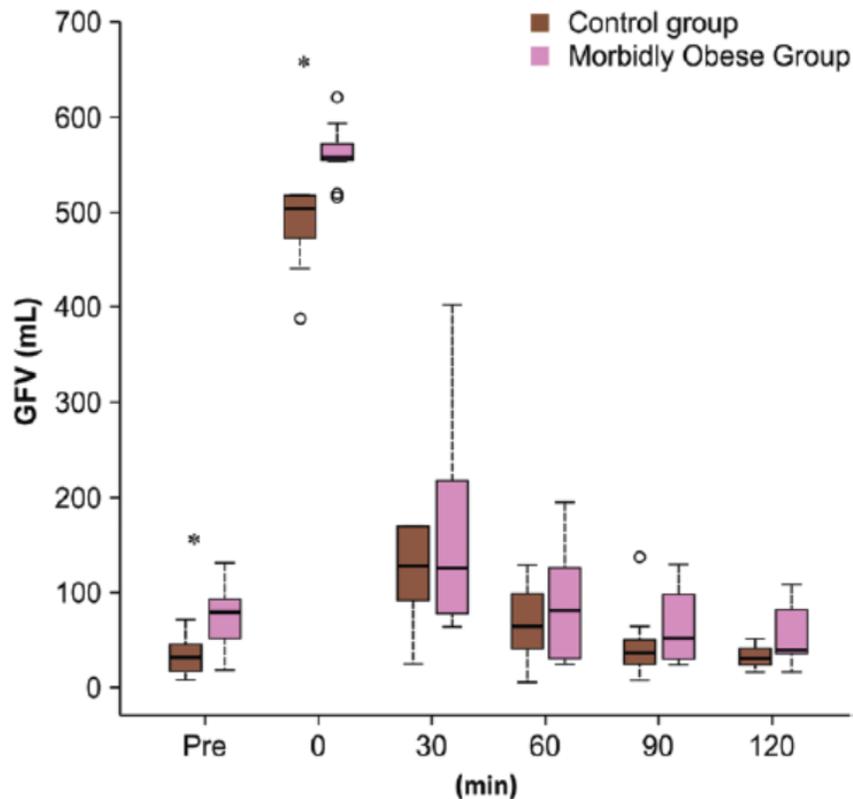
Taniguchi H, Sasaki T, Fujita H. Preoperative management of surgical patients by "shortened fasting time": a study on the amount of total body water by multi-frequency impedance method. *Int J Med Sci.* 2012;9(7):567-74. Epub 2012 Sep 5.

病的肥満患者への術前経口補水療法

受賞論文⑤

Gastric Fluid Volume Change After Oral Rehydration Solution Intake in Morbidly Obese and Normal Controls: A Magnetic Resonance Imaging-Based Analysis.

Toshie Shiraishi, Hideki Taniguchi, et al. Anesth Analg 2017;124:1174-8



結論

MRIで、胃残液量を追跡

- 病的肥満患者では絶食後に胃残液量が多い
- 経口補水液摂取後では胃残液量は非肥満者と同等
- 術前経口補水療法は病的肥満者でも安全である

外科医とERAS導入効果、安全性の検討

受賞論文②

Usefulness of enhanced recovery after surgery protocols compared with conventional perioperative care in gastric surgery.

Takanobu Yamada · Hideki Taniguchi , et al. Gastric Cancer. 2012 Jan;15(1):34-41.

受賞論文⑦

Feasibility of enhanced recovery after surgery in gastric surgery: a retrospective study.

Yamada T, Hideki Taniguchi , et al. BMC Surg. 2014 Jul 8;14(1):41. doi: 10.1186/1471-2482-14-41.

受賞論文⑧

An Institutional Experience of Introducing an Enhanced Recovery After Surgery (ERAS) Program for Pancreaticoduodenectomy

Toru Aoyama, Hideki Taniguchi , et al. Int Surg 2016;101:542–549

結論

わが国の消化器外科手術にERASを導入した結果

- ・安全性に関しては従来群と同等
- ・胃切除、膵頭十二指腸切除術に認容性あり

術中鎮痛による術後インスリン抵抗性への影響

受賞論文⑥

The Effect of Intraoperative Use of High-Dose Remifentanil on Postoperative Insulin Resistance and Muscle Protein Catabolism: A Randomized Controlled Study.

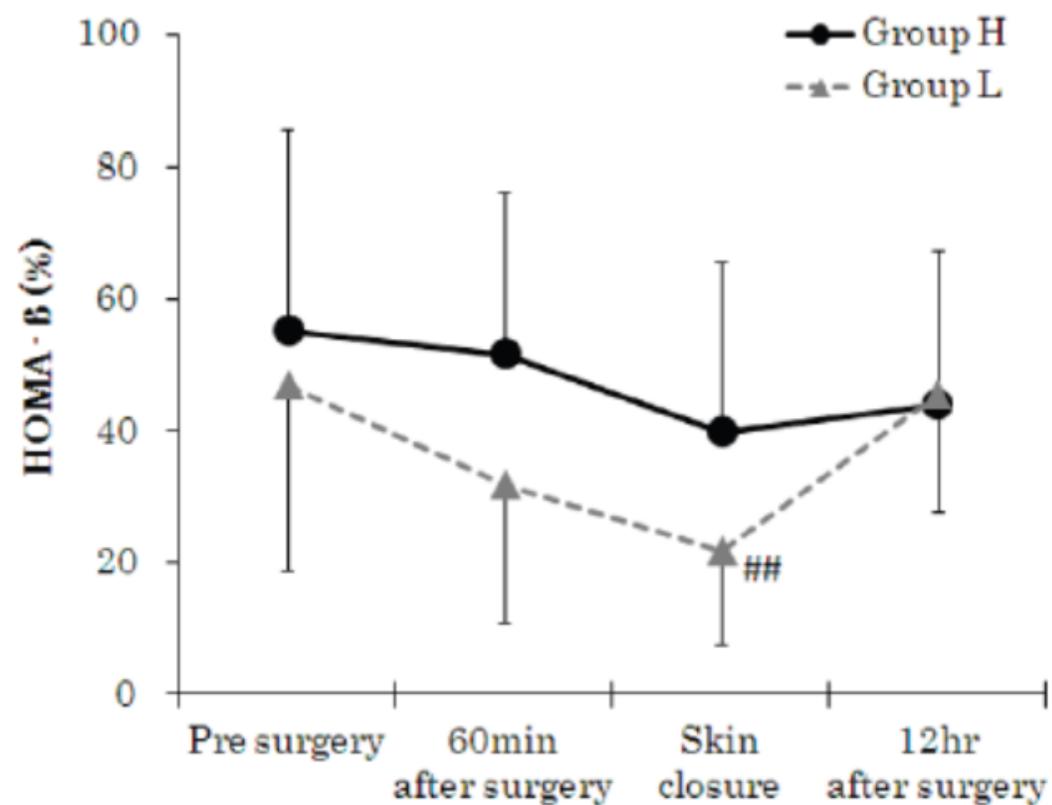
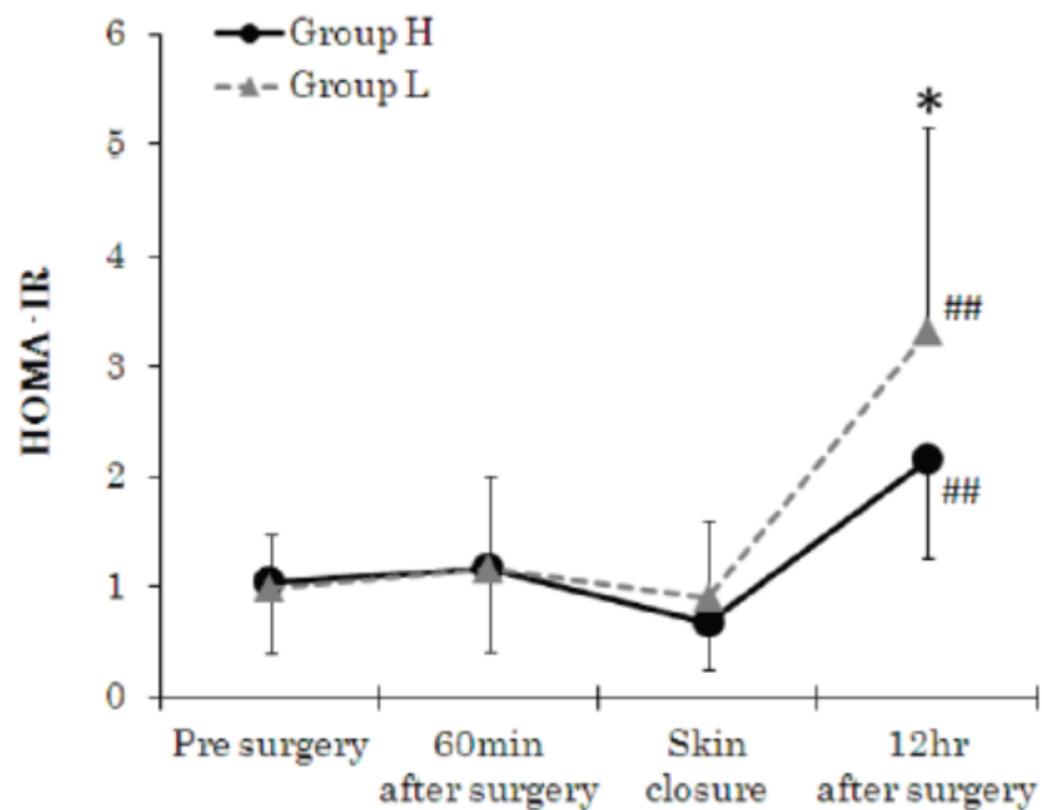
Hideki Taniguchi , et al. Int. J. Med. Sci. 2013, Vol. 10(9):1099-1107.

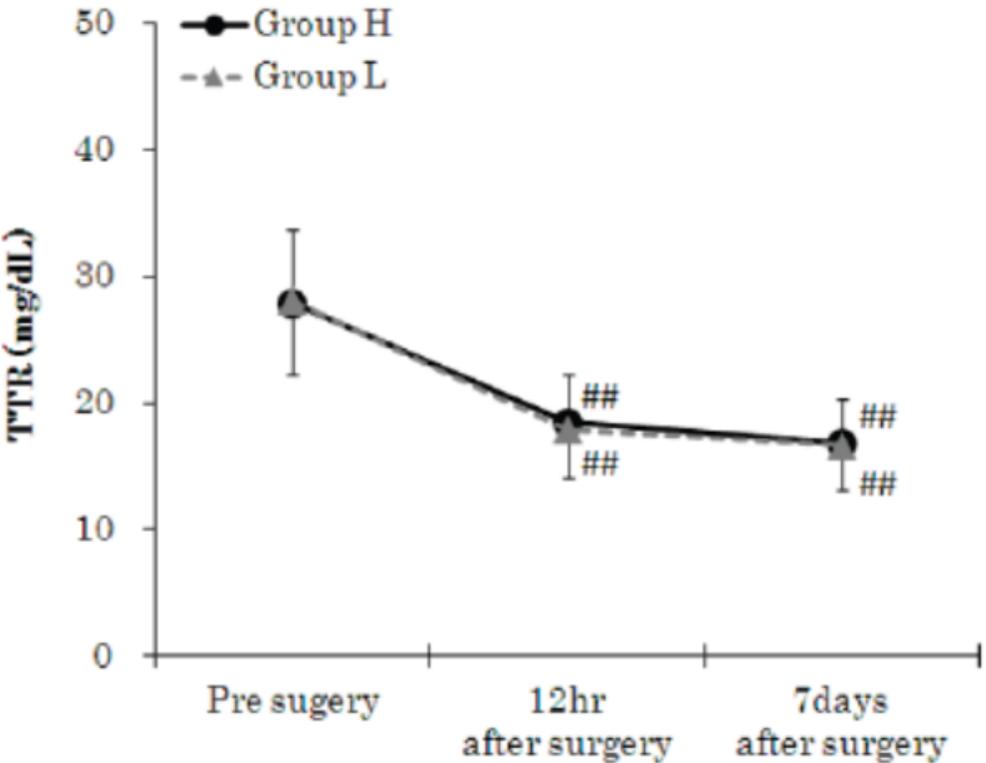
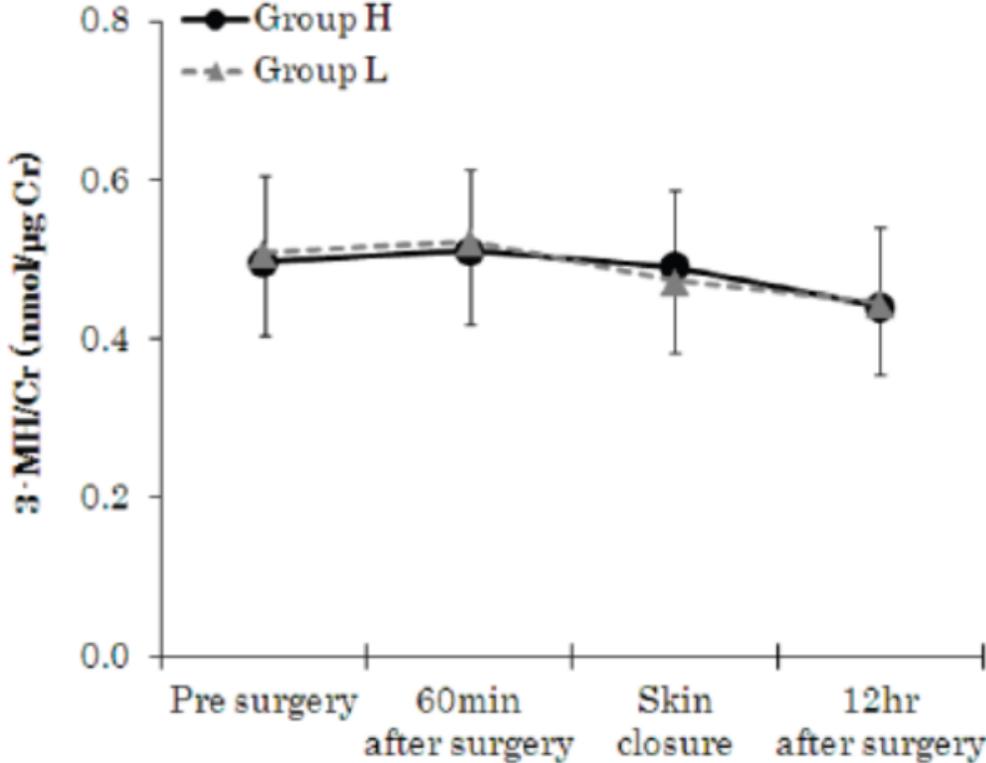
結論

高容量のレミフェンタニルにより

- ・術後12時間のインスリン抵抗性を減弱できる
- ・しかし、術後の異化を抑制することはできなかった

Fig 1. Flow diagram (progress steps of the trial: selection and randomization of elective gastrectomy patients to receive low- or high-dose remifentanyl anaesthesia).





わが国のERAS=Modified ERASのアウトカム

受賞論文④

Modified ERAS protocol using preoperative oral rehydration therapy: outcomes and issues.

Hideki Taniguchi et al. J Anesth. 28(1):143-7. 2014

結論

Modified ERAS管理により

- 術前体液の正常化
- 鎮痛剤の追加投与が減少
- 胃切後の経口摂取量の維持可能
- 術後の体重減少を軽減

しかし、

- 在院日数の短縮・再入院率に変化は認められず

胃がん手術
における
Modified
ERAS

Table 1 Modified ERAS[®] protocol (MEP) in gastric surgery

Operative day	-1	0	+1	+2	+3	+4	+5	+6	+7
Oral intake	Normal diet until midnight	Oral hydration solution (OS-1 [®]) 3 h before surgery		Drink water and oral nutrition supplement (Ensure Liquid)	Liquid diet (3 steps up to soft diet every 2 days)				
Bowel preparation	1 g magnesium oxide and New Lecicarbon [®] suppository								
Anesthesia and Analgesics		Combination of epidural analgesia (TH7-11) and general anesthesia during surgery Continuous thoracic epidural infusion of analgesics after surgery Nonsteroidal anti-inflammatory drug intravenously after surgery twice daily	→	Removing epidural catheter Acetoaminophen three times a day orally	→	→	→		
Drain and NGT		No drain in distal gastrectomy, one or two drains in total gastrectomy NGT was removed immediately after surgery		Removing drain(s)					
ADL			Encourage to sit out of bed for more than 6 h	Encourage to walk the length of the ward	→	→	→	→	→
Antithromboprophylaxis			None	Subcutaneous injection of antithrombotic agent (enoxaparin sodium or fondaparinux)	→	→	None	→	→

Modified ERAS protocol using preoperative oral rehydration therapy: outcomes and issues.
Hideki Taniguchi et al. J Anesth. 28(1):143-7. 2014

GDT・アセトアミノフェン定時投与を併用した ERASプロトコルの効果

受賞論文⑨

Effects of goal-directed fluid therapy on enhanced postoperative recovery: An interventional comparative observational study with a historical control group on oesophagectomy combined with ERAS program
Hideki Taniguchi, et al. 184–193 Published online: October 25, 2017 Open Access

Clinical Nutrition ESPEN 23 (2018) 184–193



Contents lists available at [ScienceDirect](#)

Clinical Nutrition ESPEN

journal homepage: <http://www.clinicalnutritionespen.com>



Original article

Effects of goal-directed fluid therapy on enhanced postoperative recovery: An interventional comparative observational study with a historical control group on oesophagectomy combined with ERAS program



Hideki Taniguchi ^{a,*,1}, Toshio Sasaki ^b, Hisae Fujita ^b, Hiroko Kobayashi ^b,
Rieko Kawasaki ^b, Takashi Ogata ^c, Haruhiko Cho ^c, Takaki Yoshikawa ^c, Keiko Ushigome ^a,
Akemi Tanaka ^a, Osami Takano ^b

^a Department of Nutrition, Faculty of Human Services, Kanagawa University of Human Services, 1-10-1 Heisei, Yokosuka, Kanagawa 238-8522, Japan

^b Department of Anaesthesiology, Kanagawa Cancer Centre, 2-3-2 Nakao, Asahi-Ku, Yokohama, Kanagawa 241-8515, Japan

^c Department of Gastrointestinal Surgery, Kanagawa Cancer Centre, 2-3-2 Nakao, Asahi-Ku, Yokohama, Kanagawa 241-8515, Japan

ERAS+GDT+アセトアミノフェン静注液の定時投与

Table 1
Modified enhanced recovery after surgery (M-ERAS) program for patients undergoing resection for oesophageal cancer.

Period	M-ERAS program (Group H) Major components ^a	GDT-M-ERAS program (Group S) Major components ^a
Preoperative	Nutritional therapy if needed Intake of oral rehydration solution ^b until 2 h before surgery Reduction in laxative medication Thorough oral cavity care	Nutritional therapy if needed Intake of oral rehydration solution ^b until 2 h before surgery Reduction in laxative medication Thorough oral cavity care
Intraoperative	Use of short-acting anaesthetics Keeping the patient warm ^c Removal of a nasogastric tube	Use of short-acting anaesthetics Keeping the patient warm ^c Removal of a nasogastric tube
Postoperative	Non-haemodynamic monitoring based fluid therapy ^d Early ambulation (POD 1) Early enteral feeding (POD 1) ^e Non-haemodynamic monitoring based fluid therapy Epidural analgesia with 0.2% ropivacaine 200 mL, physiological saline 80 mL, and fentanyl 1000 µg Additional pain control with NSAIDs and as-needed basis administration of weak opioid (fentanyl 1A)	Haemodynamic monitoring based fluid therapy (GDT) Early ambulation (POD 1) Early enteral feeding (POD 1) ^f Haemodynamic monitoring based fluid therapy (GDT) Epidural analgesia with 0.2% ropivacaine 200 mL, physiological saline 80 mL, and fentanyl 1000 µg Additional pain control primarily with intravenous acetaminophen injection and as-needed basis administration of NSAIDs

介入により術後の消化管ぜん動運動が促進



† Cochran–Mantel–Haenszel (CMH) test: significant when p < 0.05

Fig. 6 Changes in the location of the migrating front of Gastrografin and its

介入により術後のリハビリが促進

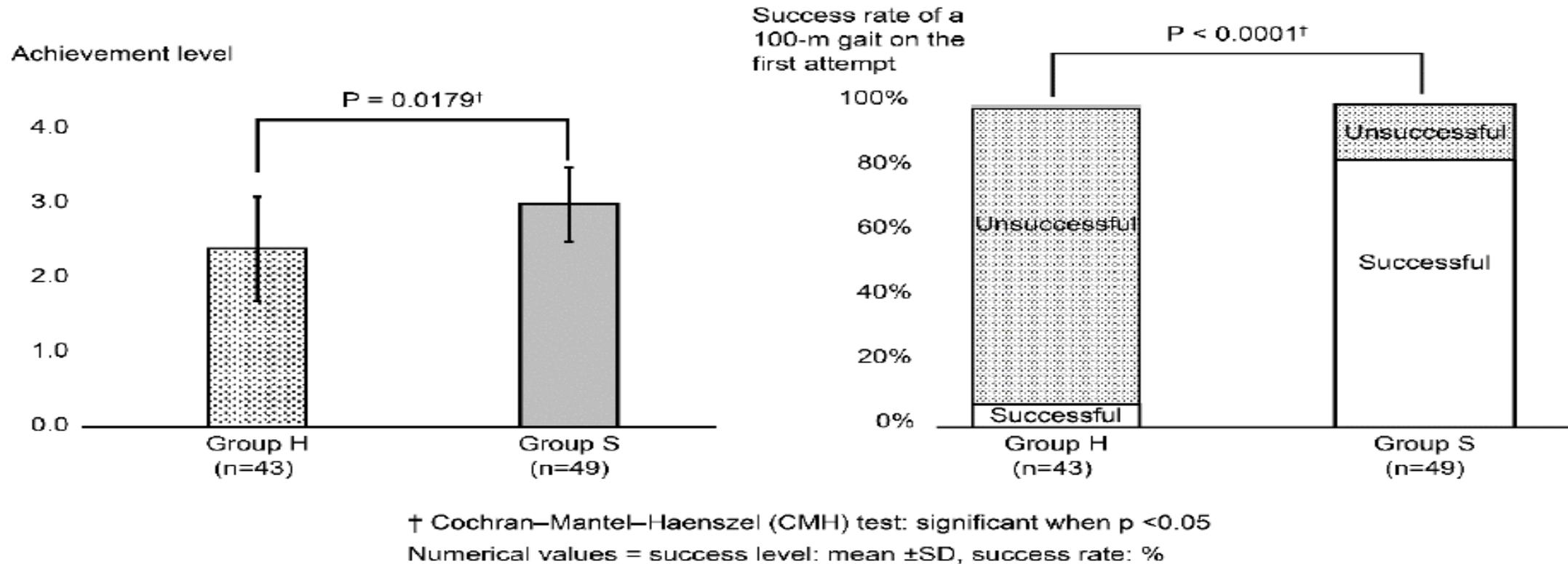


Fig. 7 Levels of the ambulation program achievement (left) and success rates of a 100-m gait on the first attempt (right) on POD 1



日本外科代謝栄養学会

JAPANESE SOCIETY for SURGICAL METABOLISM and NUTRITION.

ESSENSEとは？

術後回復促進のESSENSEとは？

Essential Strategy for Early Normalization after Surgery with patient's Excellent satisfactionの略称で、日本外科代謝栄養学会による臨床的成果を目的としたプロジェクトの名称。

プロジェクトの基本方針：

「手術の安全性を向上させつつ、患者満足をともなった術後回復促進対策のエッセンスは何かを検討し、これらに関する科学的根拠に基づいた情報を提供する」

外科医とわが国の医療に即したERASを発信



日本外科代謝栄養学会

JAPANESE SOCIETY for SURGICAL METABOLISM and NUTRITION.

ESSENSEとは？

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ESsential Strategy for Early Normalization after Surgery with patient's Excellent satisfactionの略称で、日本外科代謝栄養学会による臨床的成果を目的としたプロジェクトの名称。

ESSENSE
基本理念

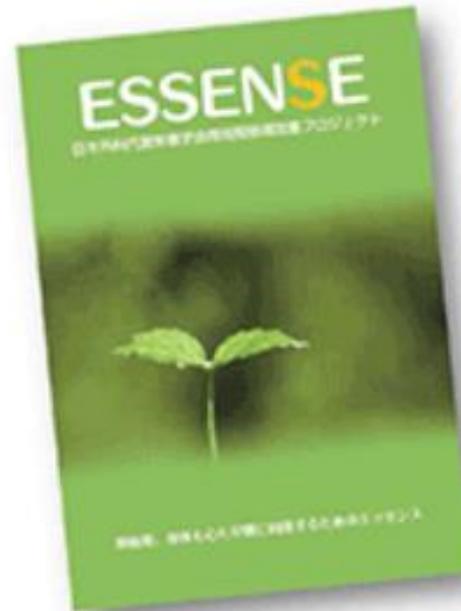
生体侵襲反応の軽減
身体活動性の早期自立
栄養摂取の早期自立
周術期不安軽減と回復意欲の励起

ESSENSE

日本外科代謝栄養学会周術期管理改善プロジェクト

Essential Strategy for Early Normalization after Surgery
with patient's Excellent satisfaction

周術期、身体も心も早期に回復するためのエッセンス



ERASの普及が世界の周術期管理を変えている。

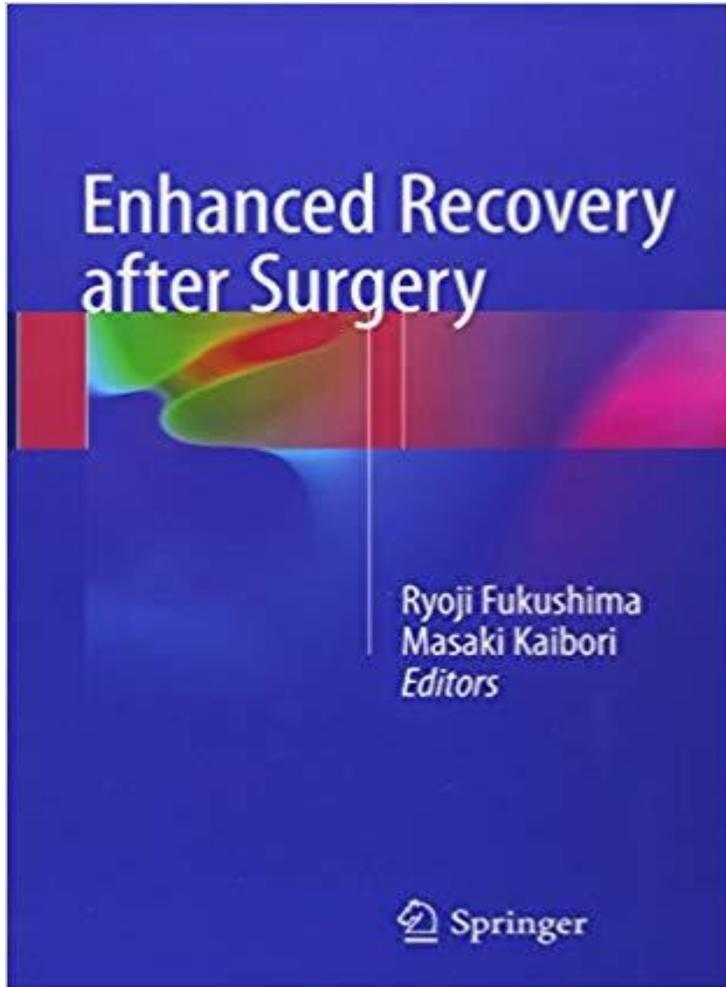
早く元気になる、早く社会復帰ができる。

しかし無理やり在院期間を短縮させるのではなく、本当に満足いく身体的回復促進に必要なことはなにか？

より深くERASを知り、日本に合った発展を期待するにはどうすれば良いのか。

日本外科代謝栄養学会の周術期管理ワーキンググループメンバーがERASの中身を吟味し、ESSENSEプロジェクトとして、分かりやすく解説。

わが国から世界へERAS(ESSENSE)を発信



Enhanced Recovery after Surgery (英語) ハードカバー – 2018/1/25

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Taniguchi H Minimizing the Length of the Preoperative Fasting Period to Prevent Stress and Dehydration. In: Fukushima R., Kaibori M. (eds) Enhanced Recovery after Surgery. Springer, Singapore 2018.P13-P20

わが国への
ERAS普及を
目的に



2017年4月 初版
2018年9月 第二版

私の臨床麻酔における研究テーマ; ERAS

今回の受賞対象

現在の研究

術前絶飲食ガイドライン

体液管理（術前・術中）

術後疼痛管理・PONV対策

外科医とESSENSE

プレハビリテーション（ロイシン）

わが国における
ERASの普及

わが国の医療環境に見
合ったERAS=ESSENSE

さらなる術後回復促進へ
PONV・サルコペニア対策

受賞の御礼と謝辞

ご指導に感謝いたします

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