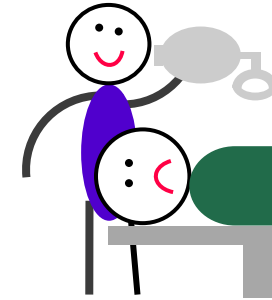


Unrestricted Drinking before Surgery using Fasting Cards

Dr. med. Anne Rüggeberg, MPH

Helios Klinikum Emil von Behring, Berlin
Department of Anaesthesiology and Pain Therapy
Head of Department Dr. Eike Nickel, MaHM

Fasting Rules

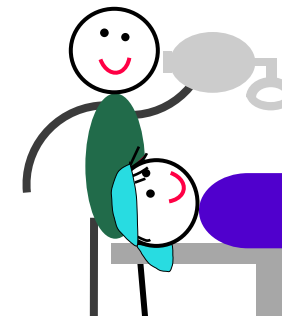


- 2 h

Anaesthesia

Guideline Children 2022

- 1 h



Fasting times (h) with 6 - 4 - 2 - rule

Autor	Patient (number)	Age group	Fasting for liquids (median)
Van de Putte, 2017	512	Adults	10.8 h
Falconer, 2014	292	Adults	9.4 h
Rüggeberg, 2022	270	All	12.0 h
Engelhardt, 2011	1350	Children	7.9 h
Newton, 2017	7000	Children	6.3 h

Putte et al. Brit J Anaesth 2017;118:363-71

Rüggeberg, Nickel. Anaesthesia 2022;12:1386-1394

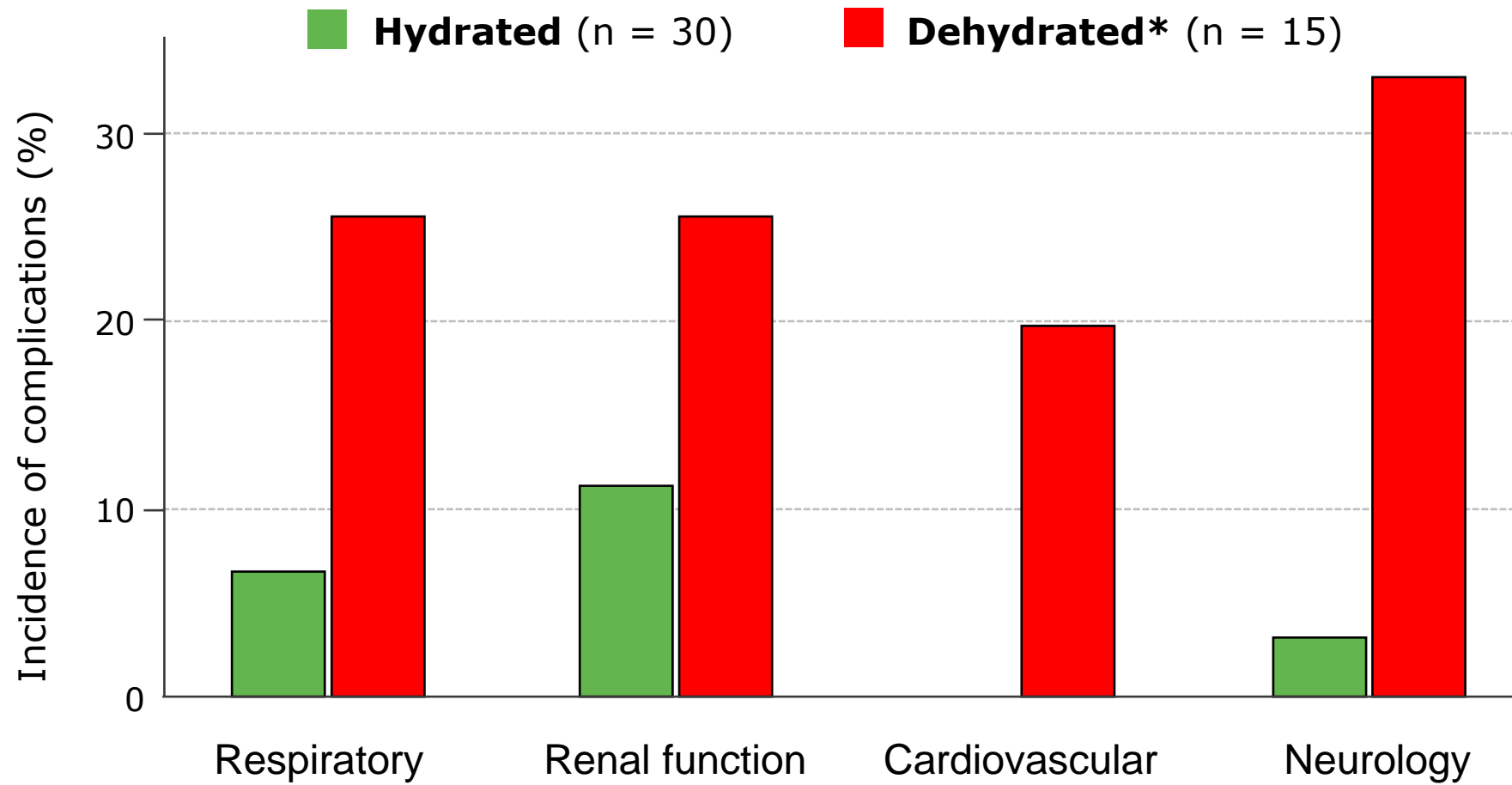
Falconer et al. Updates Surg 2014;66:31-39

Engelhardt et al. Pediatric Anesthesia 2011;21:964-96

Newton et al. Pediatric Anesthesia 2017;27:793-800

Complications after Hip Fracture Surgery

Incidence of complications 40–48 h after hip fracture surgery



* Dehydrated : urine specific gravity $\geq 1,020$

Ylinenvaara. Eur J Anaesthesiol 2014;31:85-90

Response to our letter to the editor

„...that I consider it a **violation of human rights** when I receive an elderly, helpless person for anaesthesia induction in the afternoon and he reports to me that the nurse **had forbidden him to drink all day long.**“

Medical specialist with decades of professional experience

Fasting – Not me!



**Intentionally breaking
the rules of fasting
liquid/food (food only)**

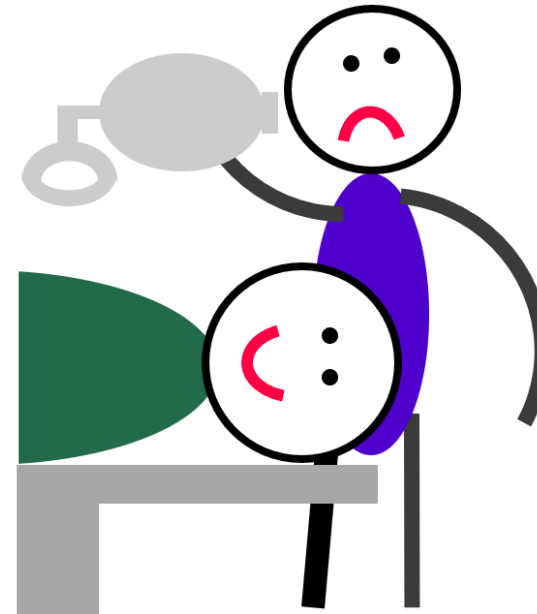
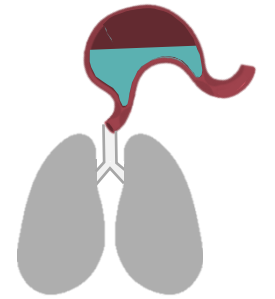
**Would lie if the operation
was delayed because of
the lack of fasting**

Cantellow	Children	13.5% (3%)	
Lim	Adults	4.6%	16.9%
Laffey	Adults	3.5% (2%)	
Walker	Adults	2.0%	4%

Cantellow et al. *Pediatr Anesth* 2012;22:897–900
Lim et al. *Singapore Med J* 2014; 55:18-23

Laffey et al. *Ir J Med Sci* 1998;167:160–163
Walker et al. *Anaesth Intensive Care* 2006;34:358-36

Aspiration



Incidence of aspiration in elective surgery

Author	No. of patients	Agegroup	Incidence of aspiration in elective surgery	
Warner, 1993	202 061	Adults	0,025 %	
Walker, 2013	91 368	Children	0,02 %	All recovered all >2h fasting
Habre, 2017	25 232	Children	0,07%	All recovered

Drinking until sent to the operating theatre

Marsman, 2023	16 815	Adults	0,024 %	1 patient died, => Ileus
Andersson, 2015	10 015	Children	0,03%	All recovered

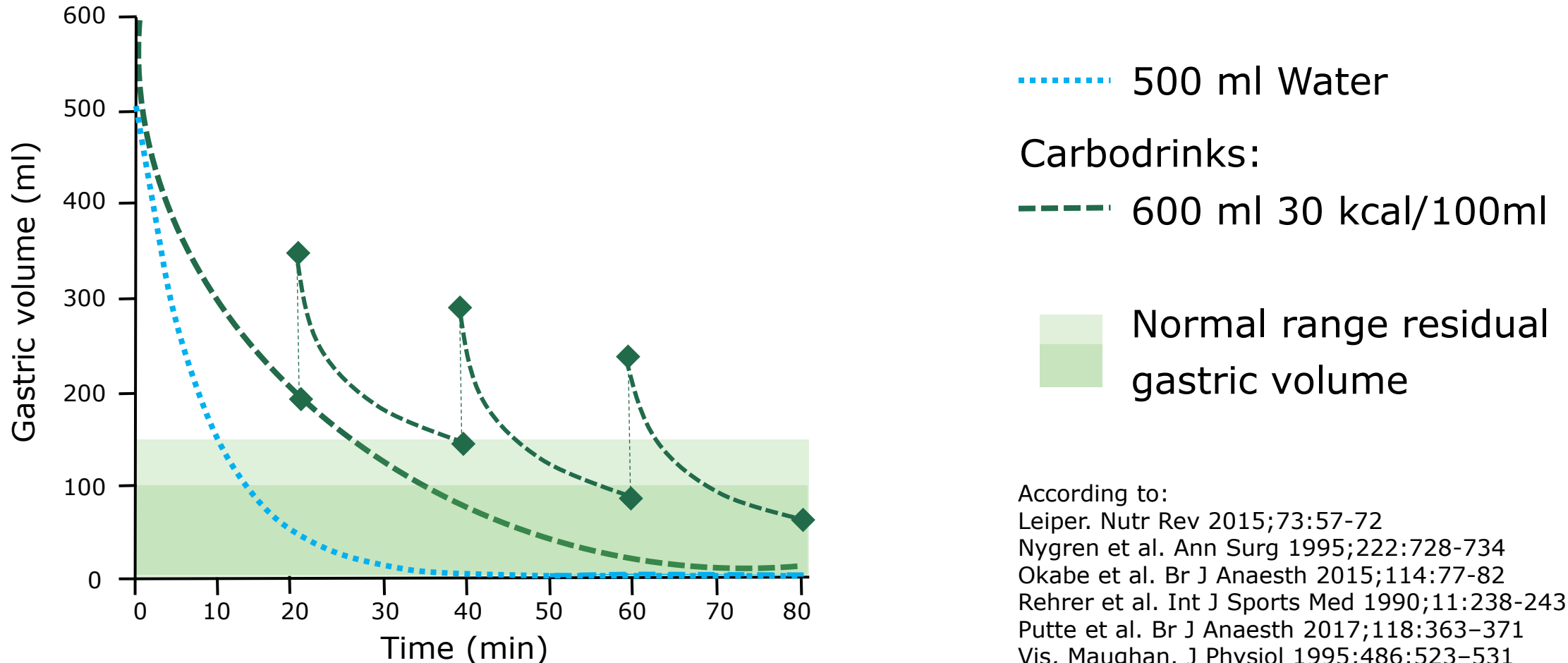
Warner et al. Anesthesiology 1993;78:56-62
Walker et al. Paediatr Anaesth 2013;23:702-711

Marsman et al. JAMA Surgery 2023, online first
Habre et al. Lancet Respir Med 2017;5:412-425

Andersson et al. Paediatr Anaesth 2015;25:770-777

Physiology of gastric emptying

Gastric emptying after drinking various clear liquids



According to:

Leiper. Nutr Rev 2015;73:57-72

Nygren et al. Ann Surg 1995;222:728-734

Okabe et al. Br J Anaesth 2015;114:77-82

Rehrer et al. Int J Sports Med 1990;11:238-243

Putte et al. Br J Anaesth 2017;118:363-371

Vis, Maughan. J Physiol 1995;486:523-531

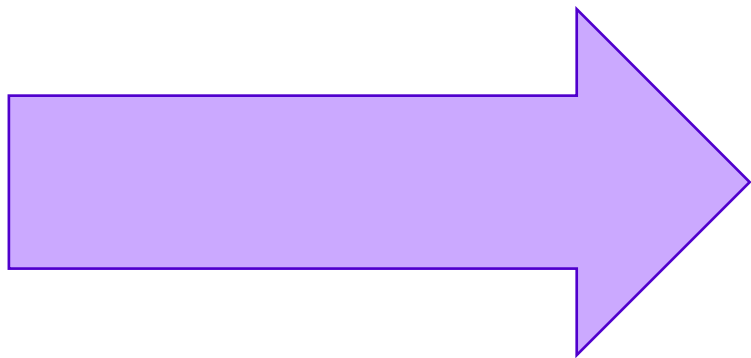
Risk Assessment

Risk of aspiration



Complications from prolonged liquid deprivation

The Decision

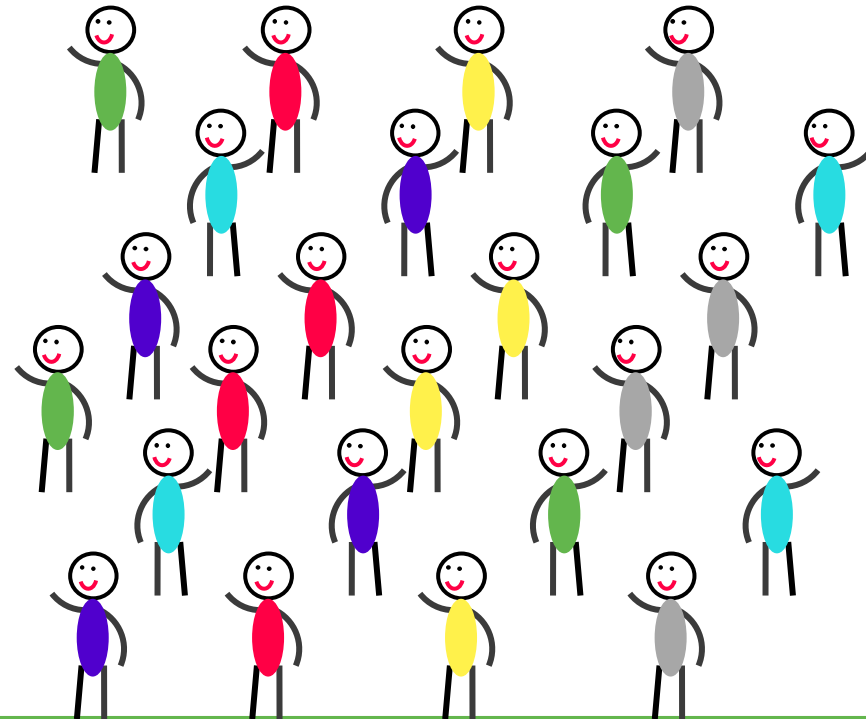
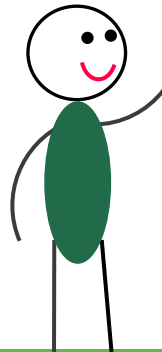


**Establishing a policy of
unrestricted drinking
before surgery**

Unrestricted Drinking before Surgery

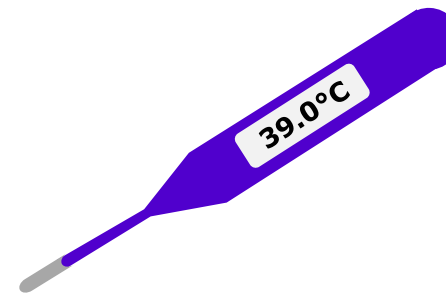
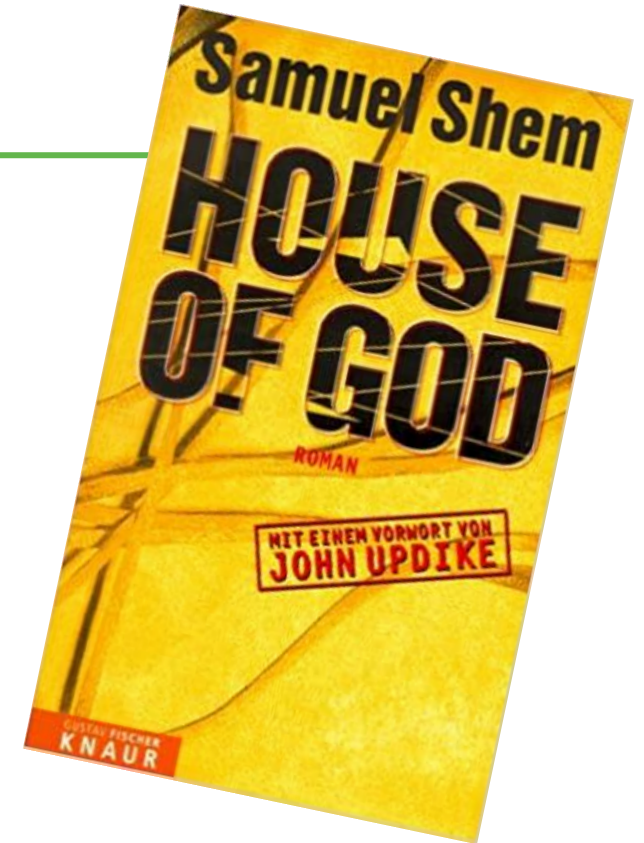
SOP

**Unrestricted Drinking
before Surgery**



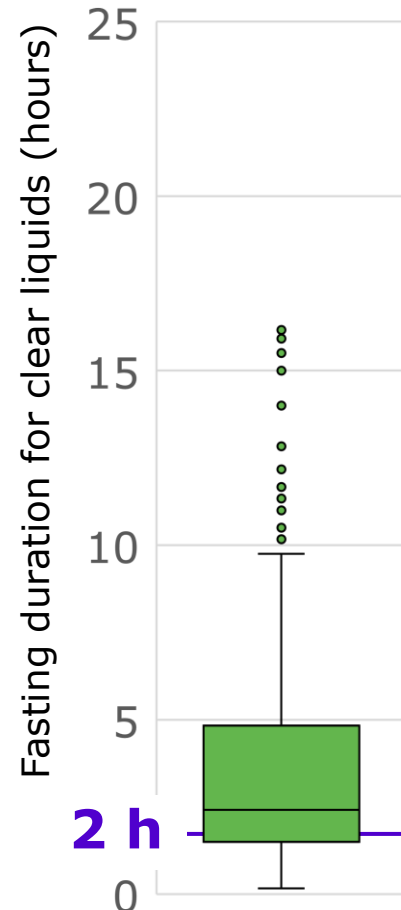
Law No. 10

**If you don't take a temperature,
you can't find a fever.**



Fasting times – “Unrestricted drinking”

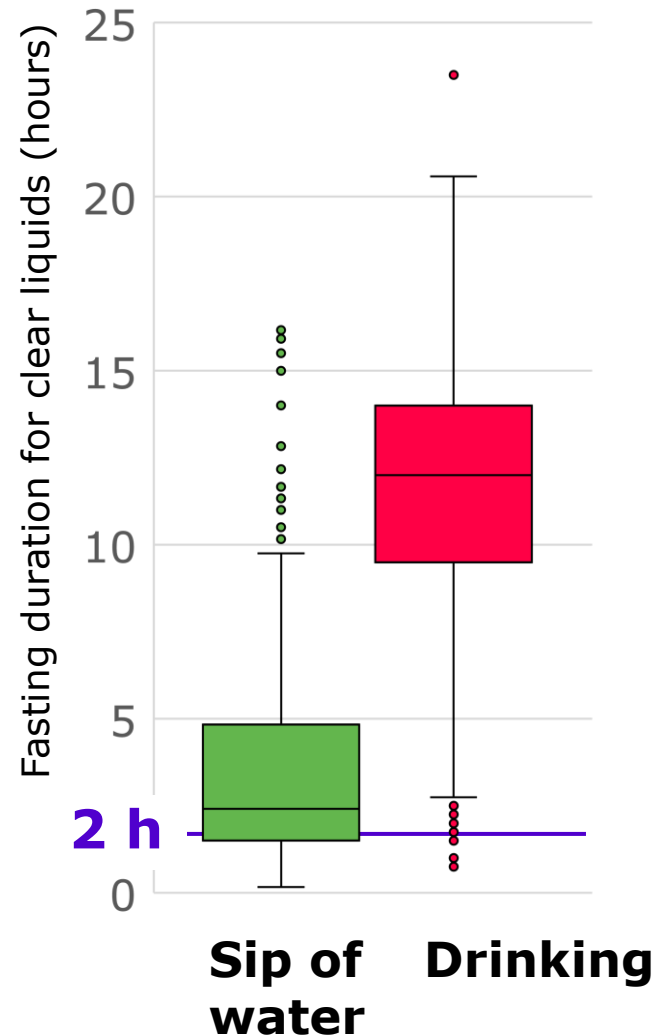
270 patients
prior to elective surgery
allowed unrestricted
drinking before surgery



Median = 2.4 h

Fasting times – “Unrestricted drinking”

270 patients
prior to elective surgery
allowed unrestricted
drinking before surgery



Median = 12 h

Median = 2.4 h

Box-Plot with median, whiskers are 1.5 x IQR

Rüggeberg, Nickel. Anaesthesia 2022;12:1386-1394

Fasting Cards

- Three-level colour-coded system

Fasting Card **red**

Dear Patient,
Due to your disease, operation or
upcoming examinations, you are

**not allowed
to eat or drink
until otherwise
instructed.**

NPO

For your own safety, please adhere to these recommendations.

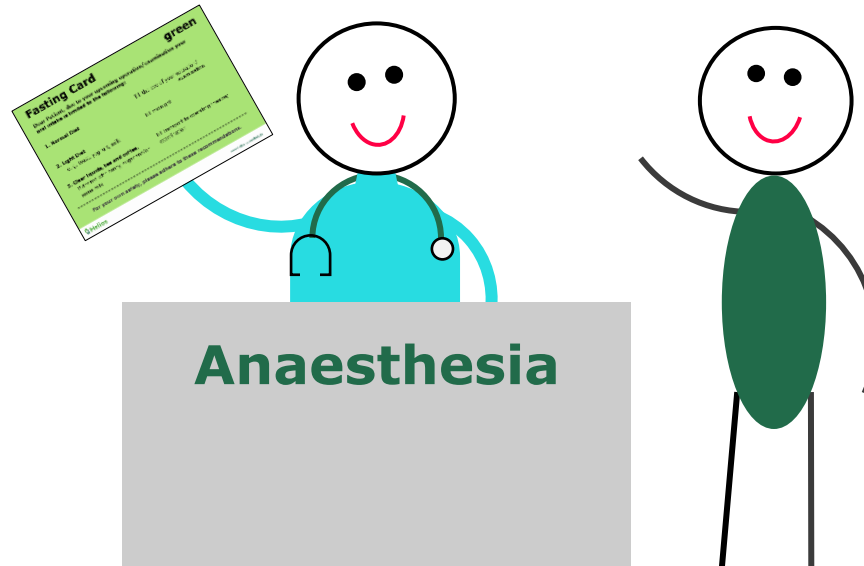
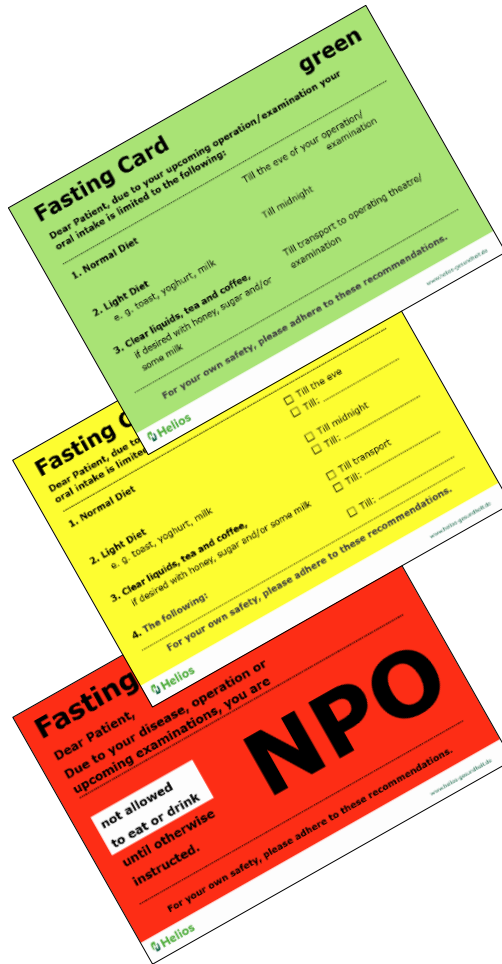
Helios www.helios-gesundheit.de

Patients without significant previous diseases or special surgical features

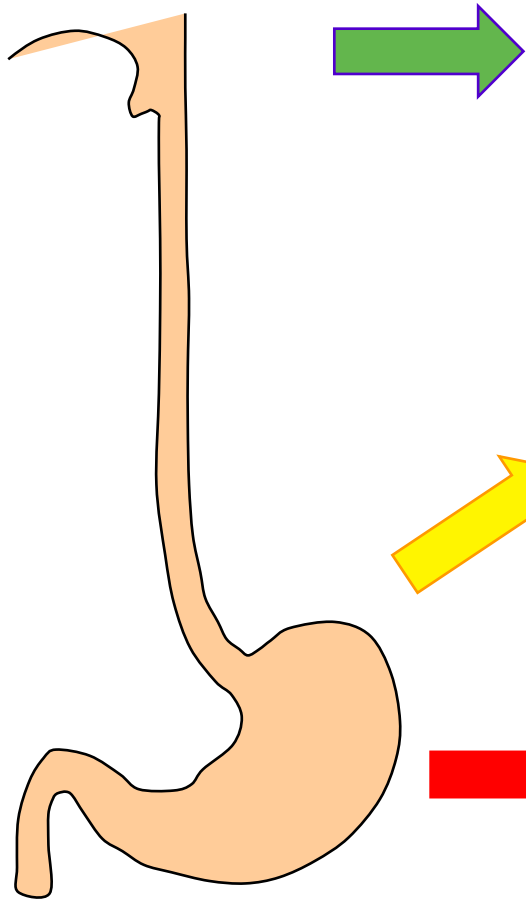
Individualised approach

Patients who are not allowed to eat or drink from the indication onwards

Pre-anaesthetic assessment



Allocation of cards according to aspiration risk



Laryngeal Incompetence

Dysphagia, no effect on gastric emptying

Insufficiency of the lower oesophageal sphincter

Only in case of regurgitations and/or relevant coughing attacks while lying down: 2 hours withdrawal for liquids

Increased residual volume

Nih by mouth from diagnosis onwards!

Fasting Card		green
Dear Patient, due to your upcoming operation/examination your oral intake is limited to the following:		
1. Normal Diet	Till the eve of your operation/examination	
2. Light Diet e. g. toast, yoghurt, milk	Till midnight	
3. Clear liquids, tea and coffee, if deseed with honey, sugar and/or some milk	Till transport to operating theatre/examination	
For your own safety, please adhere to these recommendations.		
Helios <small>www.helios.de</small>		

Fasting Card		yellow
Dear Patient, due to your upcoming operation/examination your oral intake is limited to the following:		
1. Normal Diet	<input type="checkbox"/> Till the eve	
2. Light Diet e. g. toast, yoghurt, milk	<input type="checkbox"/> Till midnight	
3. Clear liquids, tea and coffee, if deseed with honey, sugar and/or some milk	<input type="checkbox"/> Till transport	
4. The following:	<input type="checkbox"/> Till 2 h pre-OP	
For your own safety, please adhere to these recommendations.		
Helios <small>www.helios.de</small>		

Fasting Card		red
Dear Patient, due to your disease, operation or upcoming examinations, you are		
not allowed to eat or drink until otherwise instructed.		NPO
For your own safety, please adhere to these recommendations.		
Helios <small>www.helios.de</small>		

Fasting Card yellow

- Patients with **regurgitation** or **relevant coughing attacks** while lying down

Fasting Card **yellow**


Dear Patient, due to your upcoming operation/examination your oral intake is limited to the following:

.....

1. Normal Diet	<input checked="" type="checkbox"/> Till the eve <input type="checkbox"/> Till:
2. Light Diet e. g. toast, yoghurt, milk	<input checked="" type="checkbox"/> Till midnight <input type="checkbox"/> Till:
3. Clear liquids, tea and coffee, if desired with honey, sugar and/or some milk	<input type="checkbox"/> Till transport <input checked="" type="checkbox"/> Till: 2 hours before surgery
4. The following:	<input type="checkbox"/> Till:

.....

For your own safety, please adhere to these recommendations.

 Helios www.helios-gesundheit.de

Fasting Card yellow

- Patient on dialysis until 2.00 pm

Fasting Card **yellow**


Dear Patient, due to your upcoming operation/examination your oral intake is limited to the following:

.....

1. Normal Diet	<input checked="" type="checkbox"/> Till the eve <input type="checkbox"/> Till:
2. Light Diet e. g. toast, yoghurt, milk	<input type="checkbox"/> Till midnight <input checked="" type="checkbox"/> Till: 8.00
3. Clear liquids, tea and coffee, if desired with honey, sugar and/or some milk	<input checked="" type="checkbox"/> Till transport <input type="checkbox"/> Till:
4. The following:	<input type="checkbox"/> Till:


.....

For your own safety, please adhere to these recommendations.

 Helios www.helios-gesundheit.de

Fasting Card yellow

- Breast-suckling infants

Fasting Card	yellow
Dear Patient, due to your upcoming operation/examination your oral intake is limited to the following:	
.....	
1. Normal Diet	<input type="checkbox"/> Till the eve
	<input type="checkbox"/> Till:
2. Light Diet	<input type="checkbox"/> Till midnight
e. g. toast, yoghurt, milk	<input type="checkbox"/> Till:
3. Clear liquids, tea and coffee,	<input checked="" type="checkbox"/> Till transport
if desired with honey, sugar and/or some milk	<input type="checkbox"/> Till:
4. The following: Breastmilk	<input checked="" type="checkbox"/> Till: <u>3 hours before surgery</u>
.....	
For your own safety, please adhere to these recommendations.	
 Helios	www.helios-gesundheit.de

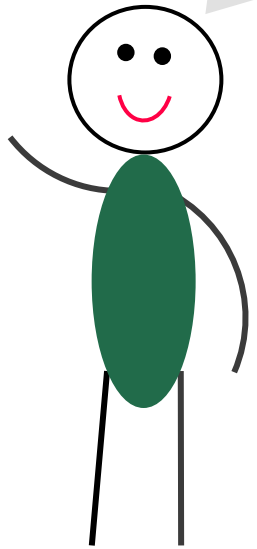
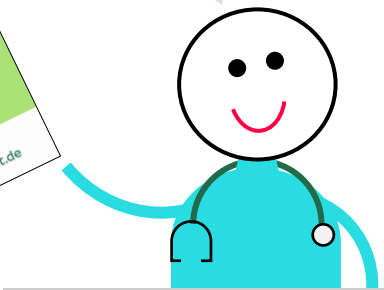
Pre-anaesthetic assessment

Fasting Card
Dear Patient, due to your upcoming operation/examination your oral intake is limited to the following:

Diet	Restriction
1. Normal Diet	Till the eve of your operation/examination
2. Light Diet e. g. tea, coffee, milk	Till midnight
3. Clear liquids, tea and coffee, if desired with honey, sugar and/or some milk	Till transport to operating theatre/ examination

For your own safety, please adhere to these recommendations.

Helios www.helios-gesundheit.de



Anaesthesia

Emergencies: Red Card

Emergency Room

Grandma Agnes,
85 years
Ileus

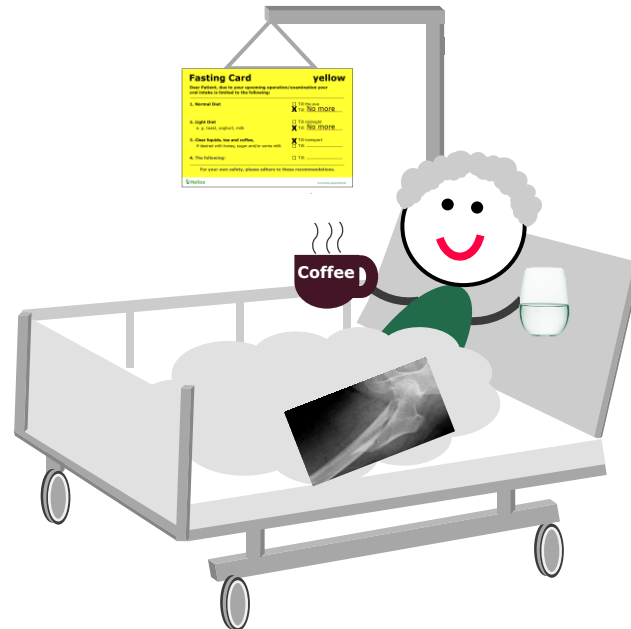


Emergencies: Yellow Card

Emergency Room



Jack, 5 years,
radius fracture



Grandma Agnes,
85 years
acute hip fracture

Fasting Card

yellow

Dear Patient, due to your upcoming operation/examination your oral intake is limited to the following:

1. Normal Diet

Till the eve
 Till: **No more**

2. Light Diet

e. g. toast, yoghurt, milk

Till midnight
 Till: **No more**

3. Clear liquids, tea and coffee,

if desired with honey, sugar and/or some milk

Till transport
 Till:

4. The following:

Till:

For your own safety, please adhere to these recommendations.



www.helios-gesundheit.de

Surgery/ Examination the next day

Fasting Card

green

Dear Patient, due to your upcoming operation/examination your oral intake is limited to the following:

- | | |
|---|---|
| 1. Normal Diet | Till the eve of your operation/
examination |
| 2. Light Diet
e. g. toast, yoghurt, milk | Till midnight |
| 3. Clear liquids, tea and coffee,
if desired with honey, sugar and/or
some milk | Till transport to operating theatre/
examination |

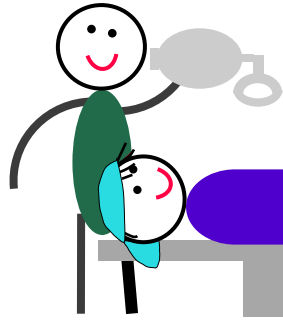
For your own safety, please adhere to these recommendations.

Emergency Room



Grandma Agnes, 85 years,
examination on the following day

Fasting Cards



Anaesthesia

Emergency Department



Bronchoscopy

Cardiology

Gastroenterology

Outpatients and pre-admission patients



RBB Praxis: Wie trinken vor der Operation? Beitrag vom 29.09.2021

Fasting Cards: Reverse side

Nüchternheitskarte GRÜN UKAZANIE PO ПРИЁМУ ПИЩИ: ЗЕЛЕНАЯ КАРТА Açlık kartı YEŞİL البطاقة الخضراء للإمتناع عن الأكل و الشرب

Sehr geehrte Patientin, sehr geehrter Patient, aufgrund Ihrer Operation/Untersuchung dürfen Sie zu sich nehmen:

1. Normale Kost Bis zum Vorabend Ihrer Operation/Untersuchung
2. Leicht verdauliche Mahlzeit, z. B. Toast, Joghurt, Milch Bis Mitternacht
3. Klare Flüssigkeiten, auch Tee und Kaffee, auf Wunsch mit Honig, Zucker Bis zum Abruf in den OP/zur Untersuchung und oder wenig Milch

Bitte halten Sie sich zu Ihrer eigenen Sicherheit an diese Vorgaben.

Değerli hastamız, yaklaşan ameliyatınız / muayeneniz nedeniyle yemek yemenize izin verilenler şunlardır:

1. Normal Yemek Ameliyatınızdan / muayenenizden önceki akşama kadar
2. Hafif Yemek (toast, yoğurt, süt) Gece yarısına kadar
3. Sade içecekler, çay ve kahve (Istenirse bal, şeker ve / veya az süt ile) Ameliyat ve muayene bölümüne çağrılınca kadar

Kendi güvenliğiniz için lütfen bu tavsiyeleri uygulayın.

Уважаемый(ая) пациент(ка), в связи с предстоящей операцией/обследованием для вас разрешена следующая схема питания:

1. Нормальная пища До вечера перед операцией / обследованием
2. Легкоперевариваемая пища, например белый хлеб, йогурт, молоко До полуночи
3. Прозрачные жидкости, включая чай и кофе, при желании с медом, сахаром и / или с добавлением небольшого количества молока До вызова на операцию / обследование

Пожалуйста строго придерживайтесь этих указаний в целях Вашей безопасности.

عزيزي المريض / عزيزتي المريضة، لمرض إجراء العملية أو الفحوصات، يُسمح لك فقط بالشرب و تناول الطعام كالتالي:

1. الطعام العادي. إلى الليلة قبل العملية أو الفحوصات (وجبة العشاء)
2. طعام سهل الهضم، على سبيل المثال: توست، زبادي، حليب. حتى منتصف الليل قبل العملية أو الفحوصات
3. السوائل الصافية كذلك الشاي والتفوه، وحسب الرغبة مع الحليب، السكر والار قليل من الحليب حتى الدعوة للعملية أو الفحوصات

يرجى الالتزام بهذه الإرشادات من أجل سلامتكم.

Bitte halten Sie sich zu Ihrer Sicherheit an diese Vorgaben.
Kendi güvenliğiniz için lütfen bu tavsiyeleri uygulayın.

Пожалуйста строго придерживайтесь этих указаний в целях
Вашей безопасности.

И: ЖЁЛТАЯ КАРТА

البطاقة الصفراء للإمتناع عن الأكل

Sie zu sich nehmen:

شؤونك التالية:

عزيزي المريض / عزيزتي المريضة، لغرض:

s zum Vorabend

r akşam önce

o вечера

إلى الليلة قبل العملية أو الفحوصات (وجبة العشاء)

s / saate kadar / До / حتى:

s Mitternacht

öce yarısına kadar

o полуночи

حتى منتصف الليل قبل العملية أو الفحوصات.

s / saate kadar / До / حتى:

s zum Abruf

ğrılınca kadar

o вызова

حتى الدعوة للعملية أو الفحوصات.

s / saate kadar / До / حتى:

s / saate kadar / До / حتى:

III: КРАСНАЯ КАРТА

البطاقة الحمراء للإمتناع عن الأكل

n dürfen Sie ab sofort
eigenen Sicherheit

rhangig bir şey yemeyin

ания с этого момента
квивайтесь этих

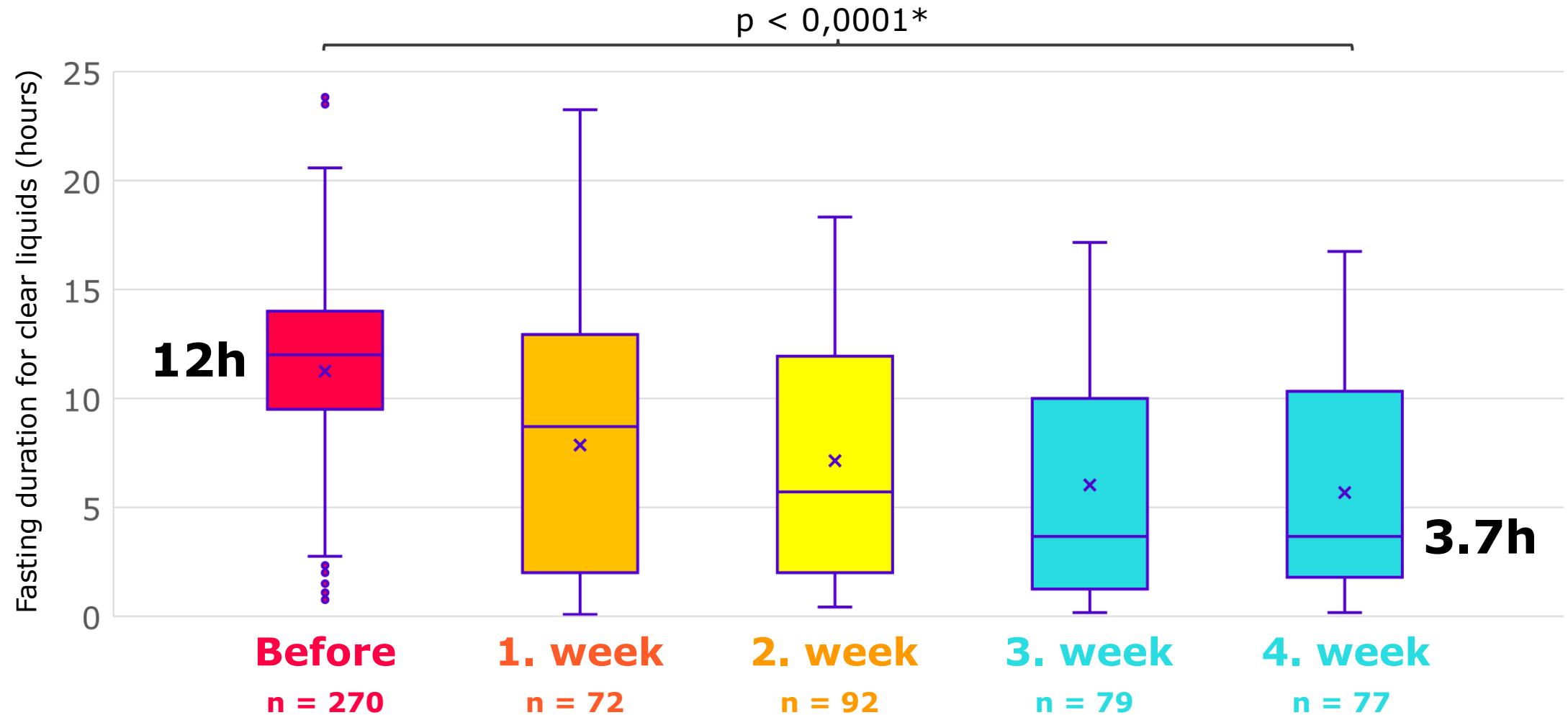
عزيزي المريض، عزيزتي المريضة، بسبب

الآن فصاعدا لم يعد بإمكانك تناول أو شرب أي شيء. يرجى الالتزام بهذا المطلب من أجل سلامتكم.

Disinfection



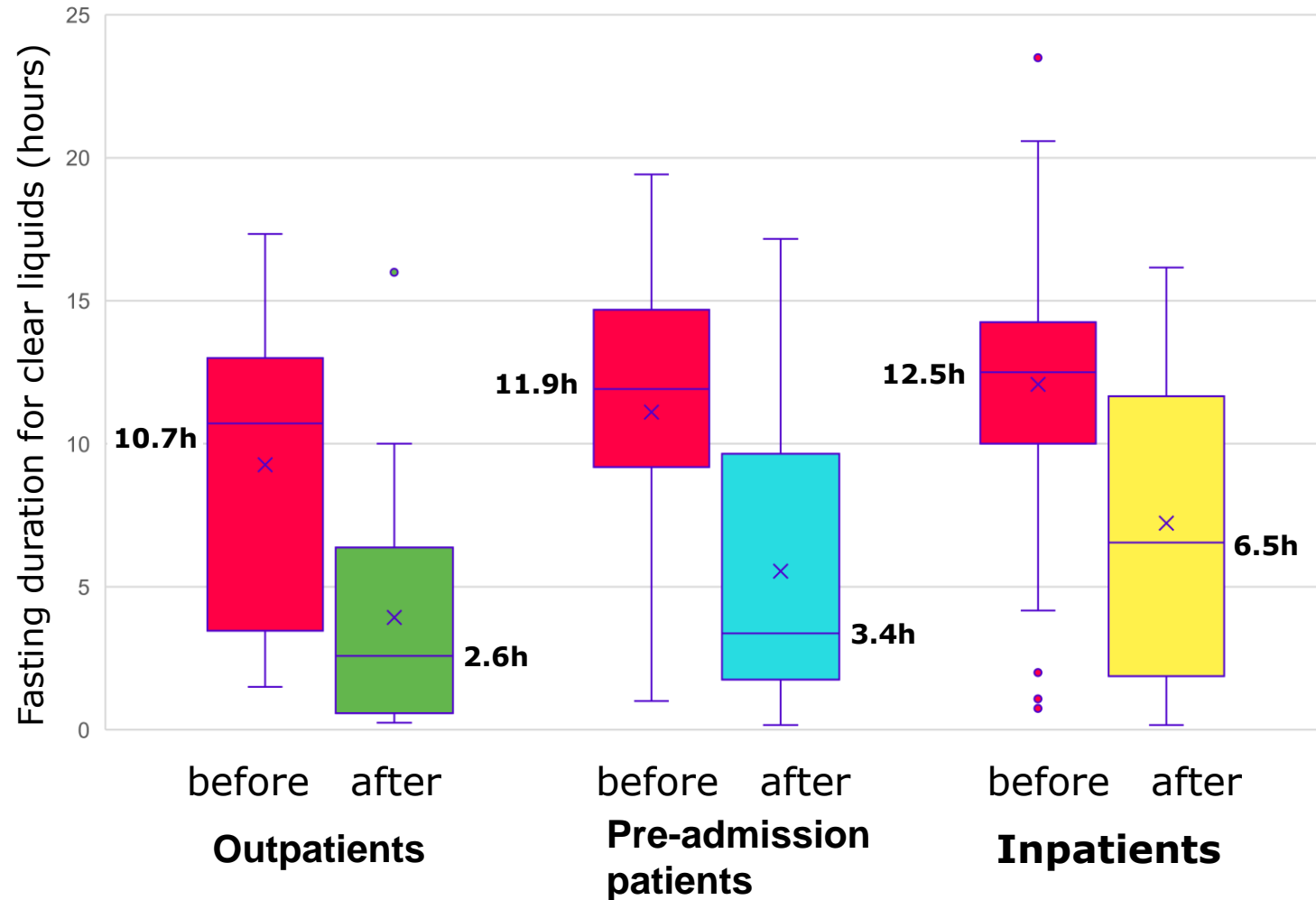
Introduction of Fasting Cards



* Mann-Whitney-U-Test Box-Plot with median, whiskers are 1.5 x IQR

Rüggeberg, Nickel. Anaesthesia 2022;12:1386-1394

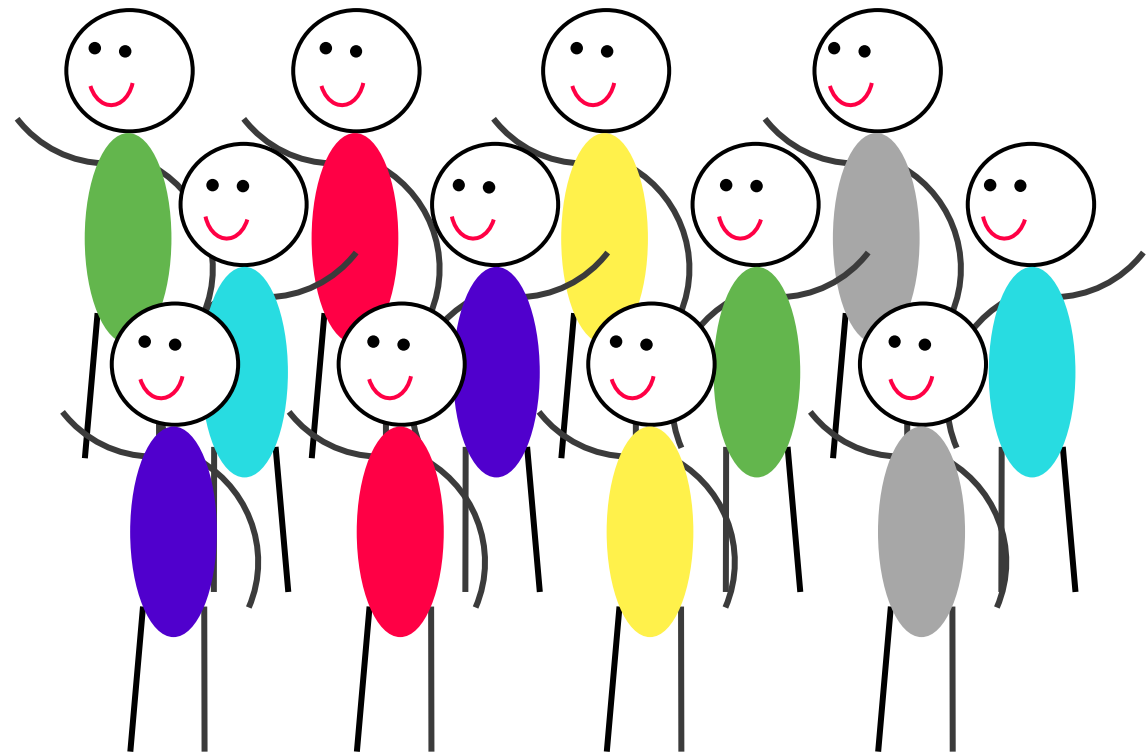
Subgroup analysis



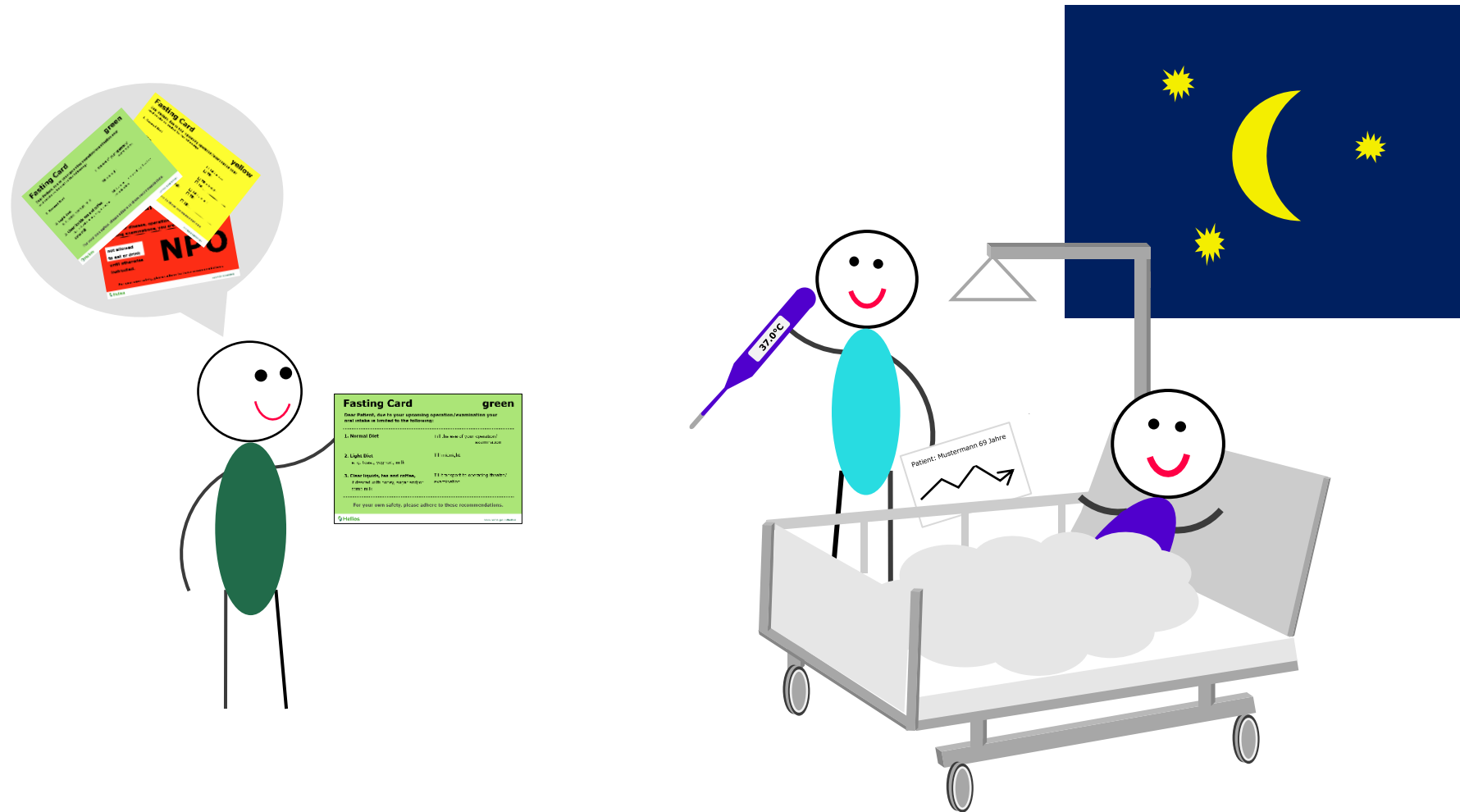
Box-Plot with median, whiskers are 1.5 x IQR

Rüggeberg, Nickel. Anaesthesia 2022;12:1386-1394

Further education



Asking "by the way" ...



Poster Campaign



 **Drinking just before surgery?
We even encourage it here!**

Dr. Eike Nickel
Head of Department of Anaesthesiology and Pain Therapy

Dr. Anne Rüggeberg
Project Leader, Department of Anaesthesiology and Pain Therapy

 **Helios**

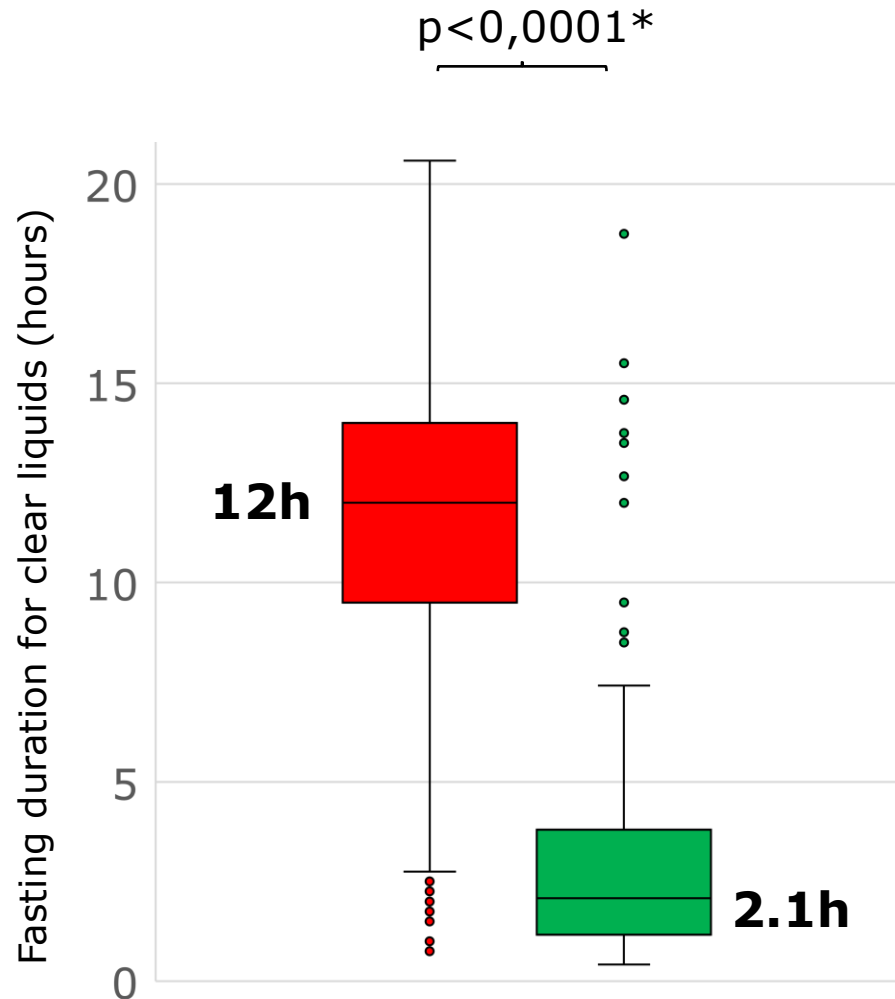
www.helios-gesundheit.de

Anaesthesia
Department

Reception

Wards

Fasting duration before and after 25 weeks

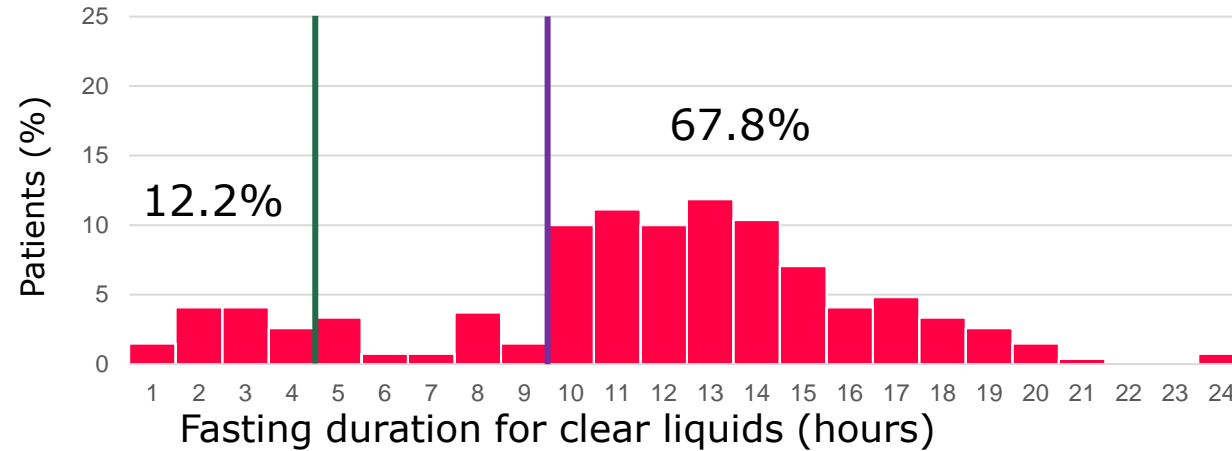


- Before (n=270)
- 25 weeks after the introduction of Fasting Cards (n=143)

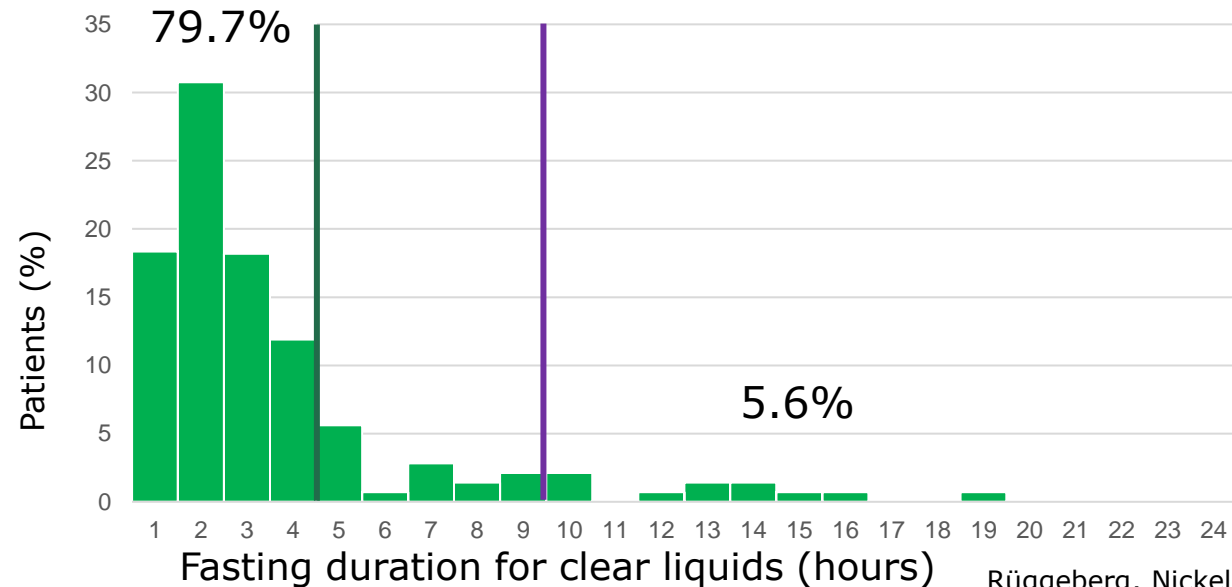
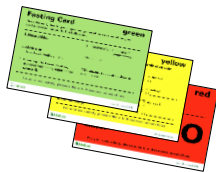
* Mann-Whitney-U-Test Box-Plot with median, whiskers are 1.5 x IQR

Before - after 25 weeks

**Before
the introduction of
Fasting Cards
(n=270)**



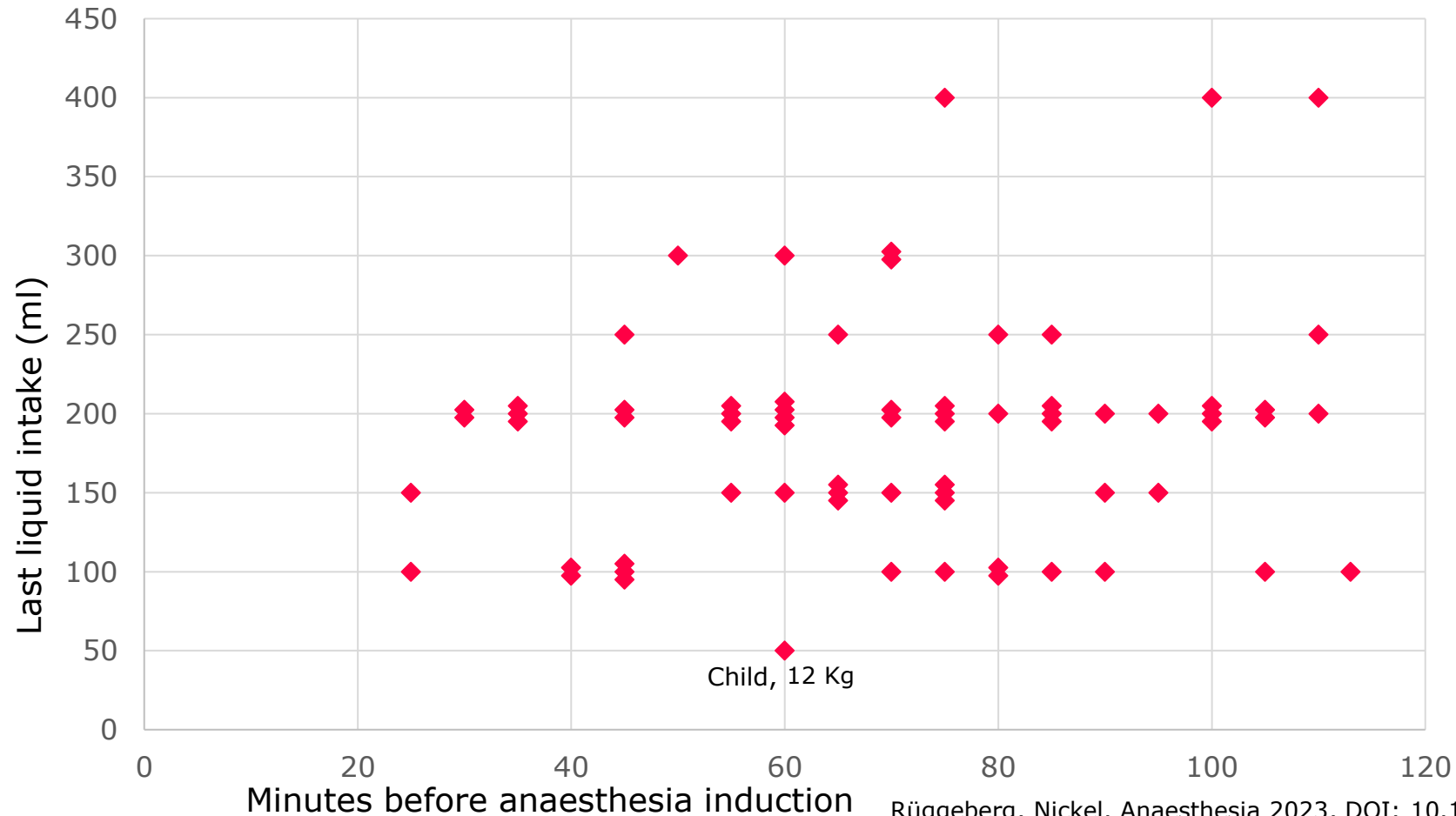
**25 weeks after
the introduction of
Fasting Cards
(n=143)**



Rüggeberg, Nickel. Anaesthesia 2022;12:1386-1394

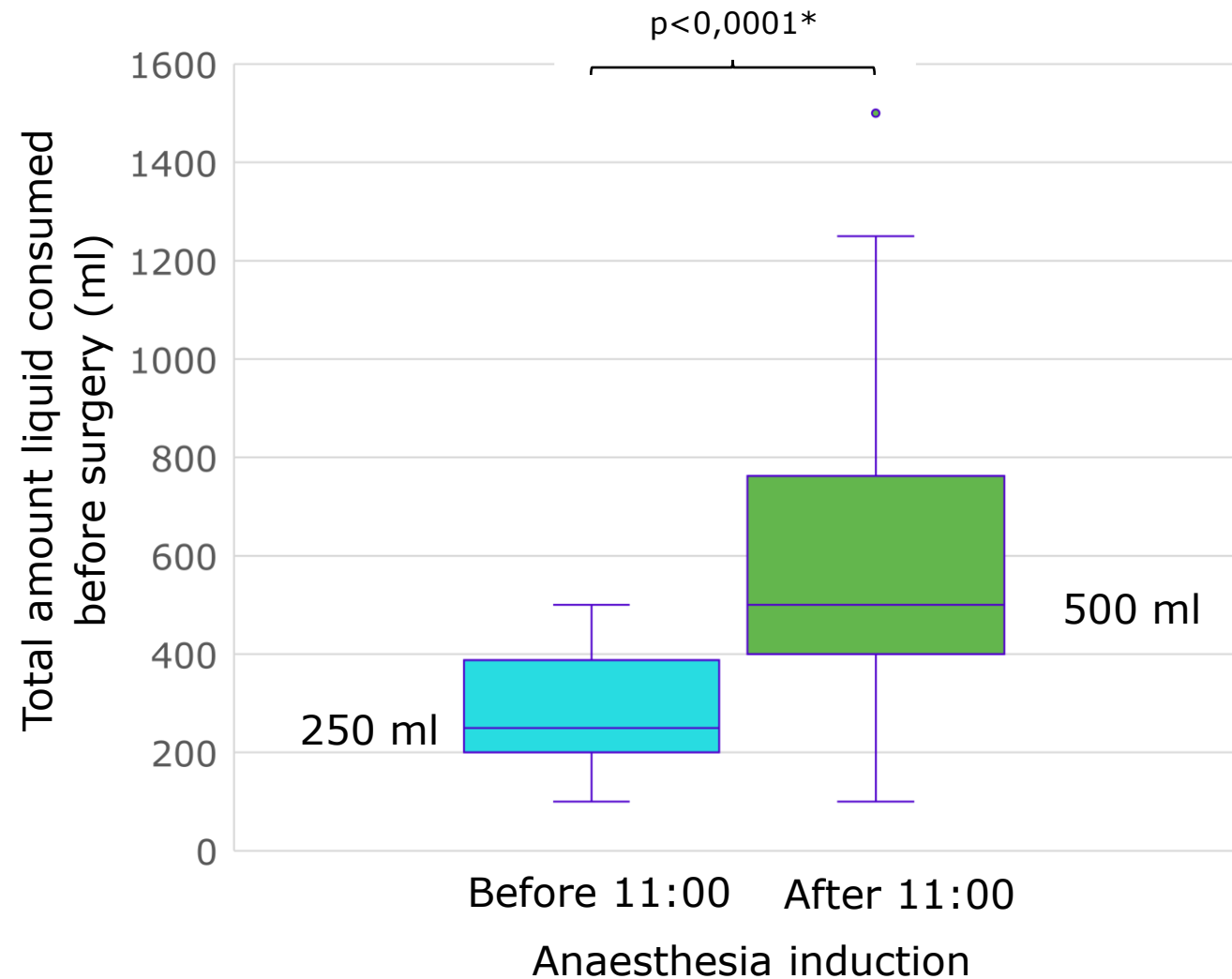
Liquid deprivation less than 2 hours

- Relationship between the time before anaesthesia induction and the amount liquid last consumed (n=70)



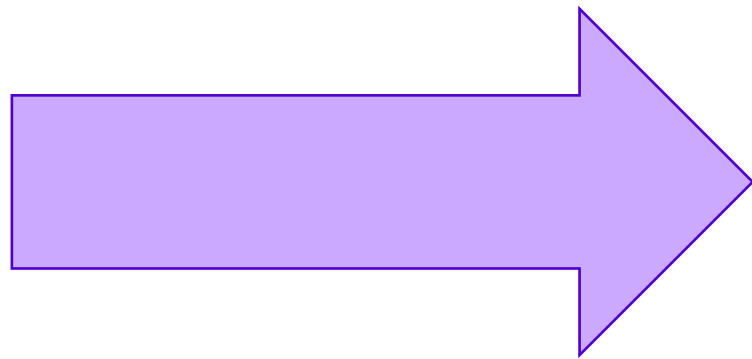
Rüggeberg, Nickel. Anaesthesia 2023, DOI: 10.1111/anae.15997 Online first

Pre-operative cumulative drinking volume



* Mann-Whitney-U-Test Box-Plot with median, whiskers are 1.5 x IQR

Rüggeberg, Nickel. Anaesthesia 2023, DOI: 10.1111/anae.15997 Online first



**What does the
nursing staff say?**

Interviewing surgical ward managers*

Comparison:

Unrestricted drinking before surgery ⇔ 2 hours fasting

	Unrestricted drinking	Equals	2 h fasting
Which approach made patients feel more relaxed while waiting for their operation?	9	2	
In which approach did patients ask more often for an intravenous infusion for fluid replacement ?		2	9
If you were a patient, what would you personally like to be treated according to ?	11		

* Vivantes Klinikum Neukölln, Berlin, 1200 beds, 15 000 anaesthesia services each year

Rüggeberg. 2021 Anästhesist;70:469-475

Unrestricted drinking before surgery



Thank you for your attention