Der adipöse Patient im Fokus der Anästhesie

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Potentielle Interessenskonflikte

Peter Kienbaum berät:

AIR LIQUIDE

ORION PHARMA

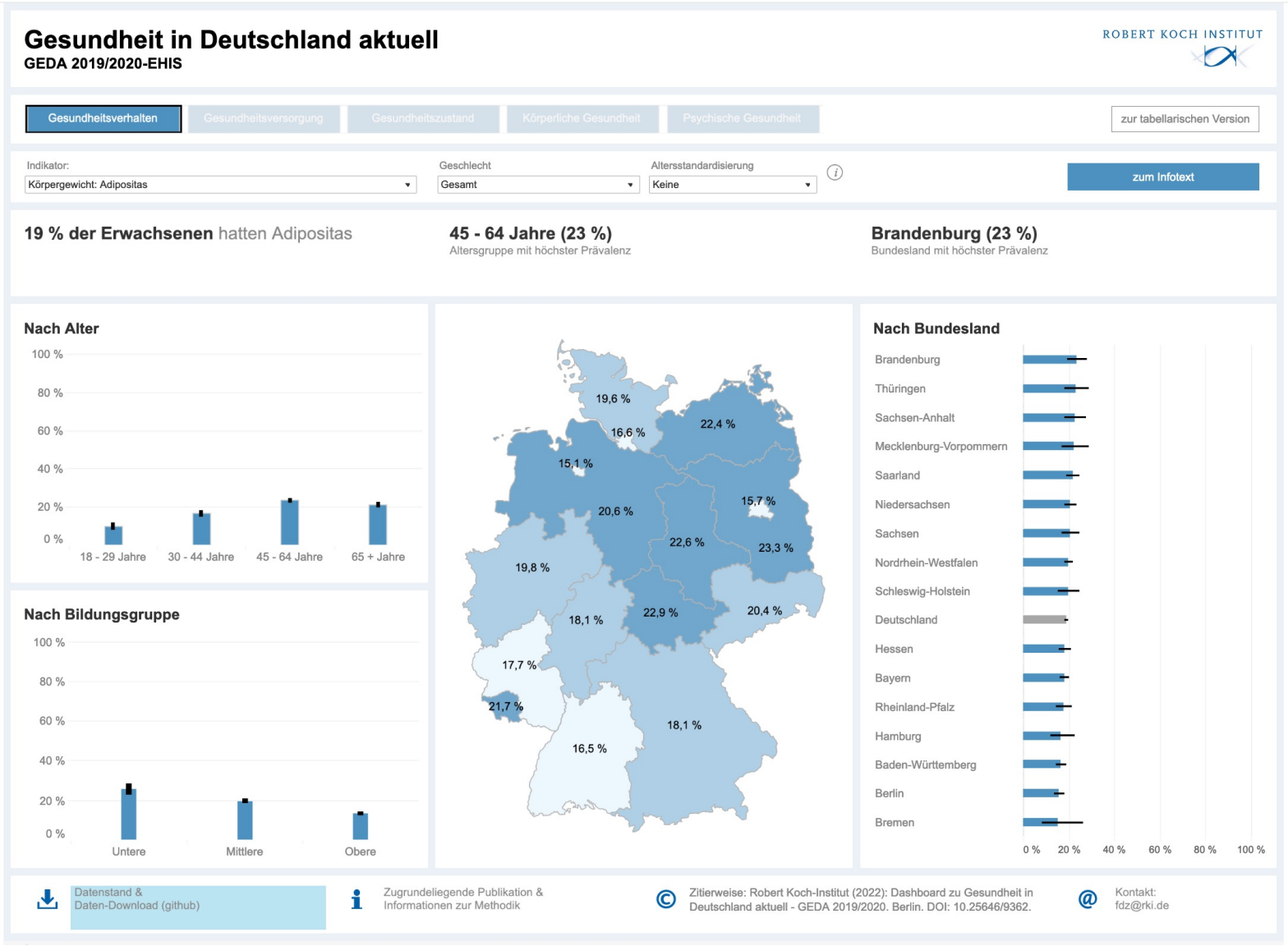
Baxter

TEVA

ratiopharm

- Präoperative Phase
  - Risikoeinschätzung und Anästhesieplanung
- Intraoperative Phase
  - Dosisanpassung
  - Anästhesieeinleitung und Beatmung
  - Ideales Anästhetikum zur Anästhesieaufrechterhaltung
  - PONV
- Postoperative Phase
  - Postoperative Analgesie
  - Aufwachraum vs. IMC-Station

Adipositas: Epidemiologie



Risikoevaluation

Risk factor	Score
(a)	
BMI > 50 kg.m^{-2}	1
Male	1
Age > 45 years	1
Hypertension	1
Risk factors for pulmonary embolism:	1
Previous venous thromboembolism	
Vena caval filter	
Hypoventilation (sleep-disordered breathing)	
Pulmonary hypertension	
	Risk of mortality
(b)	
Class A: 0-1 points	0.2–0.3%
Class B: 2–3 points	1.1–1.5%
Class C: 4–5 points	2.4–3.0%

Nightingale CE et al.: Anaesthesia 2015; 70: 859-76

Universitätsklinikum
Düsseldorf

Adipositas-assoziierte Komorbidität

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Major depression (OR 1·21)
Bipolar disorder (OR 1·47)
Alzheimer's disease (RR 2·04); any dementia (RR 1·64)
Postoperative cognitive dysfunction (RR 1·27)

Hypertension (OR 4·8)
Heart failure (RR 1·90 M; RR 2·12 F)
Ischaemic heart disease (adjusted HR 1·64)
Myocardial infarction (adjusted HR 2·02)
Atrial fibrillation (adjusted HR 1·52 M; adjusted HR 1·46 F)

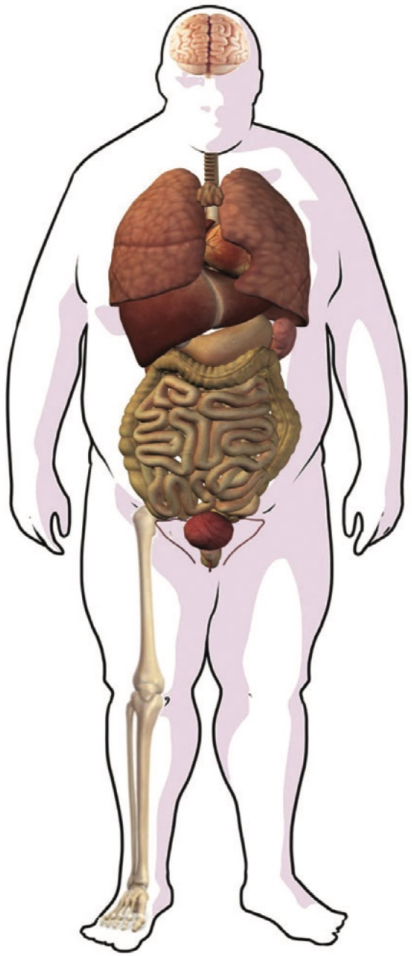
Diabetes mellitus (adjusted RR 7·28)
Dyslipidaemia (adjusted OR 2·2)

Metabolic syndrome
Stroke (OR 2·16)
Myocardial infarction (OR 2·01)
Atrial fibrillation (adjusted HR 1·52 M; adjusted HR 1·46 F)

Hypercoagulability
Stroke, myocardial infarction (OR 1·57)
Deep venous thrombosis (RR 2·50)
Pulmonary embolism (RR 2·21)

Non-alcoholic steatohepatitis (RR 4·6); cirrhosis (RR 4·1)

Renal disease (OR 1·38 hypertension; OR 1·4 type 2 diabetes)



Obstructive sleep apnoea (OR 6·0 for ↑10% bodyweight)
DMV (OR 3·39), DEI (OR 3·46) or both (OR 4·12)
Postoperative desaturation (OR 2·27)
Postoperative respiratory failure (OR 2·43)
Postoperative reintubation (OR 2·05)
Postoperative cardiac adverse events (OR 2·07)
Postoperative ICU transfer (OR 2·81)

Obesity hypoventilation syndrome
Cardiac event or cor pulmonale (OR 9)
Postoperative respiratory failure (OR 10·9)
Postoperative heart failure (OR 5·4)
Postoperative prolonged intubation (OR 3·1)
Postoperative ICU transfer (OR 10·9)

Respiratory disease
Respiratory complications with severe ↓FEV1 (OR 2·97)
Cardiovascular complications with severe ↓FEV1 (OR 2·02)

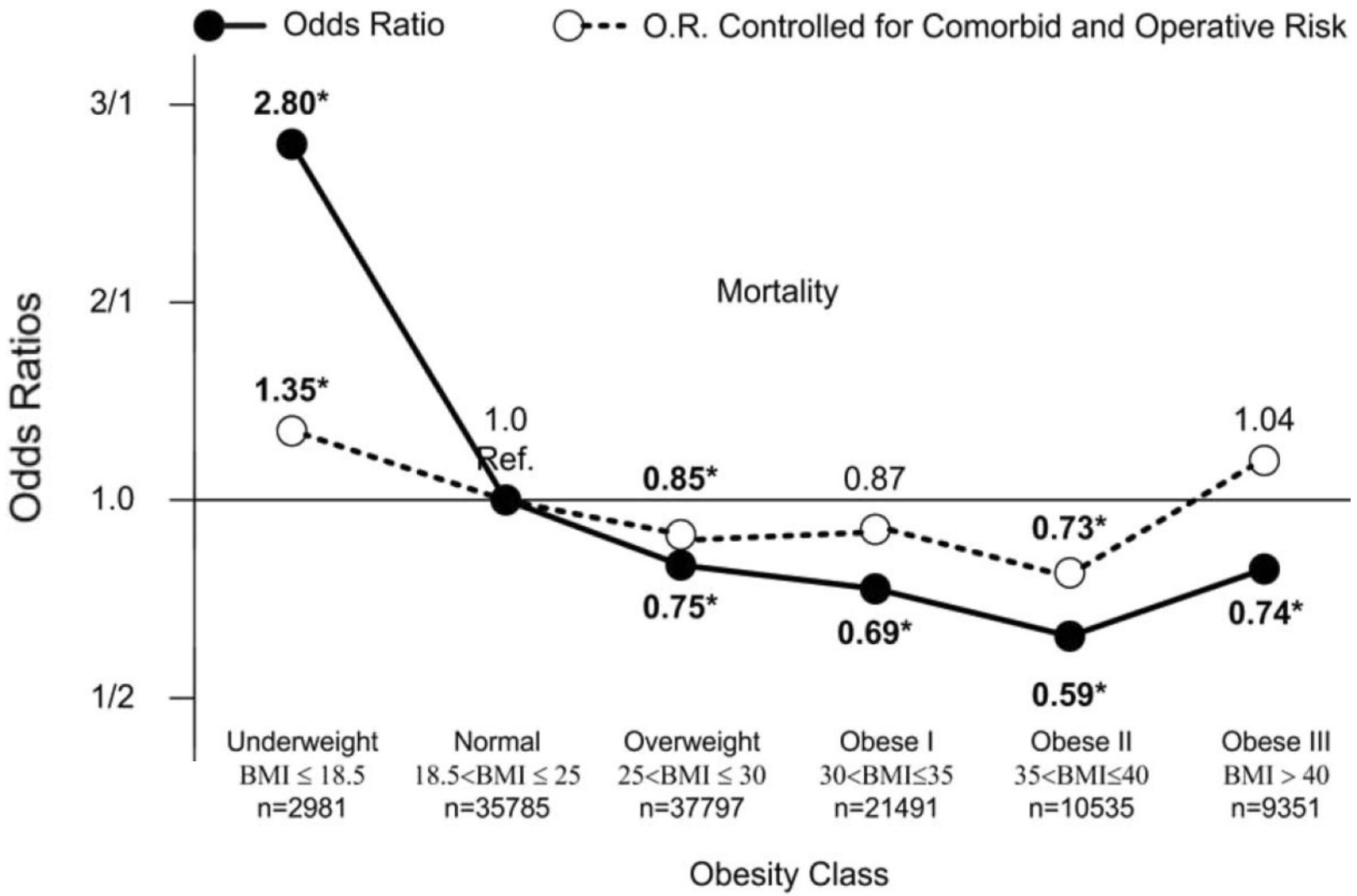
Asthma (RR 2·7)
Postoperative respiratory complications (OR 2·94)

Gastro-oesophageal reflux disease (OR 1·94)
Postoperative complications (OR 10·9)

Osteoarthritis (RR 1·12 hip; RR 1·25 knee)
Gout (RR 2·67)

Carron M et al.: Br J Surg 2020; 107: e39-e55

Sterblichkeit: „Obesity Paradoxon“



Mullen JT et al.: Ann Surg 2009; 250: 166-72

- Präoperative Phase
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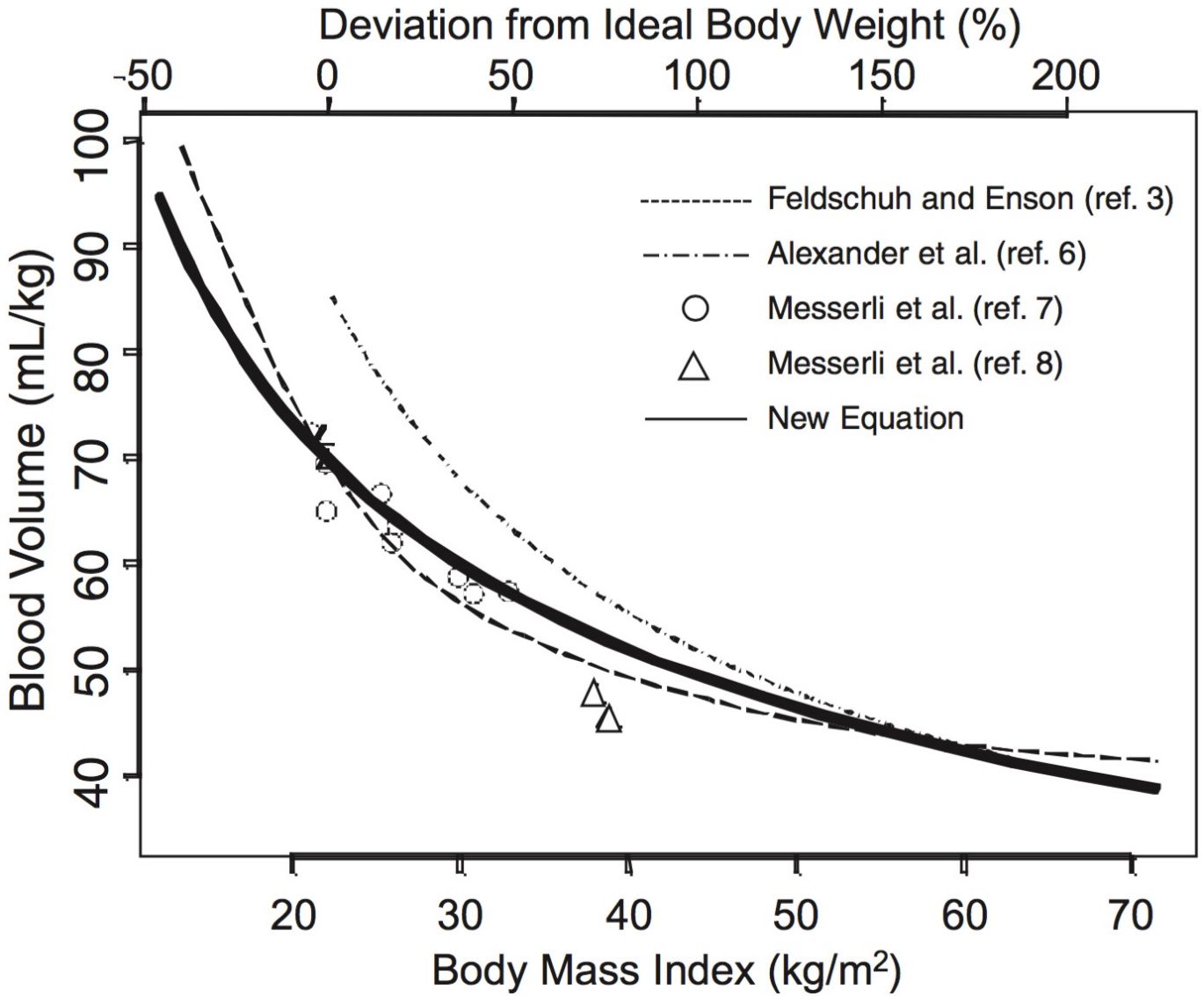
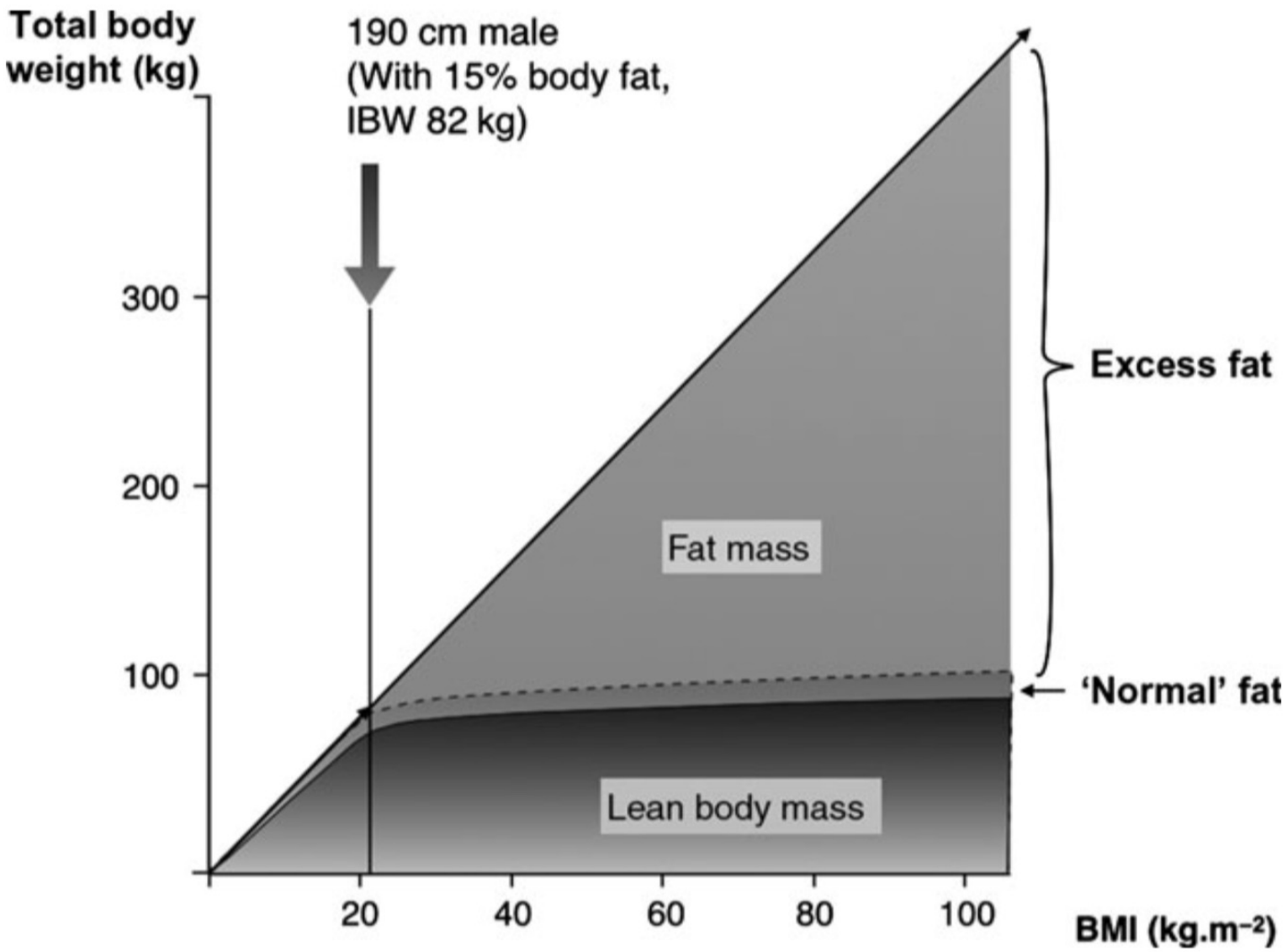
Blutvolumen



Lemmens HJM et al.: Obesity Surgery 2006; 16: 773-6

TBW vs. LBM



Nightingale CE et al.: Anaesthesia 2015; 70: 859-76

Dosisanpassung

Lean body weight*	Adjusted body weight*
Propofol (induction)	Propofol (infusion)
Thiopental	Antibiotics
Fentanyl	Low molecular weight heparin
Rocuronium	Alfentanil
Atracurium	Neostigmine (maximum 5 mg)
Vecuronium	Sugammadex†
Morphine	
Paracetamol	$IBW_{Devine} + 0.4\ (TBW - IBW)$
Bupivacaine	
Lidocaine	

Men: $9270 \times TBW/(6680 + 216 \times BMI)$

Women: $9270 \times TBW/(8780 + 244 \times BMI)$

Beispiel PK (180 cm)

TBW	**98**	**150**
BMI	30	44
LBW	69	79
ABW	**84**	**105**

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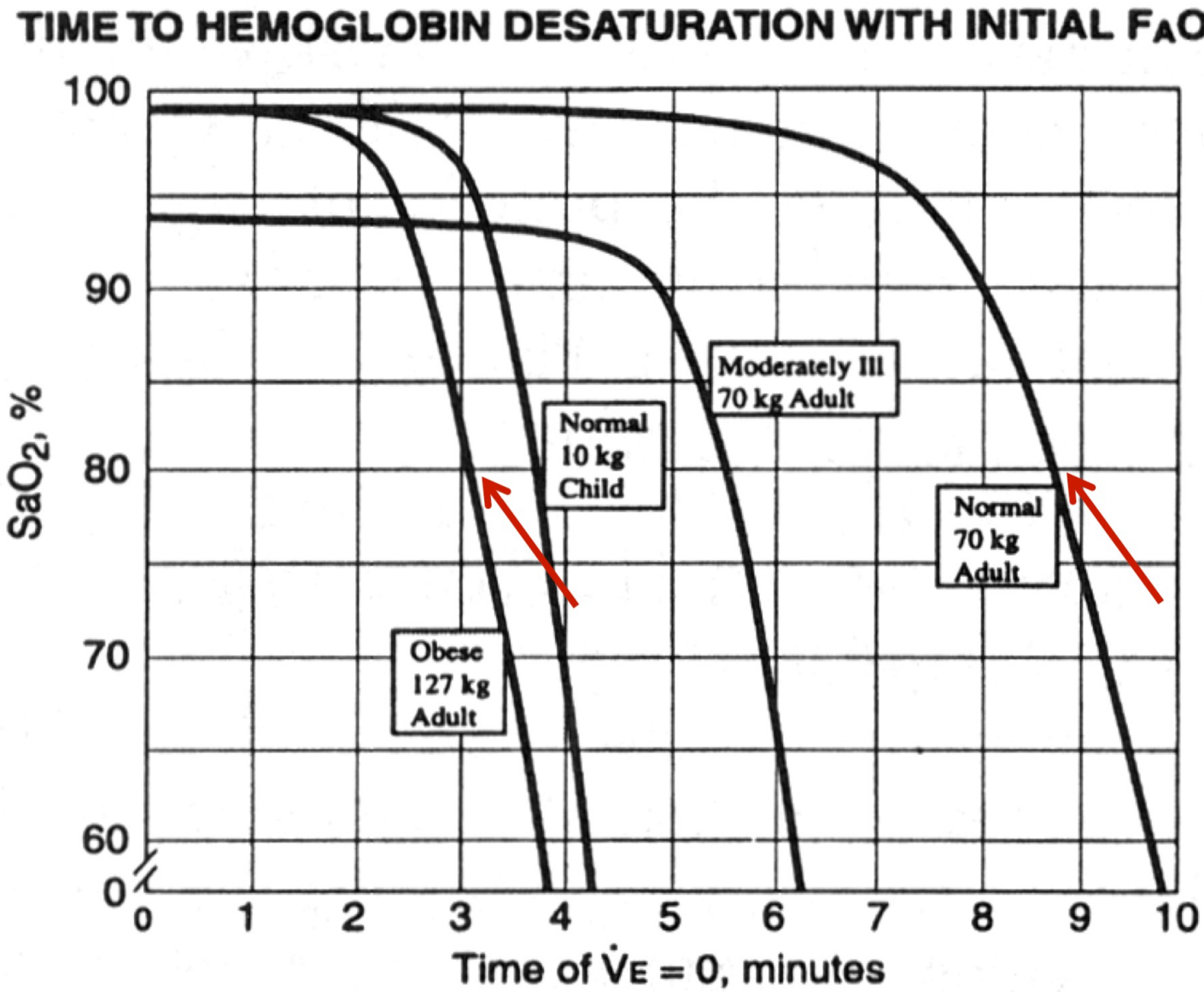
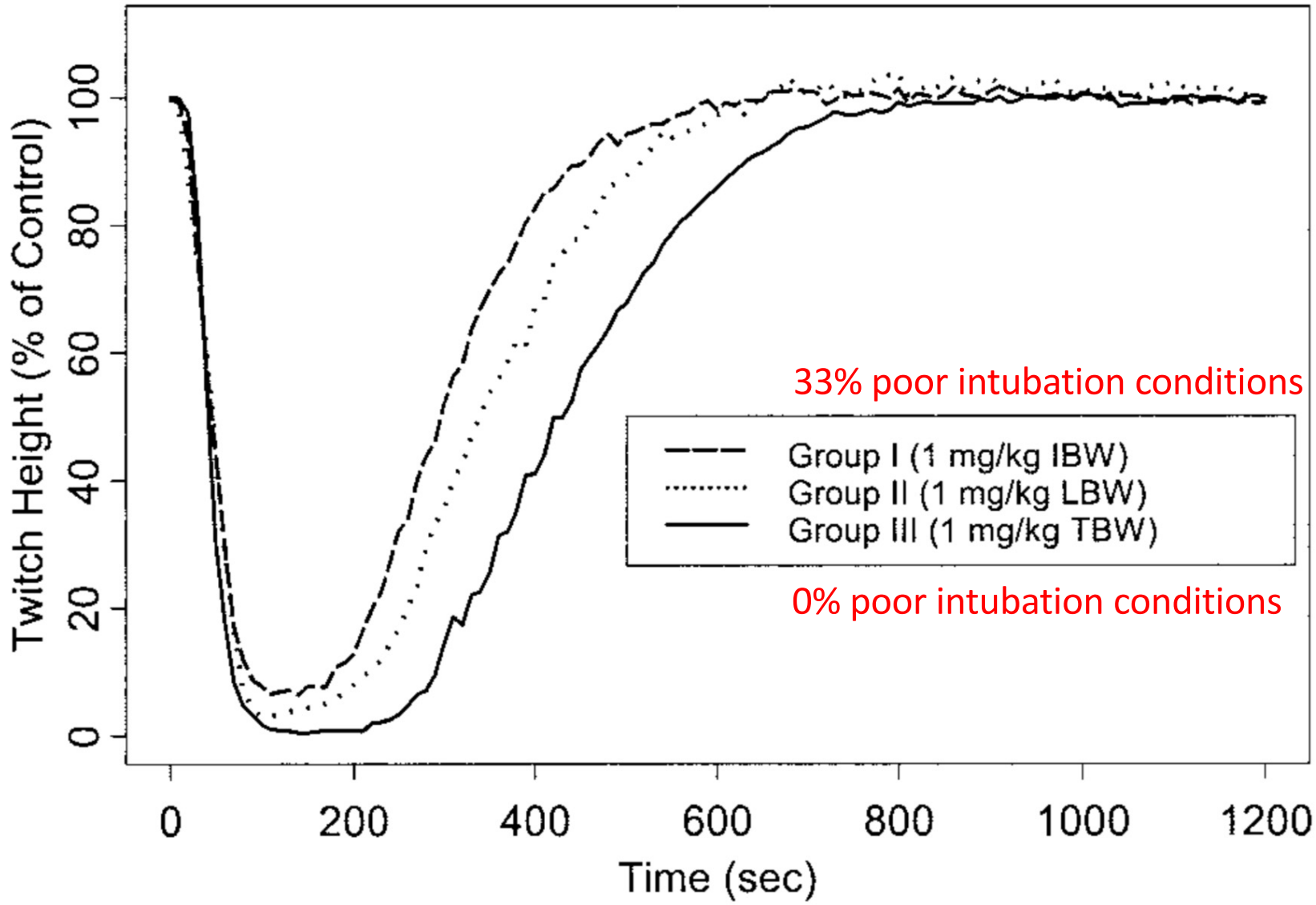
Apnoetoleranz



Farmery AD, Roe PG: Br J Anaesth 1996; 76: 284-91

Succinylcholin: Dosierung



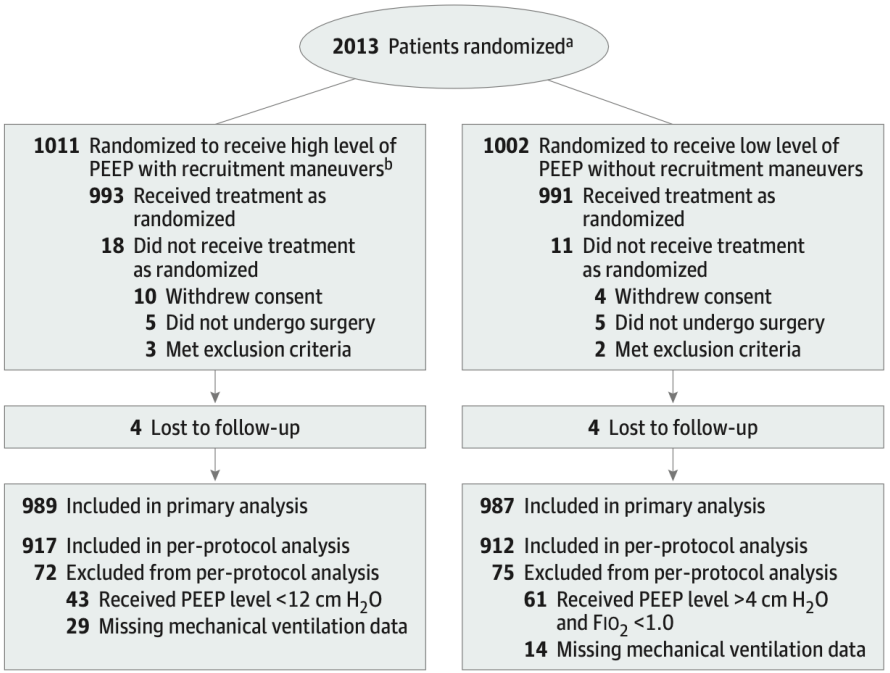
Lemmens HJ & Brodsky JB: Anesth Analg 2006; 102: 438-42

JAMA | Original Investigation | CARING FOR THE CRITICALLY ILL PATIENT

Effect of Intraoperative High Positive End-Expiratory Pressure (PEEP) With Recruitment Maneuvers vs Low PEEP on Postoperative Pulmonary Complications in Obese Patients

A Randomized Clinical Trial

Writing Committee for the PROBESE Collaborative Group of the PROtective VEntilation Network (PROVEnet) for the Clinical Trial Network of the European Society of Anaesthesiology



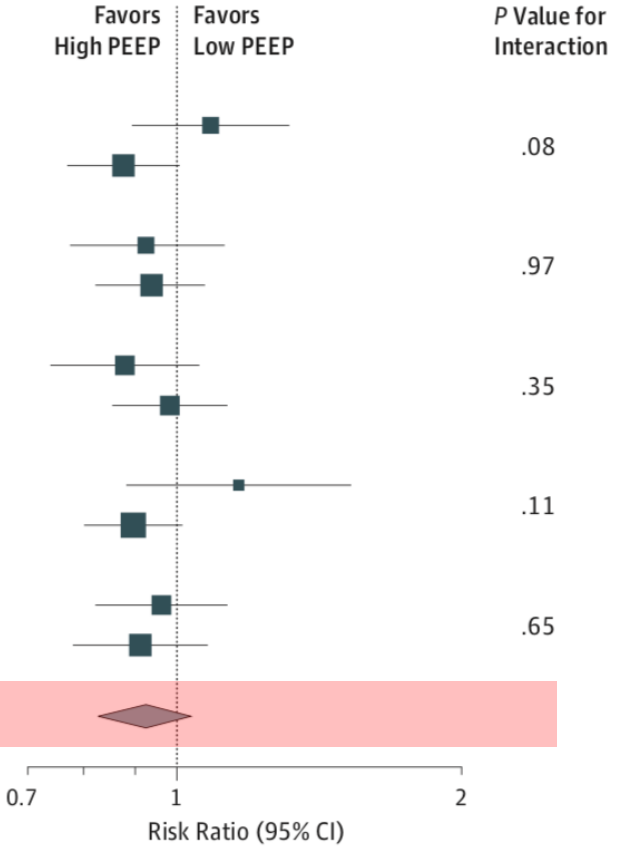
BMI > 35 kg m^{-2}

Tidal Volume: 7 ml kg^{-1} predicted body weight (IBW)
High PEEP: 12 cm H_2O + recruitment (n=989)
Low PEEP: 4 cm H_2O (n=987)

Primary outcome: PPCs within 5 postoperative days

Beatmung – High PEEP vs. Low PEEP

Subgroups of Patients	High PEEP No. With PPC	High PEEP Total No.	Low PEEP No. With PPC	Low PEEP Total No.	Risk Ratio (95% CI)	*P* Value for Interaction
Type of surgery						
Nonlaparoscopic	79	240	74	253	1.09 (0.90-1.32)	.08
Laparoscopic	130	740	156	727	0.88 (0.77-1.01)	
Body mass index[a]						
<40	76	336	94	376	0.93 (0.77-1.13)	.97
≥40	135	653	139	611	0.94 (0.82-1.08)	
Peripheral oxygen saturation, %						
<96	88	317	112	342	0.88 (0.74-1.06)	.35
≥96	123	672	121	645	0.99 (0.86-1.13)	
Type of incision						
Peripheral	32	126	25	126	1.16 (0.89-1.53)	.11
Upper abdominal	179	863	208	861	0.90 (0.80-1.02)	
Waist-to-hip ratio, cm						
<1.0	97	467	100	457	0.97 (0.83-1.13)	.65
≥1.0	98	447	112	449	0.92 (0.78-1.08)	
All patients	211	989	233	987	0.93 (0.83-1.04)	



Beatmung – High PEEP vs. Low PEEP

	No. of Events (%)				
	High Level of PEEP (n = 989)[a]	Low Level of PEEP (n = 987)[a]	Absolute Difference (95% CI), %	Risk Ratio (95% CI)[b]	*P* Value[c]
Post Hoc Outcomes					
Intraoperative adverse events					
Rescue strategy for desaturation	59 (6.0)	166 (16.8)	−10.8 (−13.6 to −8.1)	0.49 (0.39 to 0.62)	<.001
Need for vasoactive drugs	491 (49.6)	439 (44.5)	5.2 (0.8 to 9.6)	1.10 (1.01 to 1.21)	.02
Mortality at 5 d	5 (0.5)	3 (0.3)	0.2 (−0.3 to 0.8)	HR, 1.67 (0.40 to 6.97)[l]	.48

eTable 2. Rescue strategies for intraoperative hypoxemia

	Lower PEEP			Higher PEEP		
Step	**FiO_2**	**PEEP [cmH_2O]**		**FiO_2**	**PEEP [cmH_2O]**	
1	0.5	4		0.4	14	(+RM)
2	0.6	4		0.4	16	(+RM)
3	0.7	4		0.4	18	(+RM)
4	0.8	4		0.5	18	
5	0.9	4		0.6	18	
6	1.0	4		0.7	18	
7	1.0	5		0.8	18	
8	1.0	6		0.9	18	
9	1.0	7	(+RM)	1.0	18	
10				1.0	20	(+RM)

Legend: If intraoperative hypoxemia, defined as oxygen saturation ≤ 92%, develops, sequences of interventions will be used according to group assignment. FiO_2, inspiratory fraction of oxygen; PEEP, positive end-expiratory airway pressure; RM, lung recruitment maneuver

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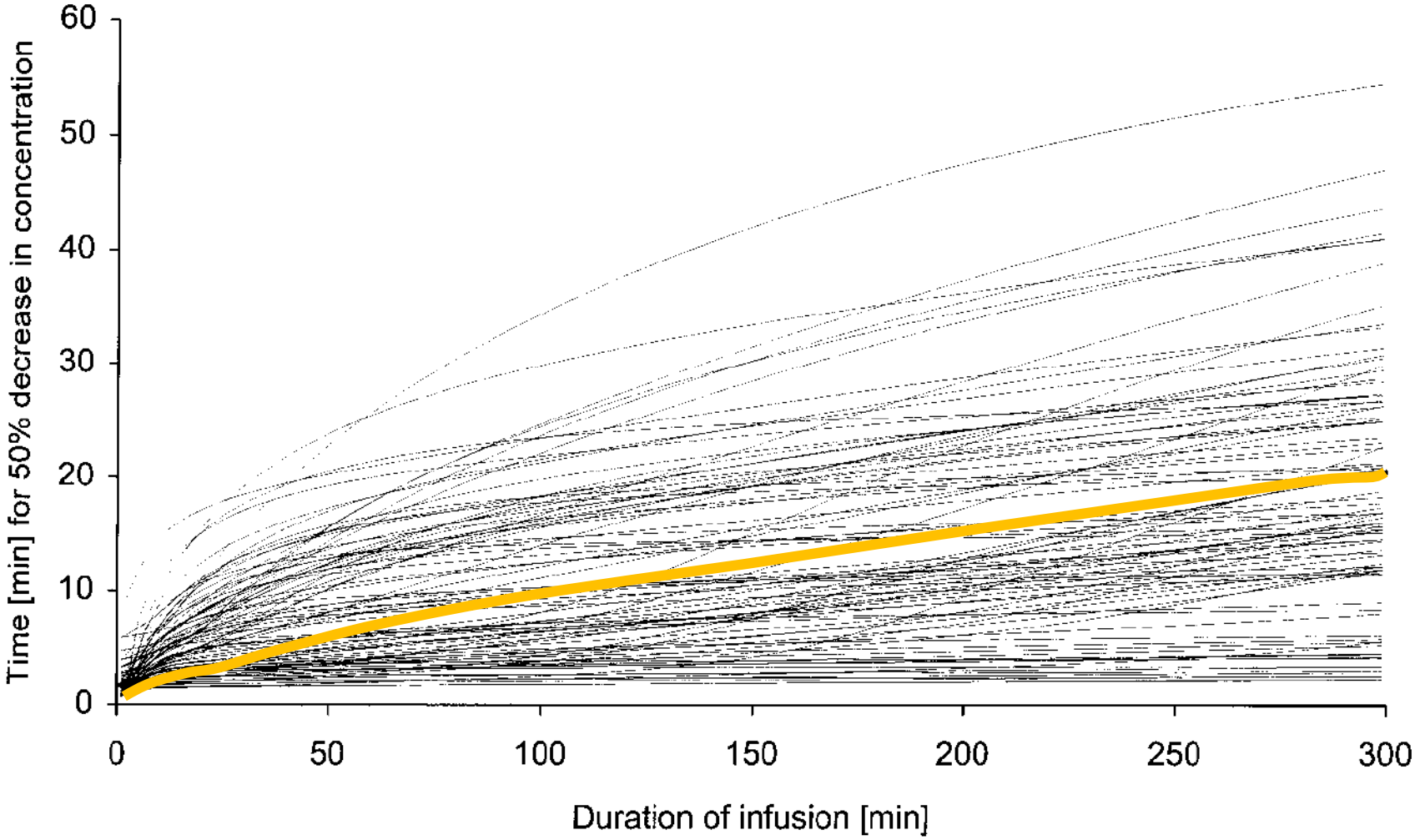
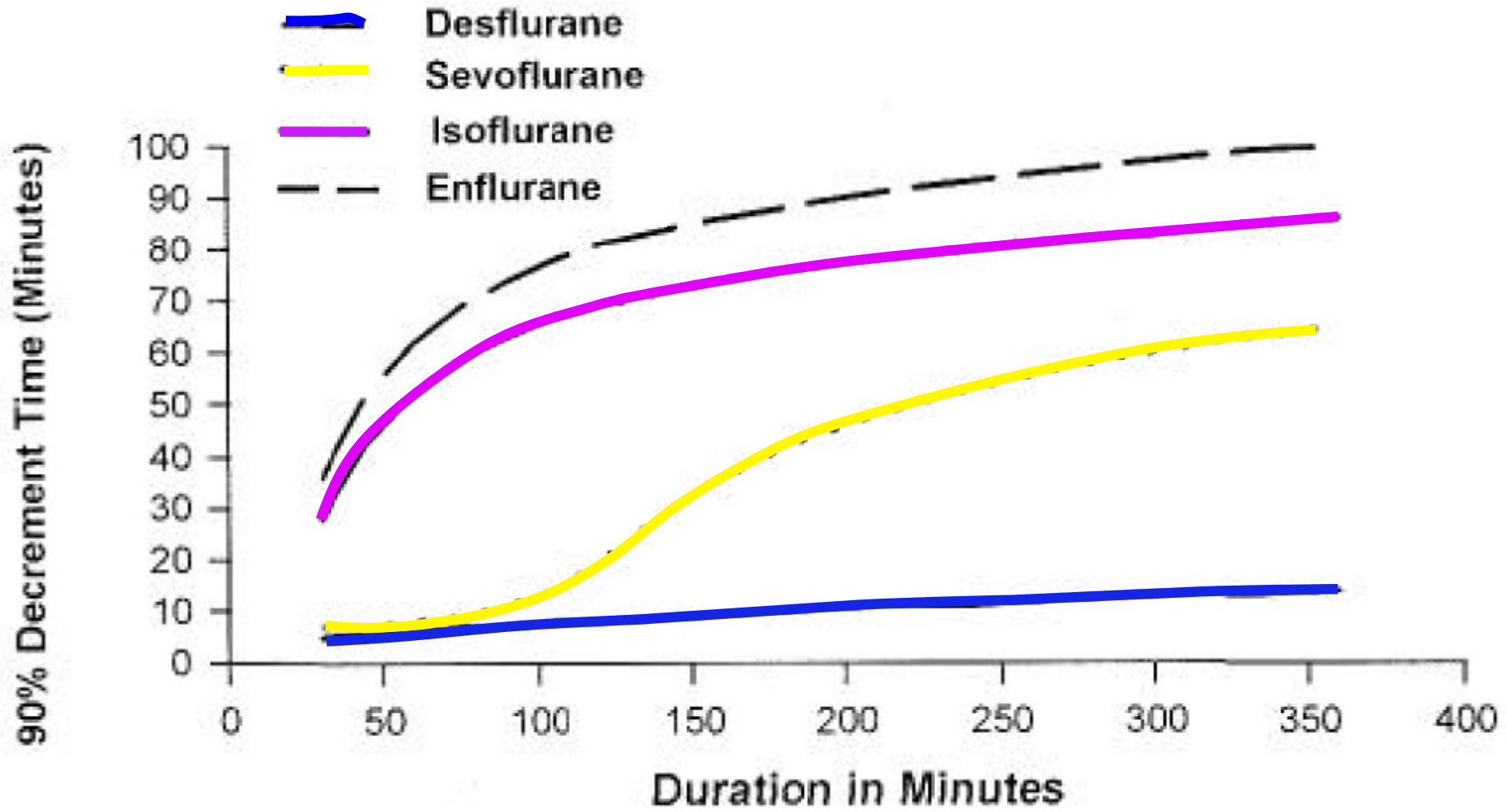
Propofol: Kontextsensitive HWZ



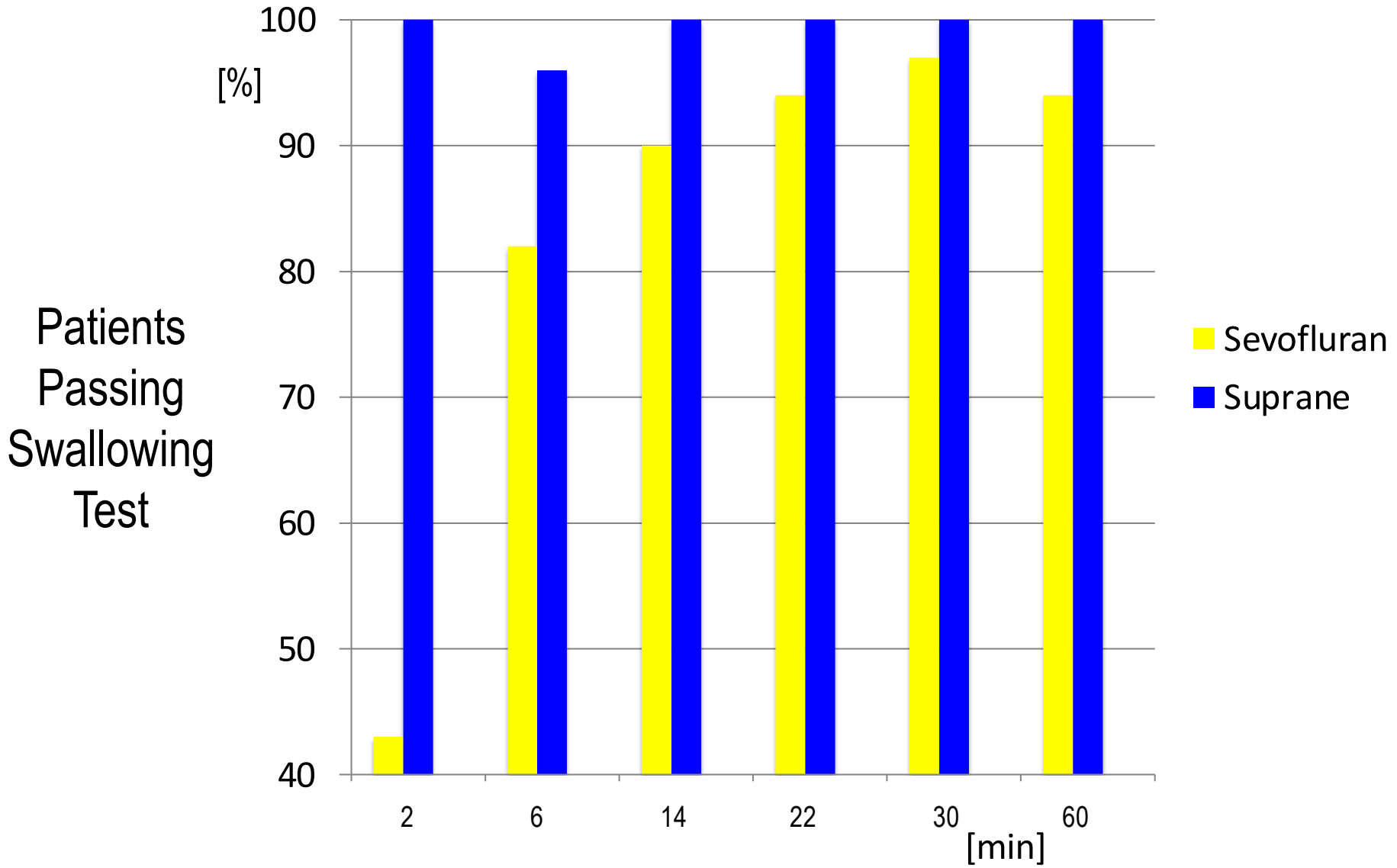
Schüttler J, Ihmsen H: Anesthesiology 2000; 92: 727-38

IAs: Terminale Elimination



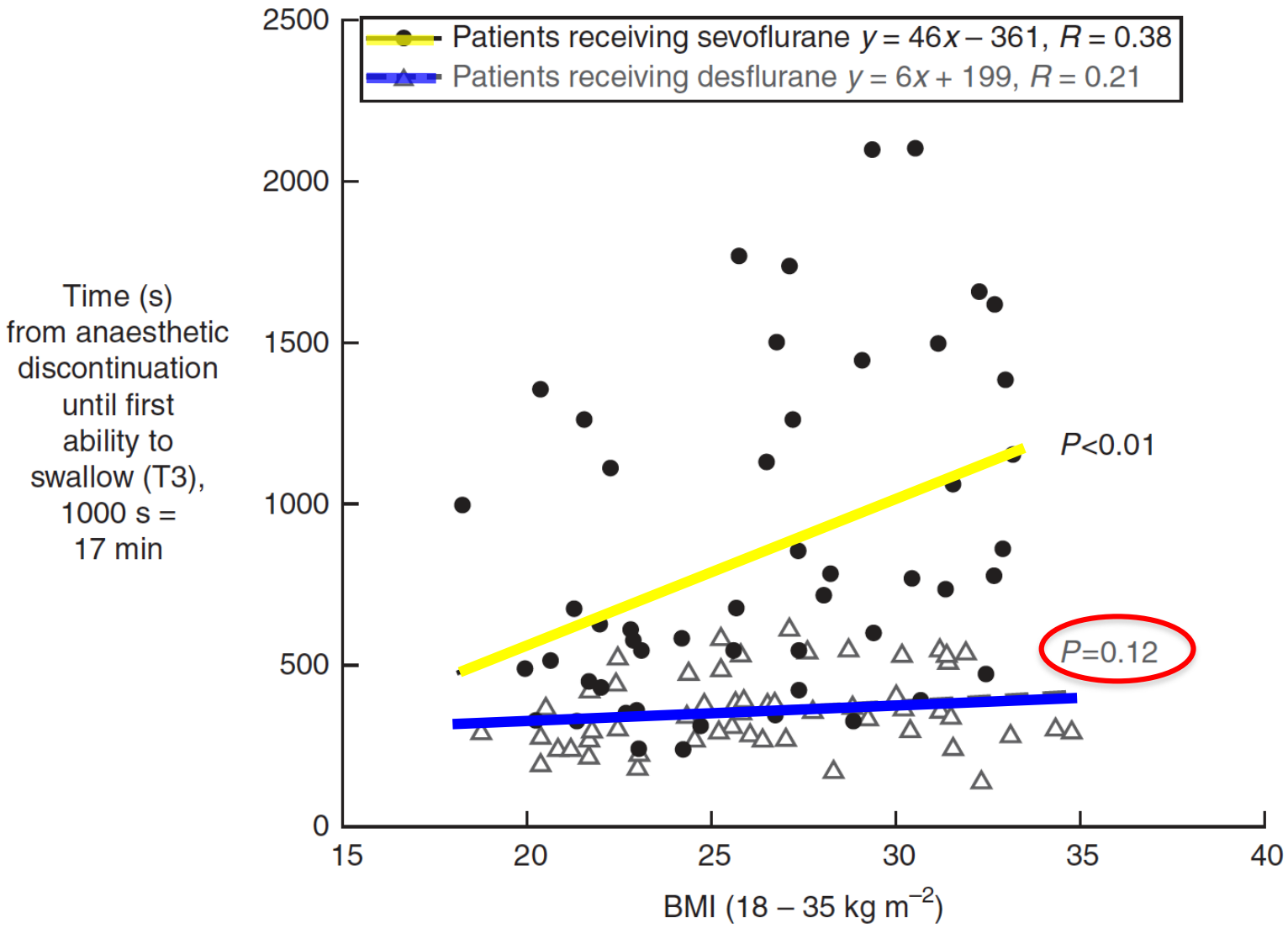
Bailey JM: Anesth Analg 1997; 85: 681-6

IAs: Suprane vs. Sevofluran

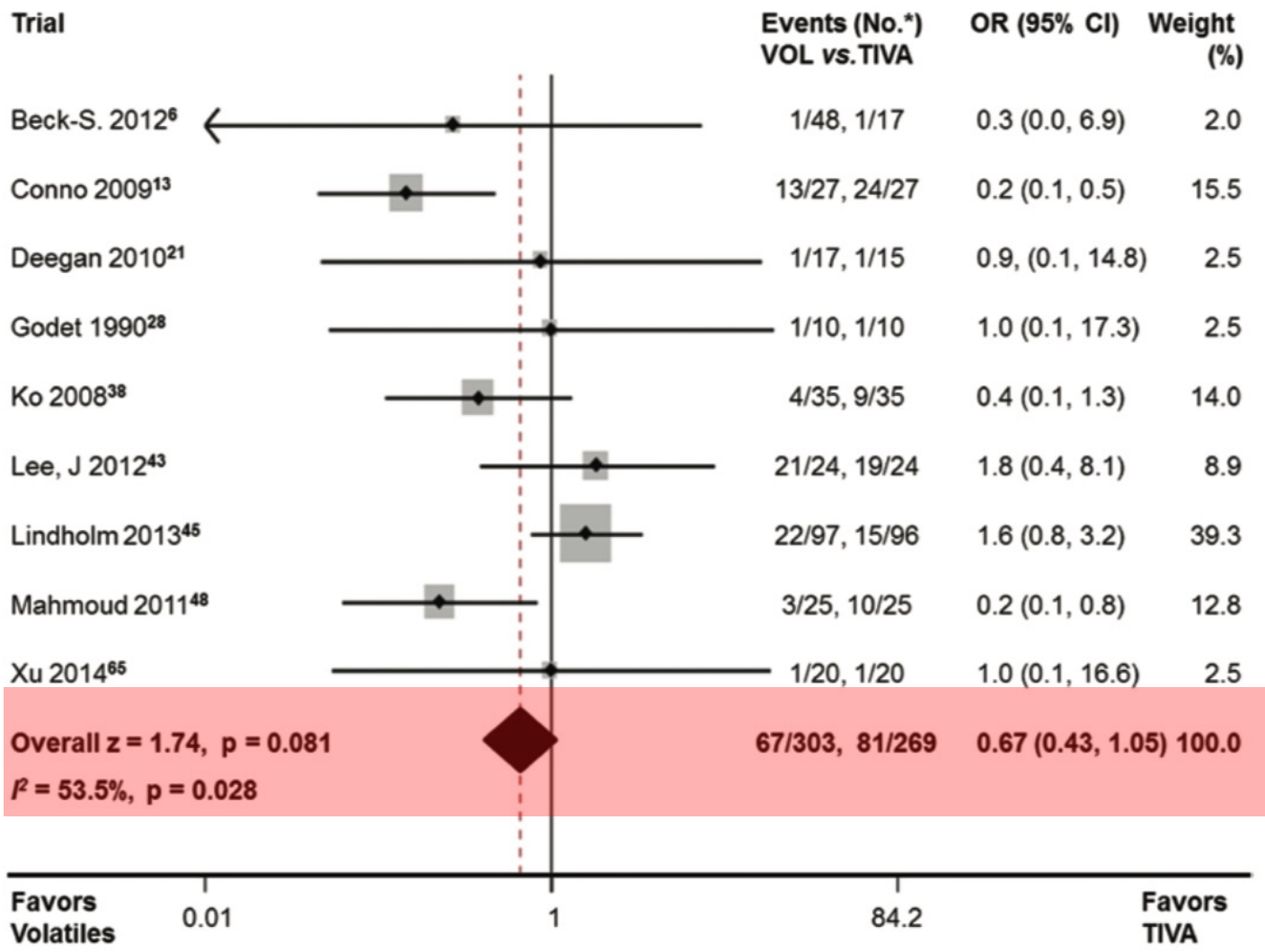


McKay RE et al.: Anesth Analg 2016; 122: 393-401

Body Mass Index and Recovery



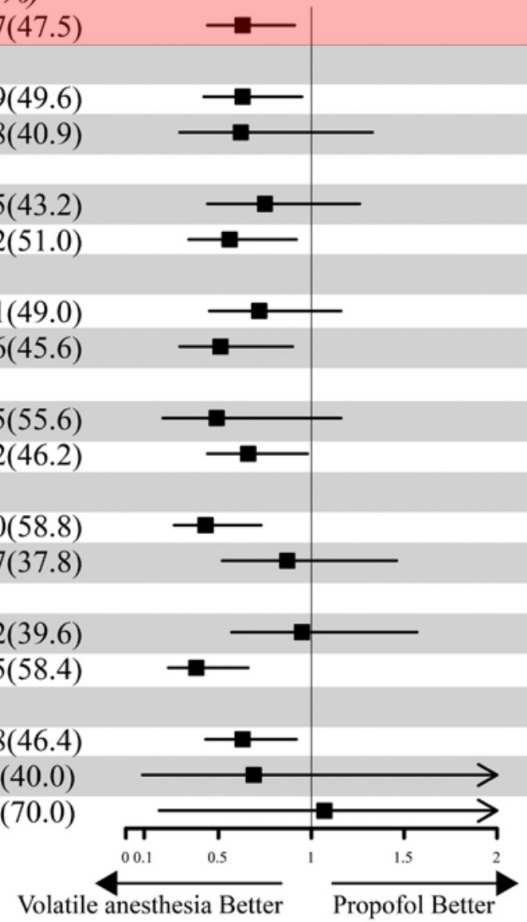
Postop Pulmonale Komplikationen



Uhlig C et al.: Anesthesiology 2016; 124: 1230-45

Postop Pulmonale Komplikationen

Subgroup	No. of Patients	Violatile anesthetics	Propofol	Odds Ratio (95% CI)	P value for interaction
		no of events (%)			
Overall	553	135(36.5)	87(47.5)	0.63 (0.44–0.91)	
Sex					0.971
Male	429	111(38.3)	69(49.6)	0.63 (0.42–0.95)	
Female	124	24(30.0)	18(40.9)	0.62 (0.29–1.33)	
Age					0.429
< 65	285	74(36.3)	35(43.2)	0.75 (0.44–1.26)	
≥ 65	268	61(36.7)	52(51.0)	0.56 (0.34–0.92)	
Smoking history					0.361
Smoker	321	89(41.0)	51(49.0)	0.72 (0.45–1.16)	
Nonsmoker	232	46(30.1)	36(45.6)	0.51 (0.29–0.90)	
Intubation strategy					0.534
Double–lumen tube	117	34(37.8)	15(55.6)	0.49 (0.20,1.16)	
Single–lumen tube	436	101(36.1)	72(46.2)	0.66 (0.44–0.98)	
Total fluids					0.060
< Median (8.23 mL/kg/h)	276	73(38.2)	50(58.8)	0.43 (0.26–0.73)	
≥ Median	277	62(34.6)	37(37.8)	0.87 (0.52–1.46)	
Surgery time					0.016
< Median (280 min)	265	61(38.4)	42(39.6)	0.95 (0.57–1.57)	
≥ Median	288	74(35.1)	45(58.4)	0.38 (0.23–0.66)	
Surgical procedure					0.847
Mckeown	505	119(35.3)	78(46.4)	0.63 (0.43–0.92)	
Ivor Lewis	24	6(31.6)	2(40.0)	0.69 (0.09–5.29)	
SPIMSLE	24	10(71.4)	7(70.0)	1.07 (0.18–6.36)	



Zhang YT et al.: Anesth Analg 2023; epub

Postop Pulmonale Komplikationen

Variables	Sevoflurane group (n = 185)	Desflurane group (n = 185)	Propofol group (n = 183)	Pairwise Comparisons		
				S versus P Odds ratio (98.3% CI) *P*-value	D versus P Odds ratio (98.3% CI) *P*-value	D versus S Odds ratio (98.3% CI) *P*-value
Primary outcome						
PPCs	76 (41.1)	59 (31.9)	87 (47.5)	0.77 (0.47–1.27) .212[a]	0.52 (0.31–0.87) .002[a]	0.67 (0.40–1.13) .066[a]
Respiratory infection	67 (36.2)	44 (23.8)	71 (38.8)	0.90 (0.54–1.50) .609[a]	0.49 (0.28–0.85) .002[a]	0.55 (0.32–0.95) .009[a]
Pleural effusion	13 (7.0)	12 (6.5)	19 (10.4)	0.65 (0.27–1.60) .253[a]	0.60 (0.24–1.50) .178[a]	0.92 (0.34–2.47) 0.836[a]
Pneumothorax	2 (1.1)	2 (1.1)	3 (1.6)	0.66 (0.07–5.88) .684[b]	0.66 (0.07–5.88) .684[b]	1.00 (0.09–11.02) 1.000[b]
Atelectasis	14 (7.6)	13 (7.0)	16 (8.7)	0.86 (0.34–2.13) .680[a]	0.79 (0.31–2.00) .541[a]	0.92 (0.36–2.40) .842[a]
Respiratory failure	6 (3.2)	2 (1.1)	4 (2.2)	1.50 (0.32–7.15) 0.751[b]	0.49 (0.06–3.92) .447[b]	0.33 (0.05–2.33) .284[b]
Bronchospasm	0	4 (2.2)	0	-	- .123[b]	- .123[b]
Pulmonary embolism	0	0	1 (0.5)	- .497[b]	- .497[b]	-
Aspiration pneumonitis	0	0	0	-	-	-

Zhang YT et al.: Anesth Analg 2023; epub

Opioid-freie Anästhesie

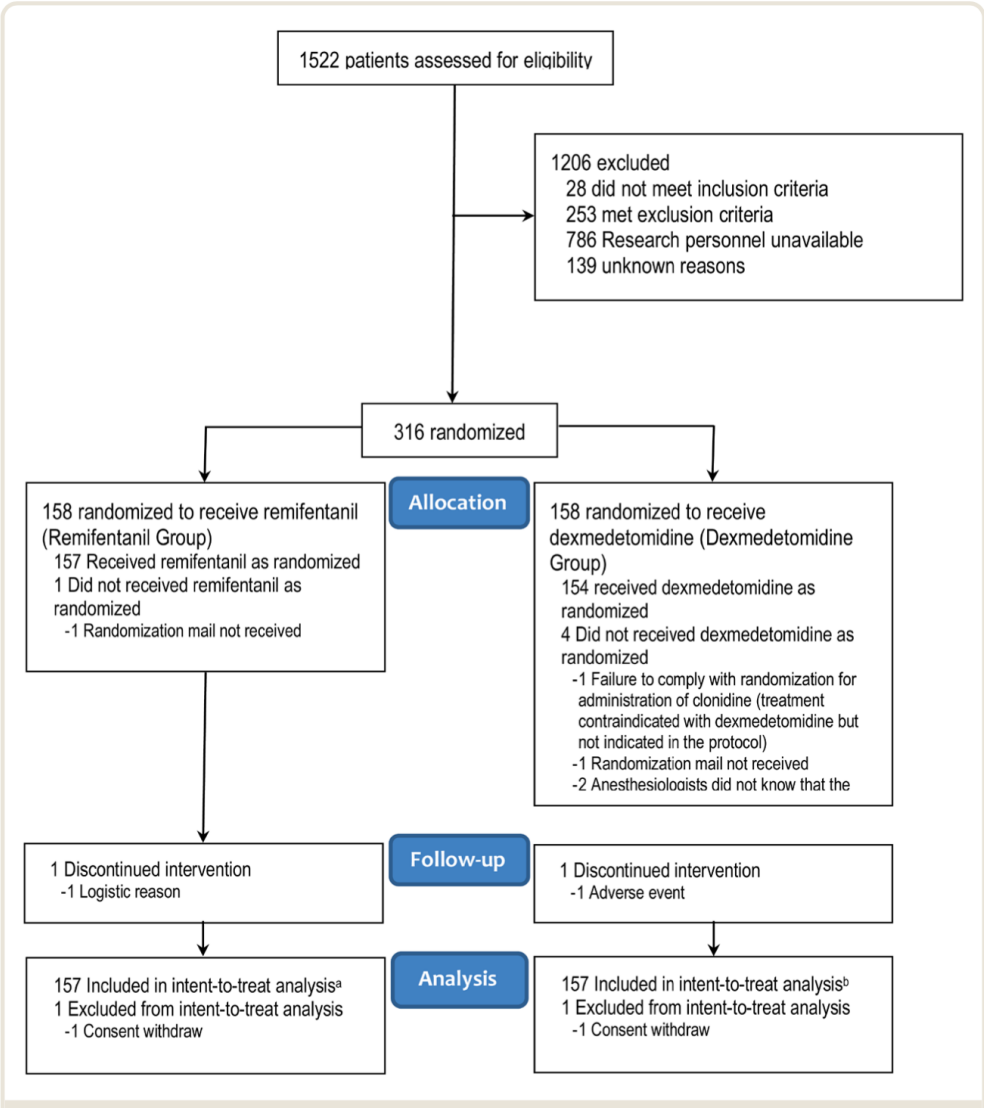
ANESTHESIOLOGY

Balanced Opioid-free Anesthesia with Dexmedetomidine *versus* Balanced Anesthesia with Remifentanil for Major or Intermediate Noncardiac Surgery

The Postoperative and Opioid-free Anesthesia (POFA) Randomized Clinical Trial

Helene Beloeil, M.D., Ph.D., Matthias Garot, M.D., Gilles Lebuffe, M.D., Ph.D., Alexandre Gerbaud, M.D., Julien Bila, M.D., Philippe Cuvillon, M.D., Ph.D., Elisabeth Dubout, M.D., Sebastien Oger, M.D., Julien Nadaud, M.D., Antoine Becret, M.D., Nicolas Coullier, M.D., Sylvain Lecoeur, M.D., Julie Fayon, M.D., Thomas Godet, M.D., Michel Mazerolles, M.D., Fouad Atallah, M.D., Stephanie Sigaut, M.D., Pierre-Marie Choinier, M.D., Karim Asehnoune, M.D., Ph.D., Antoine Roquilly, M.D., Ph.D., Gerald Chanques, M.D., Ph.D., Maxime Esvan, Ms.C., Emmanuel Futier, M.D., Ph.D., Bruno Laviolle, M.D., Ph.D., for the POFA Study Group* and the SFAR Research Network†

ANESTHESIOLOGY 2021; 134:541–51



Beloeil H et al.: Anesthesiology 2021; 134: 541-51

Opioid-freie Anästhesie

Variable	Remifentanil Group (N = 157)	Dexmedetomidine Group (N = 157)	Risk Difference (95% CI)	*P* Value
Composite primary endpoint	105 (67%)	122 (78%)	11 (1 to 20)	0.031
Postoperative hypoxemia	94 (61%)	110 (72%)	12 (1 to 22)	0.030
Postoperative ileus	28 (18%)	33 (22%)	4 (–6 to 13)	0.473
Cognitive dysfunction	0 (0%)	2 (1%)	1 (–1 to 3)	0.498

Outcome	Remifentanil Group	Dexmedetomidine Group	Mean/Median/Risk Difference (95% CI)	*P* Value
Morphine consumption, mg*	11(5 to 21)	6 (0 to 17)	–3.3 (–5.7 to –0.8)†	0.002
Number of episodes with numerical rate scale ≥ 3‡	2 (1 to 3)	2 (1 to 3)	0 (0 to 0)†	0.618
Time for extubation, h§	0:40 ± 1:28	1:09 ± 1:45	0:29 (0:07 to 0:51)‖	0.009
Duration of PACU stay, h#	1:53 ± 1:47	2:28 ± 2:11	0:35 (0:09 to 1:02)‖	0.010
Unplanned admission‡	0 (0)	1 (0)	0 (0 to 0)**	1.000
Postoperative nausea and vomiting‡	58 (37)	37 (24)	–13 (–23 to –3)**	0.010
Use of rescue antiemetic drugs‡	41 (26)	21 (13)	–13 (–21 to –4)**	0.005
Duration of hospital stay, days‡	5.1 ± 4.5	5.4 ± 5.6	0.2 (–0.9 to 1.4)‖	0.664
Adverse events	n = 157	n = 157		
Hypertension	117 (75)	125 (80)	5 (–4 to 14)**	0.283
Hypotension	94 (60)	97 (62)	2 (–9 to 13)**	0.728
Bradycardia	14 (9)	30 (19)	10 (3 to 18)**	0.009
Bradycardia with heart rate < 45 beats/min	9 (6)	25 (16)	10 (3 to 17)**	0.004
Other severe unexpected events	5 (3)	5 (3)	0 (–4 to 4)**	1.000

Beloeil H et al.: Anesthesiology 2021; 134: 541-51

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EJA

Eur J Anaesthesiol 2016; **33:**750–760

ORIGINAL ARTICLE

Total intravenous anaesthesia versus single-drug pharmacological antiemetic prophylaxis in adults

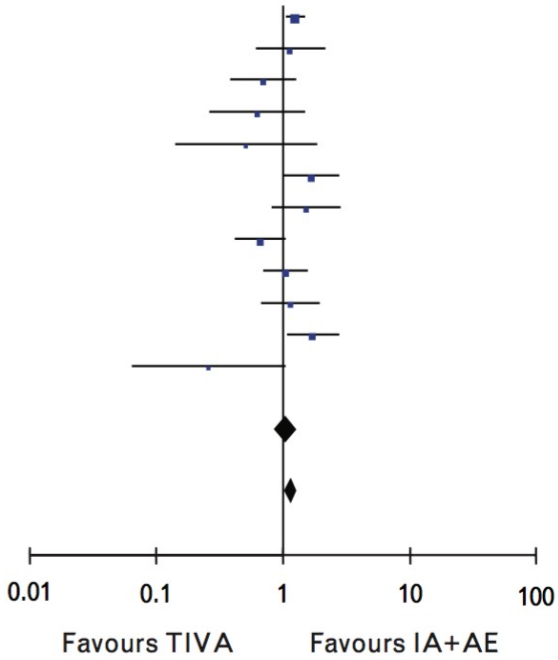
A systematic review and meta-analysis

Maximilian S. Schaefer*, Peter Kranke*, Stephanie Weibel, Robert Kreysing and Peter Kienbaum

PONV Meta: TIVA vs. IA+AE

	TIVA		IA+AE		Weight, %		
	Events	Total	Events	Total	Random effects	Fixed effect	Risk ratio [95% CI]
Overall PONV							
Apfel 2004[1]	172	345	206	512	17.4	57.1	1.24 [1.07 to 1.44]
Eberhart 2002[25]	17	75	15	75	7.5	3.4	1.13 [0.61 to 2.10]
Gan 1996[26]	9	21	13	21	7.8	3.6	0.69 [0.38 to 1.26]
Heinke 1996[27]	7	43	10	38	4.8	1.7	0.62 [0.26 to 1.46]
Jellish 1995[28]	3	34	6	34	2.4	0.8	0.50 [0.14 to 1.84]
Jokela 2000[29]	27	60	16	60	9.4	5.0	1.69 [1.02 to 2.79]
Khan 2005[30]	10	20	13	40	7.4	3.3	1.54 [0.82 to 2.88]
Paech 2002[33]	17	47	26	47	10.3	6.1	0.65 [0.41 to 1.03]
Park 2011[35]	25	50	24	50	11.6	8.0	1.04 [0.70 to 1.55]
Purhonen 2006[36]	19	50	17	51	9.0	4.6	1.14 [0.67 to 1.93]
White 2007[37]	28	58	19	68	10.2	5.9	1.73 [1.08 to 2.75]
Özünlü 2005[32]	2	20	8	20	2.1	0.6	0.25 [0.06 to 1.03]
Random effects	336	823	373	1016	100.0	–	1.06 [0.85 to 1.32]
Fixed effect					–	100.0	1.16 [1.03 to 1.30]

Heterogeneity: Tau^2 =0.07; X^2 =23.8,df =11, p = 0.01;I^2= 54%
Test for overall effect (random effects): Z = 0.53, p = 0.60
Test for overall effect (fixed effect): Z = 2.56, p = 0.01



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[Intervention Review]

Drugs for preventing postoperative nausea and vomiting in adults after general anaesthesia: a network meta-analysis

Stephanie Weibel[1], Gerta Rücker[2], Leopold HJ Eberhart[3], Nathan L Pace[4], Hannah M Hartl[1], Olivia L Jordan[1], Debora Mayer[1], Manuel Riemer[1], Maximilian S Schaefer[5,6], Diana Raj[7], Insa Backhaus[8], Antonia Helf[1], Tobias Schlesinger[1], Peter Kienbaum[5], Peter Kranke[1]

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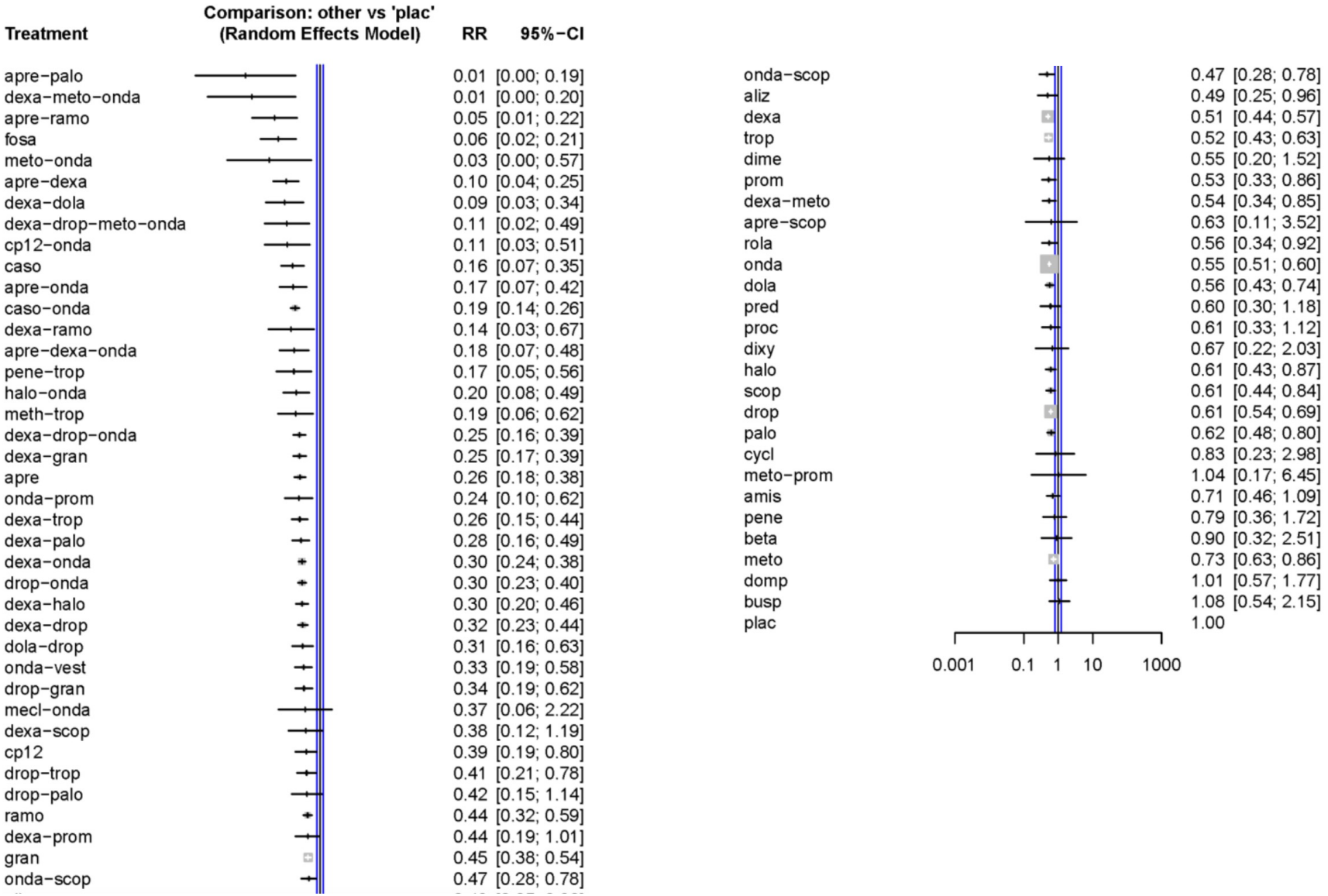
PONV-Prophylaxe



Universitätsklinikum Düsseldorf

PONV-Prophylaxe: Wirksamkeit

HEINRICH HEINE UNIVERSITÄT DÜSSELDORF

BENEFIT

Patient or population: Adults undergoing any type of surgery under general anaesthesia

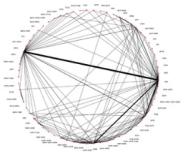
Interventions: Antiemetic drugs (mono- and combination prophylaxis)*

Comparator (reference): Placebo (or no treatment)

Outcome: Vomiting (or dry retching) within 24 hours postoperatively

Setting: In- and outpatient

Geometry of the network**

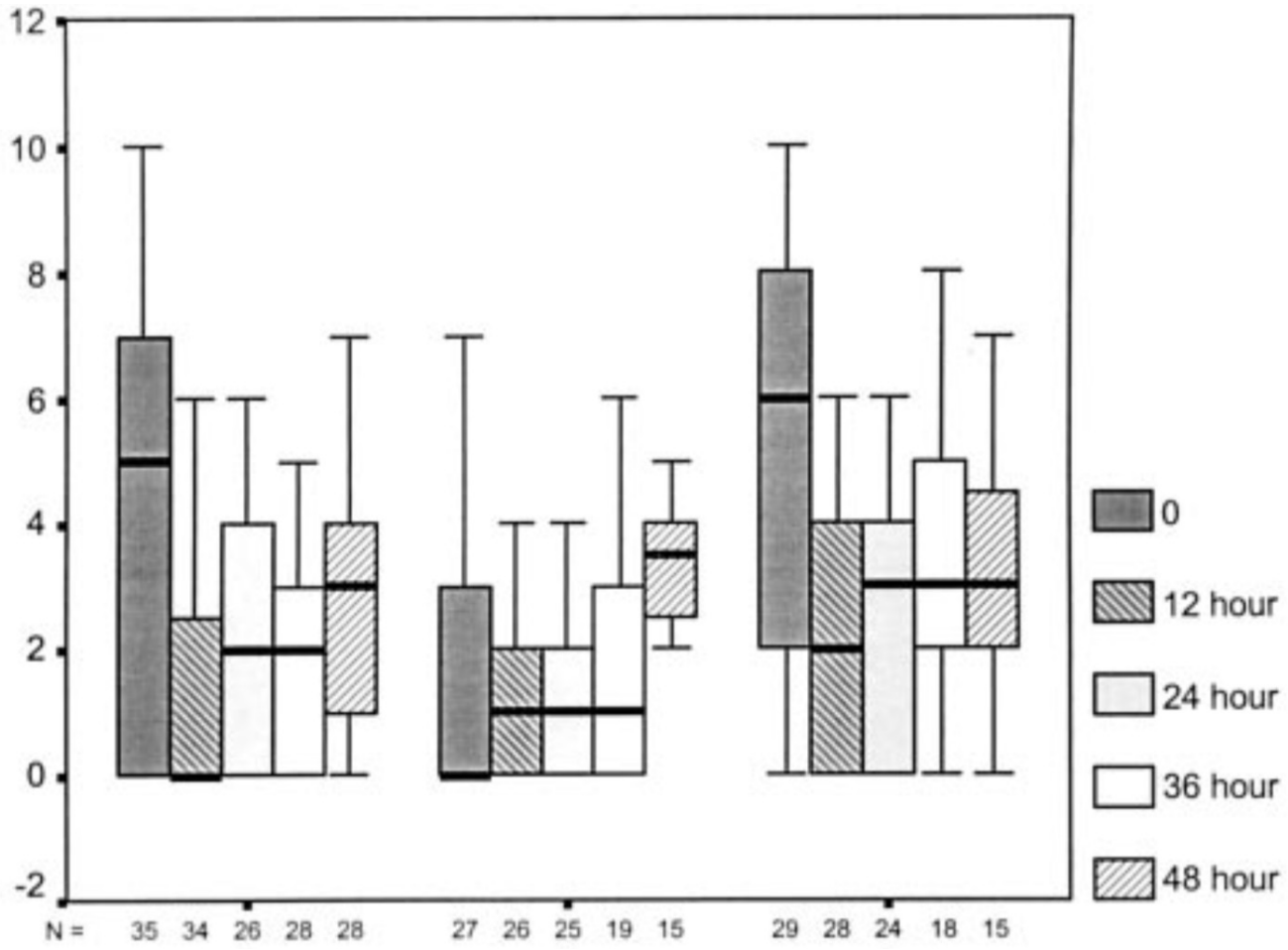


Total studies: 282 RCT **Total participants:** 50812 **Number of treatments:** 65	**Relative effect*** (95% CI)**	**Anticipated absolute effect **** (95% CI)**			**Certainty of evidence**	**Interpretation of findings**
		Without intervention	With intervention	Difference		
5-HT$_3$ receptor antagonists						
Granisetron (16 RCT; 2270 participants)	**0.45** (0.38 to 0.54)	300 per 1000[1]	135 per 1000	165 fewer per 1000 (186 fewer to 138 fewer)	⊕⊕⊕⊕ **High**[3]	**Granisetron reduces vomiting**
Ondansetron (77 RCT; 14435 participants)	**0.55** (0.51 to 0.60)	300 per 1000[1]	165 per 1000	135 fewer per 1000 (147 fewer to 120 fewer)	⊕⊕⊕⊕ **High**[3]	**Ondansetron reduces vomiting**
D$_2$ receptor antagonists						
Droperidol (41 RCT; 6156 participants)	**0.61** (0.54 to 0.69)	300 per 1000[1]	183 per 1000	117 fewer per 1000 (138 fewer to 93 fewer)	⊕⊕⊕⊖ **Moderate** Due to publication bias, heterogeneity[3,7]	**Droperidol probably reduces vomiting**
Haloperidol (4 RCT; 327 participants)	**0.61** (0.43 to 0.87)	300 per 1000[1]	183 per 1000	117 fewer per 1000 (171 fewer to 39 fewer)	⊕⊕⊖⊖ **Low** Due to imprecision, incoherence	**Haloperidol may reduce vomiting**
Metoclopramide (21 RCT; 2134 participants)	**0.73** (0.63 to 0.86)	300 per 1000[1]	219 per 1000	81 fewer per 1000 (111 fewer to 42 fewer)	⊕⊖⊖⊖ **Very low** Due to study limitations, imprecision, incoherence	**We are uncertain whether metoclopramide reduces vomiting**
NK$_1$ receptor antagonists						
Aprepitant (1 RCT; 94 participants)	**0.26** (0.18 to 0.38)	300 per 1000[1]	78 per 1000	222 fewer per 1000 (246 fewer to 186 fewer)	⊕⊕⊕⊕ **High**	**Aprepitant reduces vomiting**
Corticosteroids						
Dexamethasone (43 RCT; 4804 participants)	**0.51** (0.44 to 0.57)	300 per 1000[1]	153 per 1000	147 fewer per 1000 (168 fewer to 471 fewer)	⊕⊕⊕⊕ **High**[3]	**Dexamethasone reduces vomiting**
Antihistamines						
Dimenhydrinate (1 RCT; 56 participants)	**0.55** (0.20 to 1.52)	300 per 1000[1]	165 per 1000	135 fewer per 1000 (240 fewer to 156 more)	⊖⊖⊖⊖ **Very low** Due to study limitations, imprecision, incoherence[10]	**We are uncertain whether dimenhydrinate reduces vomiting**

- Präoperative Phase
  - Risikoeinschätzung und Anästhesieplanung
- Intraoperative Phase
  - Dosisanpassung
  - Anästhesieeinleitung und Beatmung
  - Ideales Anästhetikum zur Anästhesieaufrechterhaltung
  - PONV
- Postoperative Phase
  - Postoperative Analgesie
  - Aufwachraum vs. IMC-Station

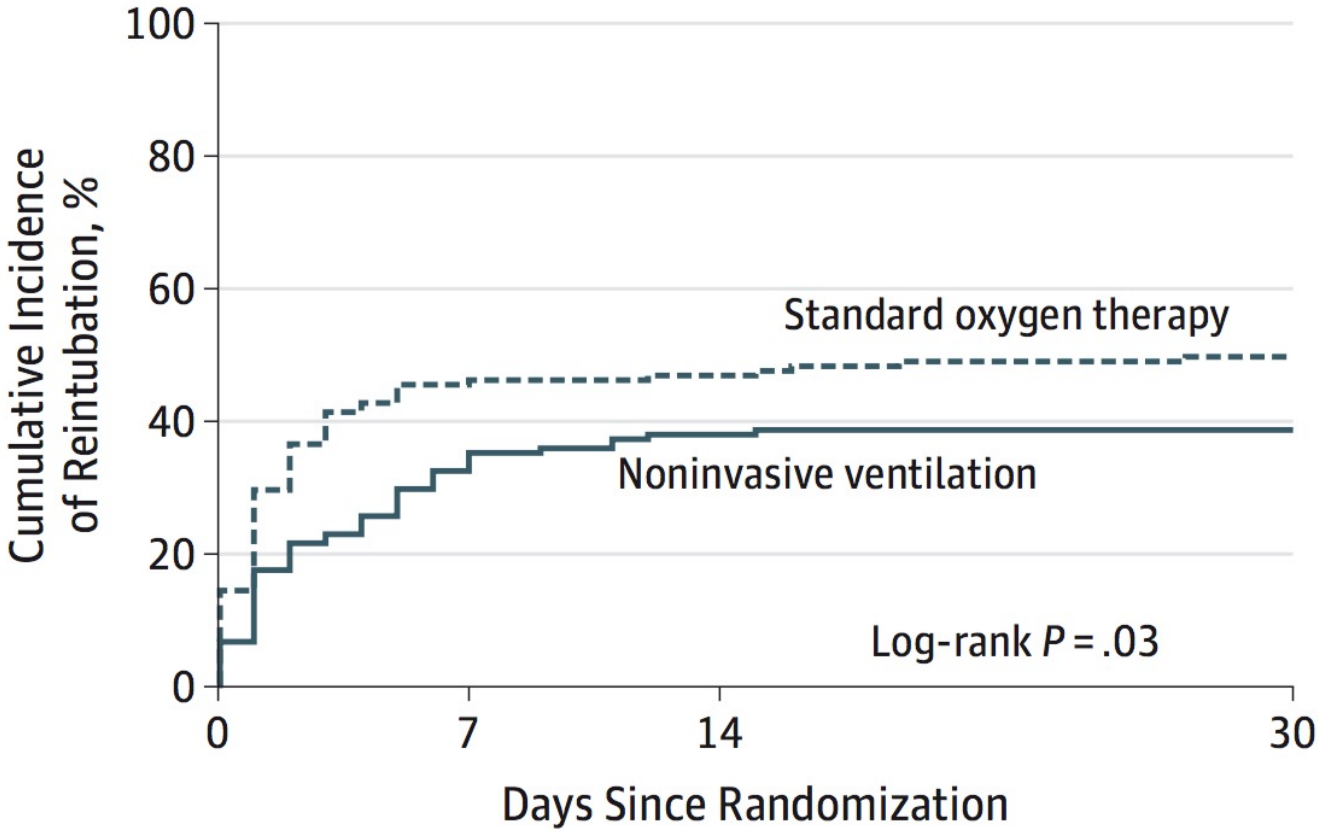
Postoperative Analgesie

VAS



LA + PCIA PDA PCIA

NIV und Reintubation



No. at risk				
Standard oxygen therapy	145	79	76	71
Noninvasive ventilation	148	99	90	87

Jaber S et al.: JAMA 2016; 315: 1345-53

Postop Hypoxämie: OSAS vs. non-OSAS

	OSA (n=31)	Non-OSA (n=9)	*P*
Median Spo_2 with supplemental oxygen during first 24 h postoperatively	97.0 (96.1–97.6)	97.3 (95.4–98.3)	0.97
Gastric bypass	97.0 (96.1–97.4)	96.0 (95.5–97.0)	0.55
Gastric banding	97.1 (96.6–98.4)	98.3 (96.7–98.4)	0.63
Spo_2 after supplemental oxygen discontinuation at 24 h	94.0 (92.0–96.0)	94.0 (91.5–95.5)	0.65
Gastric bypass	94.0 (92.0–96.0)	93.5 (88.8–94.3)	0.34
Gastric banding	95.0 (92.0–99.0)	96.0 (93.0–96.0)	0.82
Total hypoxemic episodes	53 (31–149)	129 (26–204)	0.52
Gastric bypass	53 (33–149)	168 (34–226)	0.24
Gastric banding	82 (23–149)	29 (24–129)	0.84
>5 hypoxemic episodes/h, n (%)	10 (33)	4 (44)	0.69
Gastric bypass	8 (37)	4 (66.7)	0.35
Gastric banding	2 (25)	0	1.0
Percent of time <90% sat	0.2 (0.06–0.7)	0.6 (0–1.6)	0.48
Gastric bypass	0.20 (0.06–0.85)	0.75 (0.4–6.5)	0.17
Gastric banding	0.10 (0.0–0.70)	0 (0–0.8)	0.59
Oxygen desaturation index <4% of sleep study baseline	1.2 (0.8–3.4)	2.9 (0.6–6.0)	0.44
Gastric bypass	1.3 (0.8–4.0)	4.5 (0.5–7.8)	0.43
Gastric banding	1.1 (0.7–2.0)	2.0 (0.8–2.9)	0.40

Data presented as median (interquartile range), unless stated.

Ahmad S et al.: Anest Analg 2008; 107: 138-43

OSAS und „knowlege gaps“

1. **How can we identify patients with obstructive sleep apnea or obesity hypoventilation syndrome at highest risk of postoperative cardiopulmonary complications?**
2. **How do we prevent postoperative cardiopulmonary complications in patients with obstructive sleep apnea or obesity hypoventilation syndrome?**

Ayas NT et al: Ann Am Thors Soc 2018; 15:117-126

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S3-LEITLINIE

S3 Leitlinie Nicht erholsamer Schlaf/Schlafstörung Kapitel „Schlafbezogene Atmungsstörungen bei Erwachsenen“

AWMF-Register Nr.	063/001	Klasse	S3

Version 2.0 (August 2017)

1.2.1 Perioperatives Management

a. Fragen zur OSA sollten Bestandteil einer präoperativen Anamnese sein (B).
b. Bei Verdacht auf das Vorliegen einer bisher nicht bekannten OSA sollte eine schlafmedizinische Abklärung erfolgen, wobei zwischen der Dringlichkeit des operativen Eingriffs und der Notwendigkeit bzw. Art einer schlafmedizinischen Abklärung im Einzelfall abgewogen werden muss (B).
c. Bei Vorliegen einer behandlungsbedürftigen OSA sollte eine bereits eingeleitete CPAP-Therapie in der perioperativen Phase fortgeführt bzw. eine Einleitung erwogen werden, sofern die Dringlichkeit des operativen Eingriffs dies zulässt (B).
d. Die Auswahl des Anästhesieverfahrens sowie die Art und Dauer einer eventuell notwendigen postoperativen Überwachung sollten sich nach der Art und Schwere des Eingriffs und des perioperativen Schmerzmittelbedarfs, der Schwere der (vermuteten) Atmungsstörung und der individuellen Risikokonstellation des Patienten inklusive der OSA-assoziierten Begleiterkrankungen richten (B).

DGAI
Deutsche Gesellschaft für Anästhesiologie & Intensivmedizin

Sitzung des Engeren Präsidiums der DGAI
mit den Leitlinien-Koordinatoren/Delegierten der DGAI
am 16.04.2024, 14:00-16:00 Uhr (Videokonferenz)

Tagesordnung
Stand: 09.04.2024

TOP	Beratungsgegenstand	Berichterstatter	Beratungsziel
1	**Eröffnung, Begrüßung und Feststellung der Tagesordnung**	Pannen	
2	**Berichte der LL-Delegierten/Koordinatoren**		
2.1	S3-LL „Perioperative Versorgung von gebrechlichen Patienten (Frailty)“ (001-048)	von Dossow	Information
2.2	S3-LL „Schlafbezogene Atmungsstörungen“ (063-001)	Rösslein	Information
2.3	S3-LL „Invasive Beatmung und Einsatz extrakorporaler Verfahren bei akuter respiratorischer Insuffizienz“ (001-021)	Sander Fichtner	Information
2.4	S1-LL „Rückenmarknahe Regionalanästhesien und Thromboembolieprophylaxe / antithrombotische Medikation“ (001-005)	Schäfer	Information, ggf. Beschluss-fassung
2.5	S3-LL „Telemedizin in der Intensivmedizin“ (001-034)	Benstöm / Nau	Information
3	**Austausch/Diskussion**		
4	**Verschiedenes**		
5	**Tag, Zeit und Ort der nächsten Sitzung**		

Entlassung aus dem Aufwachraum

The patient is safe to return to the ward only when:

- Routine discharge criteria are met
- The respiratory rate is normal and there are no periods of hypopnea or apnoea for at least one hour
- The arterial oxygen saturation returns to the pre-operative values with or without oxygen supplementation

Nightingale CE et al.: Anaesthesia 2015; 70: 859-76

Meine „Take Home messages“

- Präoperative Phase
  - Dosisanpassung
    - Lean Body Weight: 70 (w) – 80 (m) kg / Adjusted Body Weight
  - Risikoevaluation (aber: ”obesity paradoxon”)
- Intraoperative Phase
  - Anästhesieeinleitung: Propofol, Rocuronium/Succi, Remifentanil
  - Beatmung: PEEP 12 cm H_2O + Rekrutierungsmanöver
  - Anästhesieaufrechterhaltung: Desfluran/Remifentanil + RA/LA
  - PONV-Prophylaxe: Dexa+Setrone+DHB oder Aprepitant
- Postoperative Phase
  - Sparsamer Einsatz von Opioiden, RA vorteilhaft!
  - Liberal CPAP / NIV im Aufwachraum einsetzen!

Vielen Dank !

Please get in touch with me via mail: kienbaum@hhu.de