Clinical guidelines

-what's up and what's new?

Jon Henrik Laake

SSAI Clinical Practice Committee
and Rikshospitalet – Oslo University Hospital


Clinical Practice
Quality Control
Obser-vational studies
Clinical trials
Guidelines
Education
SSAI
19 Nordisk Anæstesiologisk Forening 49
The Scandinavian Society of Anaesthesiology and Intensive Care Medicine

Evidence based

Elegance based

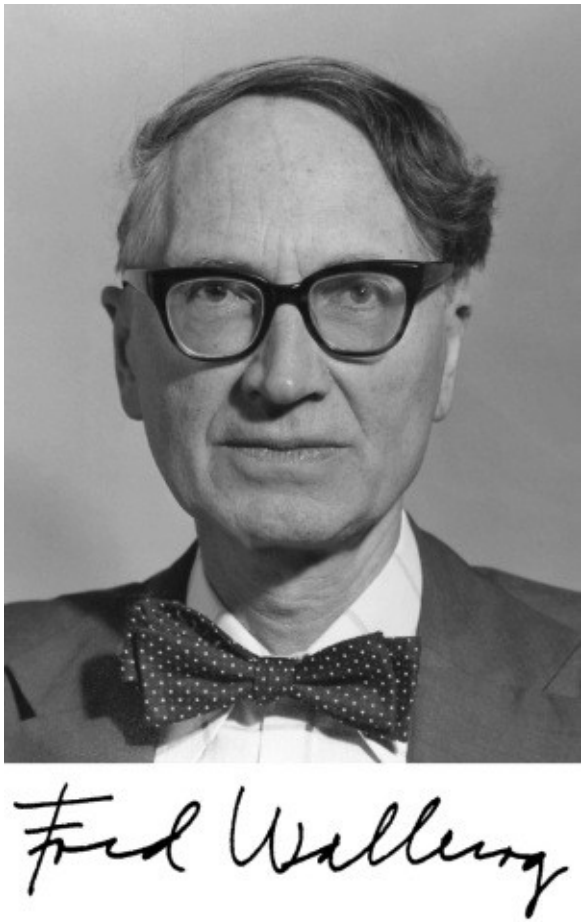
JAMA The Journal of the American Medical Association

VIEWPOINT

Specialty Society Clinical Practice Guidelines
Time for Evolution or Revolution?

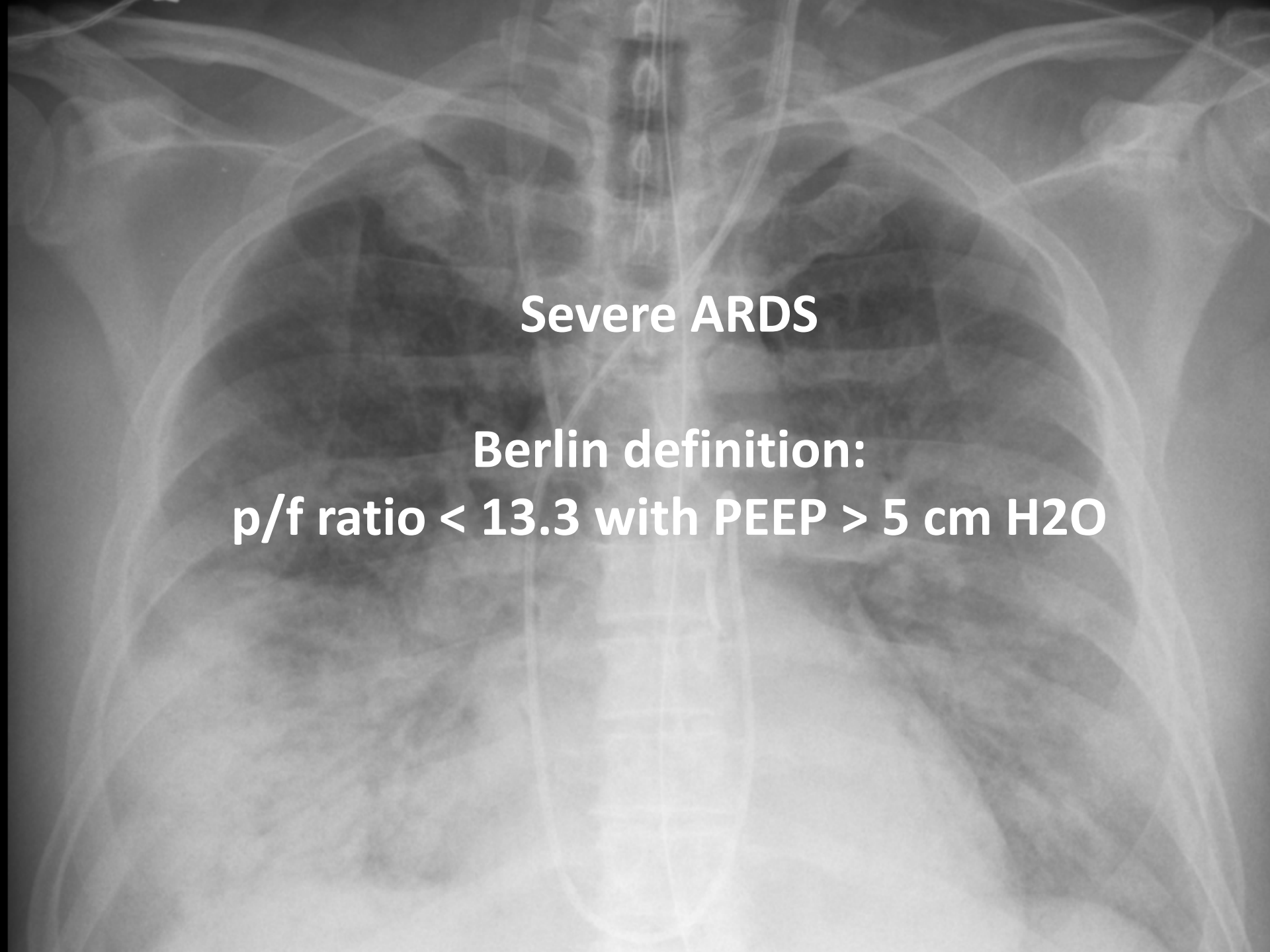
"Most specialty societies cannot afford the financial expense to replicate the **ACC/AHA or American Cancer Society experience**, and the need for a more economic and streamlined process with a succinct work product suggests another pathway is clearly called for. That pathway is likely to be successful through partnerships with other organizations that have expertise in implementation science, multistakeholder perspectives, and transparency regarding COIs."

"the Clinical Practice Guideline development process should continue to be led by specialty societies *but* **with a new model that integrates other stakeholders, including patients"**



” There was never a lack of good ideas! ”

Fred Walberg 1921- 2005

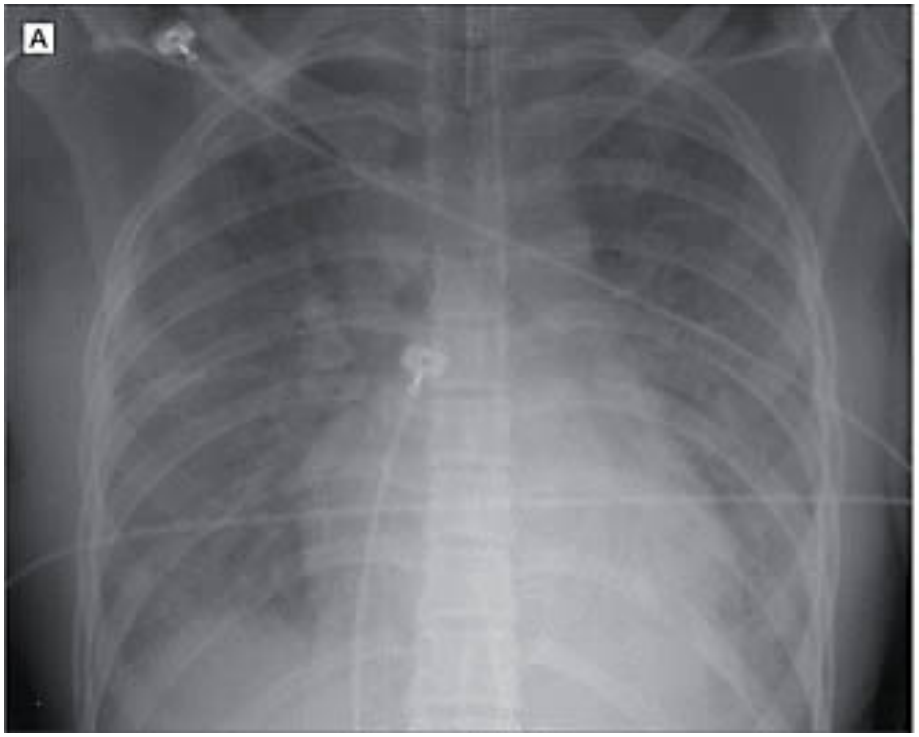

Severe ARDS
Berlin definition:
p/f ratio < 13.3 with PEEP > 5 cm H2O

Pathophysiology

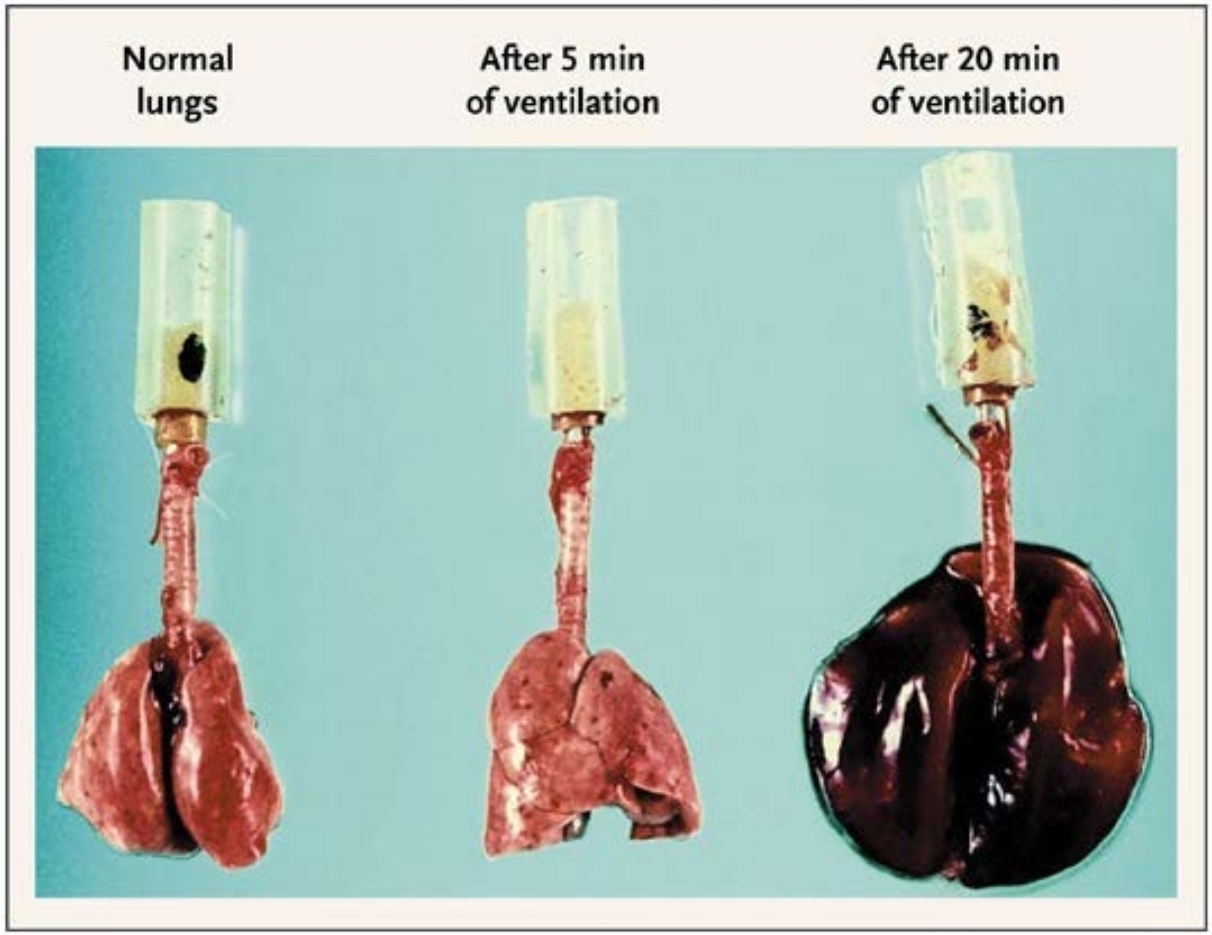
- Oxygenation failure
- Ventilation failure
- Inflammation
- Coagulopathy
- Pulmonary oedema
- V/Q disturbances
- Pulmonary hypertension
- Extrapulmonary organ failure

Therapy ?

Baby lung



Gattinoni et al.



Normal Rat Lungs and Rat Lungs after Receiving High-Pressure Mechanical Ventilation at a Peak Airway Pressure of 45 cm of Water.

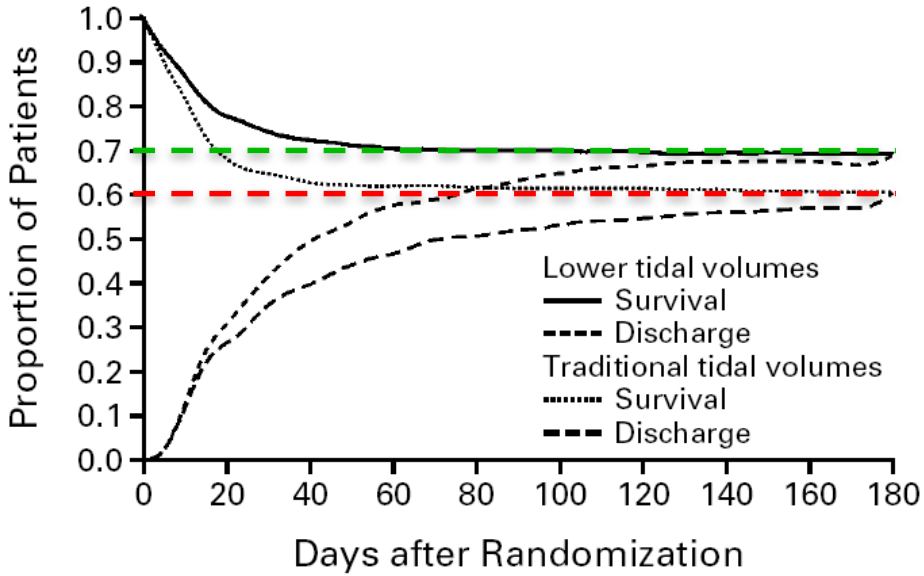
Dreyfuss D, Saumon G. Ventilator-induced lung injury: lessons from experimental studies. Am J Respir Crit Care Med 1998;157:294-323.

The New England
Journal of Medicine

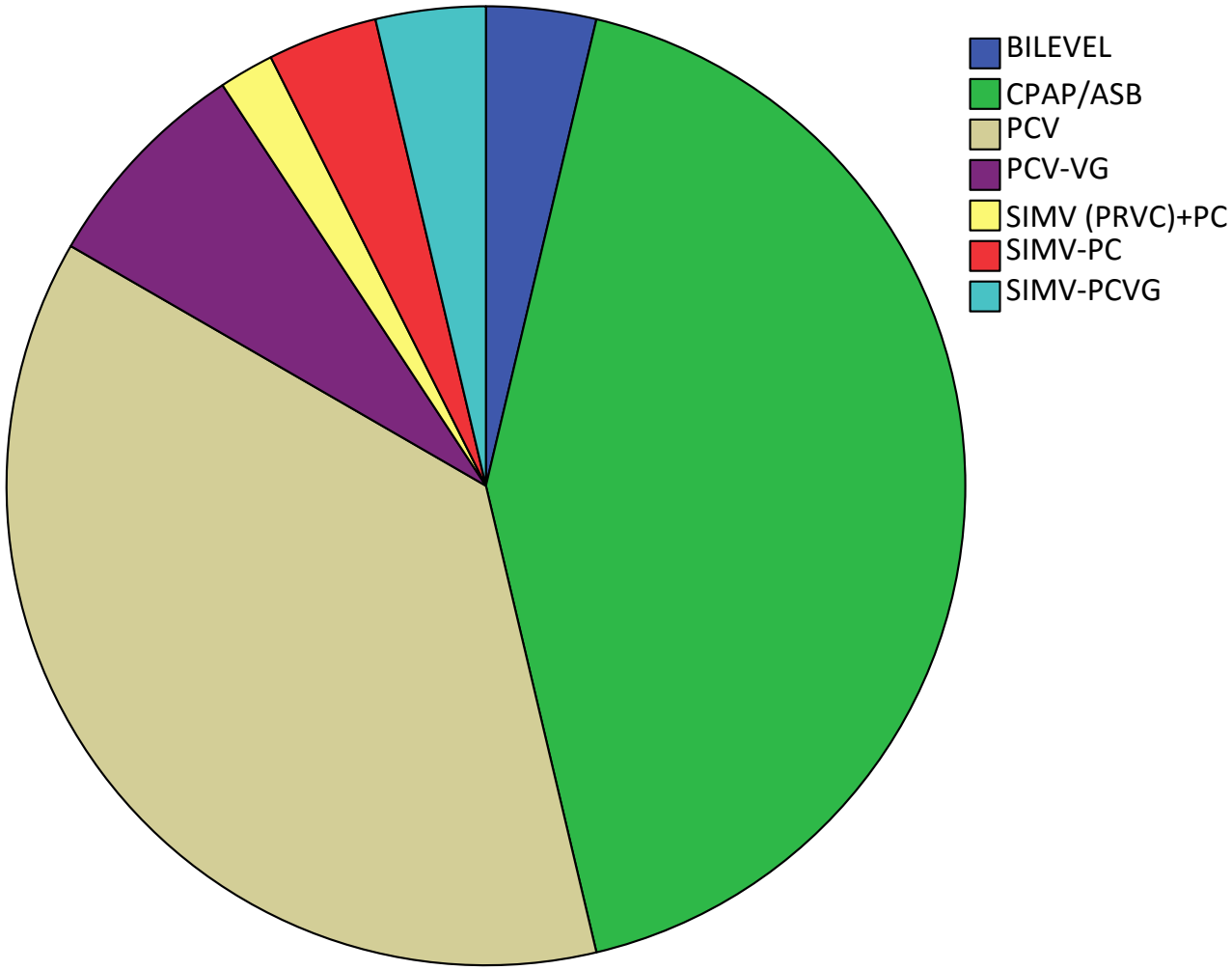
VOLUME 342 MAY 4, 2000 NUMBER 18

VENTILATION WITH LOWER TIDAL VOLUMES AS COMPARED WITH TRADITIONAL TIDAL VOLUMES FOR ACUTE LUNG INJURY AND THE ACUTE RESPIRATORY DISTRESS SYNDROME

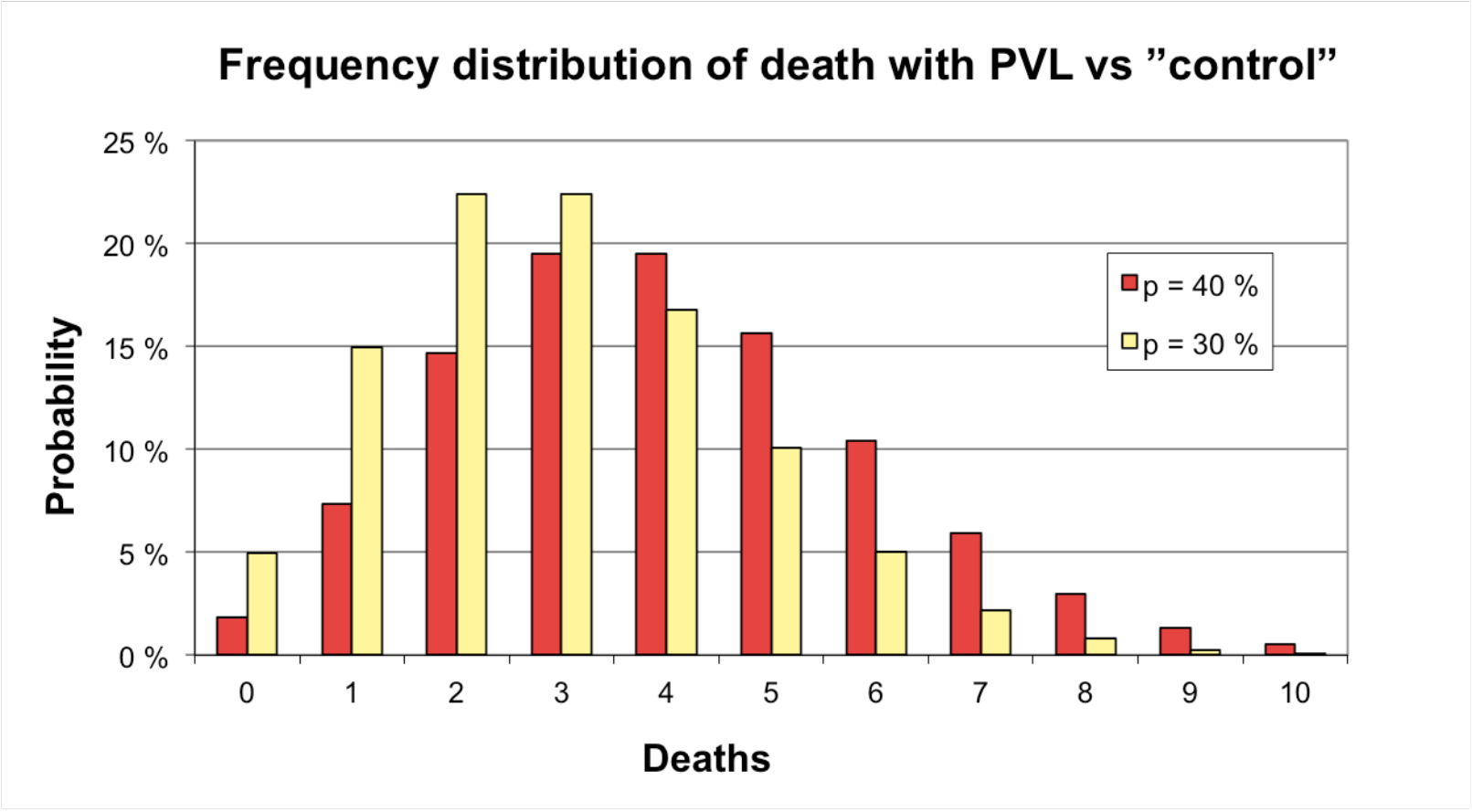
THE ACUTE RESPIRATORY DISTRESS SYNDROME NETWORK*



Ventilator mode in ARDS

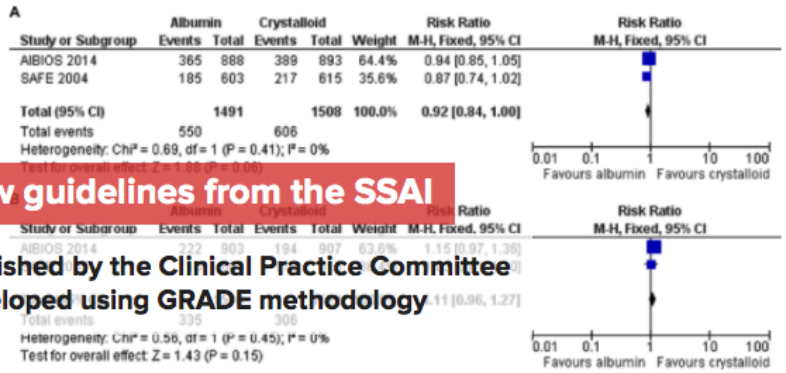


” In my experience… ”



SSAI.info

News



New guidelines from the SSAI

published by the Clinical Practice Committee

developed using GRADE methodology

The world sepsis day September 13th, 2015 – a call for action!

September 1, 2015

The non-profit organization Global sepsis alliance (an alliance of several other non-profit organizations like WFSICCM) announces a call for action to raise public and professional awareness of sepsis and to increase survival. Please find more information here. You can sign the world sepsis declaration and follow the webinar September 13th!

Read more

esicm.org is safe and can be used as usual

August 25, 2015

Today (26/8-15), ESICM provided proof that the issue of potential cyber attack of the provider of the website is solved. You can therefore use esicm.org as usual and especially the registration site for the congress! Message to the Norwegian healthcare authorities is sent and hopefully access to esicm.org from...

Read more

About SSAI

The mission of SSAI is to promote safe, modern and effective care for our patients.

In SSAI the five Nordic nations with shared values and preferences, work together to harmonize the work of the five national societies, based on high Nordic ambitions and expectations in health care and our specialties.

Read more

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Sign up for our newsletter and receive an email when there is important news from SSAI.

Email

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Quicklinks

REVIEW ARTICLE

Scandinavian clinical practice guideline on choice of fluid in resuscitation of critically ill patients with acute circulatory failure

A. Perner[1], E. Junttila[2], M. Haney[3], K. Hreinsson[4], R. Kvåle[5], P. O. Vandvik[6] and M. H. Møller[1]

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[3]Anaesthesiology and Intensive Care Medicine, Umeå University, Umeå, Sweden
[4]Department of Anaesthesiology and Intensive Care Medicine, Landspitali University Hospital, Reykjavik, Iceland
[5]Department of Intensive Care, Haukeland University Hospital, Bergen, Norway
[6]Department of Medicine, Innlandet Hospital Trust-Division Gjøvik, Norway and Norwegian Knowledge Centre for the Health Services, Oslo, Norway

REVIEW ARTICLE

Scandinavian clinical practice guideline on mechanical ventilation in adults with the acute respiratory distress syndrome

J. Claesson[1], M. Freundlich[2], I. Gunnarsson[3], J. H. Laake[4], P. O. Vandvik[5,6], T. Varpula[7] and T. A. Aasmundstad[4]

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What is GRADE ?

The Grading of Recommendations Assessment, Development and Evaluation

G Guyatt, McMaster, Canada

PO Vandvik, UiO

GRADE working group

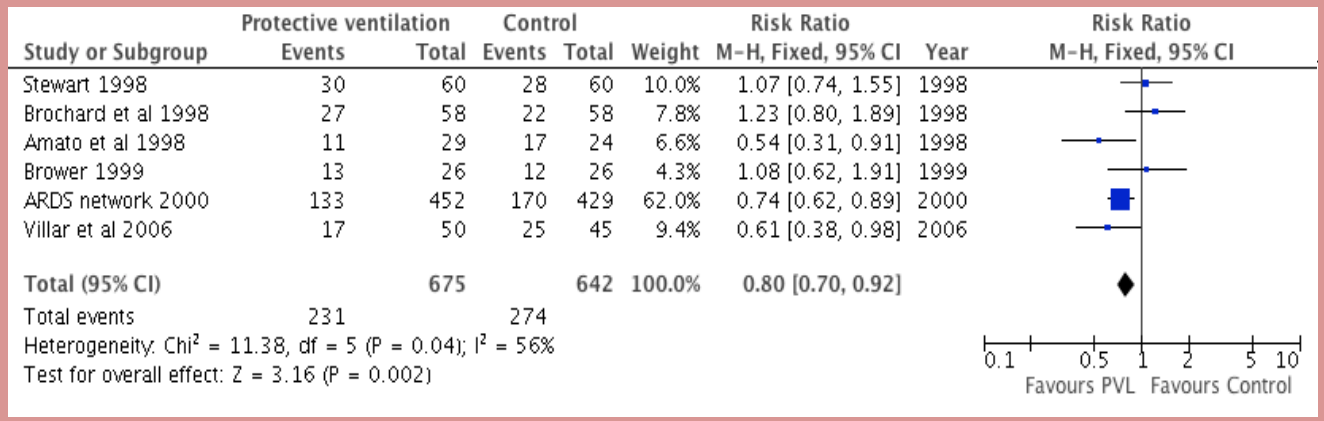
Organizations

Organizations that have endorsed or that are using GRADE*

Some organizations in their enthusiasm to use GRADE, have modified the GRADE approach. We recommend against such modifications because the elements of the GRADE process are interlinked, because modifications may confuse some evidence and guideline users, and because such changes compromise the goal of a single system with which clinicians, policy-makers and patients can become familiar.

World Health Organization	World Health Organization - International	*Example*
The Endocrine Society	Endocrine Society - USA	*Example*
American College of Chest Physicians	American College of Chest Physicians - USA	*Example*
UpToDate	UpToDate - Putting Clinical Information Into Practice - USA	*UTD GRADE tutorial*
Agenzia Sanitaria Regionale	Agenzia sanitaria regionale, Bologna - Italia	
Ontario Health Quality Ontario	Health Quality Ontario, Ontario - Canada	*Example*
Surviving Sepsis	Surviving Sepsis - International	

The guideline process in GRADE

P – Population/Problem	Mechanically ventilated adults with ARDS
I – Intervention	Pressure and Volume limitation (PVL)
C – Comparator	Conventional ventilation
O – Outcome (s)	**Mortality**, Ventilator(-free) days, LOS, O2-efficiency, **Barotrauma**
Evidence •Importance •Effect size •Bias •Inconsistency •Imprecision •Indirectness	
Quality of evidence	High, **<u>Moderate</u>**, Low, Very Low
Benefits vs risks	”Large effect on mortality vs low risk of barotrauma, LOS etc”
Values and preferences	”Reserved for patients with reasonable life prognosis”
Strength of recommendation	**<u>Strong</u>** OR Weak

SPECIAL COMMUNICATION

ONLINE FIRST

Acute Respiratory Distress Syndrome
The Berlin Definition

ARDS is characterized by the following four criteria:

- Lung injury of acute onset, within 1 week of an apparent clinical insult and with progression of respiratory symptoms
- Bilateral opacities on chest imaging not explained by other pulmonal pathology (e.g. pleural effusions, lung collapse, or nodules)
- Respiratory failure not explained by heart failure or volume overload
- Decreased arterial PO2/FiO2 ratio:
    - mild ARDS: ratio is 201 - 300 mmHg (≤ 39.9 kPa)
    - moderate ARDS: 101 - 200 mmHg (≤ 26.6 kPa)
    - severe ARDS: ≤ 100 mmHg (≤ 13.3 kPa)

(a minimum PEEP of 5 cmH2O is required; it may be delivered noninvasively with CPAP to diagnose mild ARDS).

ARDS Definition Task Force, Ranieri VM, Rubenfeld GD, Thompson BT, Ferguson ND, Caldwell E, Fan E, Camporota L, Slutsky AS. Acute respiratory distress syndrome: the Berlin Definition. JAMA, June 20, 2012—Vol 307, No. 23 pages 2526–33.

Scandinavian clinical practice guideline on mechanical ventilation in adults with the acute respiratory distress syndrome

Jonas Claesson, Morten Freundlich, Ivar Gunnarsson, Jon Henrik Laake, Per Olav Vandvik, Tero Varpula, Tor Aksel Aasmundstad

Informal clinical question	PICO Question			
	Population (P)	Intervention (I)	Comparator (C)	Outcomes (O)
1. Should pressure and volume limitation (PVL) be used in patients with ARDS? • Should small tidal volumes always be used in ARDS? • Should plateau pressure always be kept low? (i.e. < 31 cm H2O)	**Mechanically ventilated adults with acute respiratory distress syndrome (ARDS)**	**Pressure and volume limitation (PVL)** • Small tidal volumes (5-8 mL/kg) • Plateau pressure < 31 cm H2O	**Conventional ventilation*** • Large tidal volumes (10-12 mL/kg) • Plateau pressure => 31 cm H2O	**Mortality** • 28/30 days • 60-180 days • ICU • Hospital • Duration of study **Oxygenation efficiency** **Barotrauma** **LOS in ICU** **Ventilator free days** **Days of mechanical ventilation** **Use of rescue therapies**
2. Should PEEP be set to a high or low level?		**High PEEP** • > 5 cm H2O	**Low PEEP** • <= 5 cm H2O	
3. Should mechanical ventilation be spontaneous or controlled?		**Ventilator modes that allow spontaneous breathing**	**Fully controlled ventilation**	
4. Should mechanical ventilation be pressure controlled or volume controlled?		**Pressure controlled ventilation**	**Volume controlled ventilation**	
5. Should patients be ventilated in the prone position?		**Prone ventilation during => 50 % of each ICU-day**	**Ventilation in the supine position only**	
6. Should lung recruitment manoeuvres be utilised in ARDS?		**Lung recruitment manoeuvres**	**No lung recruitment manoeuvres**	
7. Should high frequency oscillatory ventilation (HFOV) be used in ARDS?		**HFOV**	**Conventional mechanical ventilation**	

McMaster PLUS /// helsebiblioteket.no gir deg fri tilgang til denne tjenesten

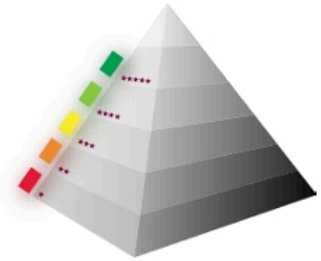
Utvalgte nye studier

Historikk

Mechanical ventilation AND ARDS **Søk**

Current PLUS Database: Lege

Avansert søk



6S model explained
Criteria for articles in PLUS

Oppslagsverk ★★★★★
UpToDate
Best Practice

Oppsummerte oversikter ★★★★★
ACP Journal Club (via PLUS)
DARE

Systematiske oversikter ★★★★★
PLUS Syntheses

Oppsummerte enkeltstudier ★★★★★
ACP Journal Club (via PLUS)

Enkeltstudier ★★★★★
PLUS Studies

Non-Appraised ★★★★★
PubMed Clinical Queries
PubMed

Oppslagsverk ★★★★★

UpToDate

Mechanical ventilation of adults in acute respiratory distress syndrome

Mechanical ventilation of adults in the emergency department

More Results...

Best Practice

Assessment of respiratory alkalosis

Assessment of respiratory acidosis

More Results...

Oppsummerte oversikter ★★★★★

ACP Journal Club (selected via PLUS)

Review: Lower rather than higher tidal volume benefits ventilated patients without ARDS

DARE

Pressure-controlled versus volume-controlled ventilation for acute respiratory failure due to acute lung injury (ALI) or acute respiratory distress syndrome (ARDS)

Neuromuscular blocking agents for patients with acute respiratory distress syndrome

More Results...

Systematiske oversikter ★★★★★

PLUS Syntheses

Corticosteroid Therapy for Patients Hospitalized With Community-Acquired Pneumonia: A Systematic Review and Meta-analysis.*(Systematic Review)*

High-frequency ventilation does not provide mortality benefit in comparison with conventional lung-protective ventilation in acute respiratory distress syndrome: a meta-analysis of the randomized controlled trials.*(Systematic Review)*

More Results...

Oppsummerte Enkeltstudier ★★★★★

ACP Journal Club (selected via PLUS)

Prone positioning for 16 h/d reduced mortality more than supine positioning in early severe ARDS

48 hours of cisatracurium reduced 90-day mortality in patients with early, severe ARDS

More Results...

Enkeltstudier (pre-appraised by these criteria) ★★★★★

PLUS Studies

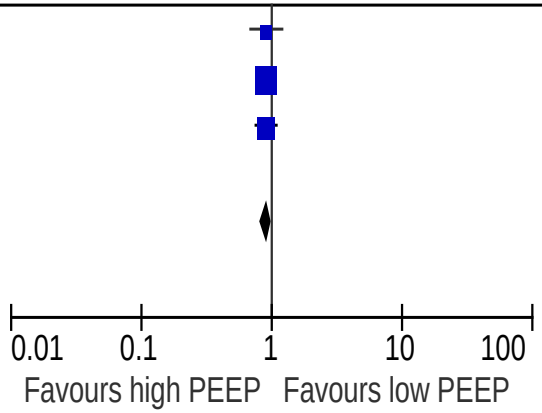
The Adult Calfactant in Acute Respiratory Distress Syndrome Trial.*(Original Study)*

Forest plot of comparison: High PEEP vs Low PEEP, outcome: Hospital mortality [death before discharge].

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Risk Ratio M-H, Fixed, 95% CI	Year
Brower 2004	69	276	75	273	17.8%	0.91 [0.69, 1.21]	2004
Meade et al 2008	173	475	205	508	46.8%	0.90 [0.77, 1.06]	2008
Mercat et al 2008	136	385	149	382	35.4%	0.91 [0.75, 1.09]	2008
Total (95% CI)		**1136**		**1163**	**100.0%**	**0.90 [0.81, 1.01]**	
Total events	378		429				

Heterogeneity: Chi² = 0.00, df = 2 (P = 1.00); I² = 0%

Test for overall effect: Z = 1.76 (P = 0.08)

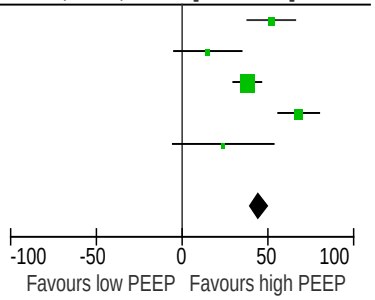


Forest plot of comparison: High PEEP vs Low PEEP, outcome: Oxygenation efficiency [PO2/FiO2].

Study or Subgroup	Experimental Mean [PaO2/FiO2]	Experimental SD [PaO2/FiO2]	Experimental Total	Control Mean [PaO2/FiO2]	Control SD [PaO2/FiO2]	Control Total	Weight	Mean Difference IV, Fixed, 95% CI [PaO2/FiO2]	Year
Brower 2004	220	89	244	168	66	230	16.7%	52.00 [37.95, 66.05]	2004
Villar et al 2006	139	43	50	124	54	45	8.4%	15.00 [-4.77, 34.77]	2006
Meade et al 2008	187	69	464	149	61	498	48.4%	38.00 [29.75, 46.25]	2008
Mercat et al 2008	218	97	378	150	69	371	22.7%	68.00 [55.96, 80.04]	2008
Huh 2009	161	65	30	137	48	27	3.8%	24.00 [-5.48, 53.48]	2009
Total (95% CI)			**1166**			**1171**	**100.0%**	**44.69 [38.95, 50.43]**	

Heterogeneity: Chi² = 28.52, df = 4 (P < 0.00001); I² = 86%

Test for overall effect: Z = 15.26 (P < 0.00001)

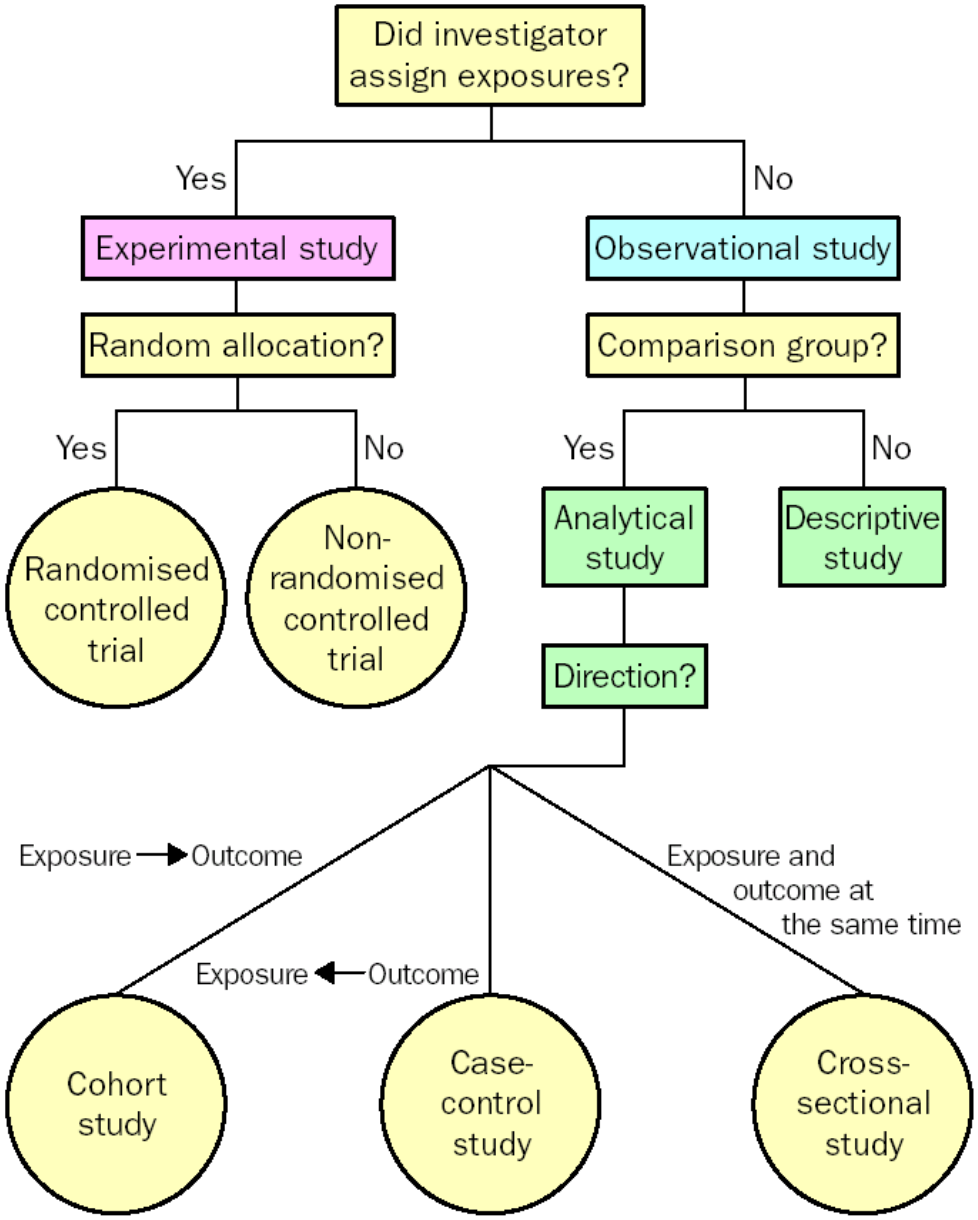


Downgrading

- Bias
- Inconsistency
- Imprecision
- Indirectness

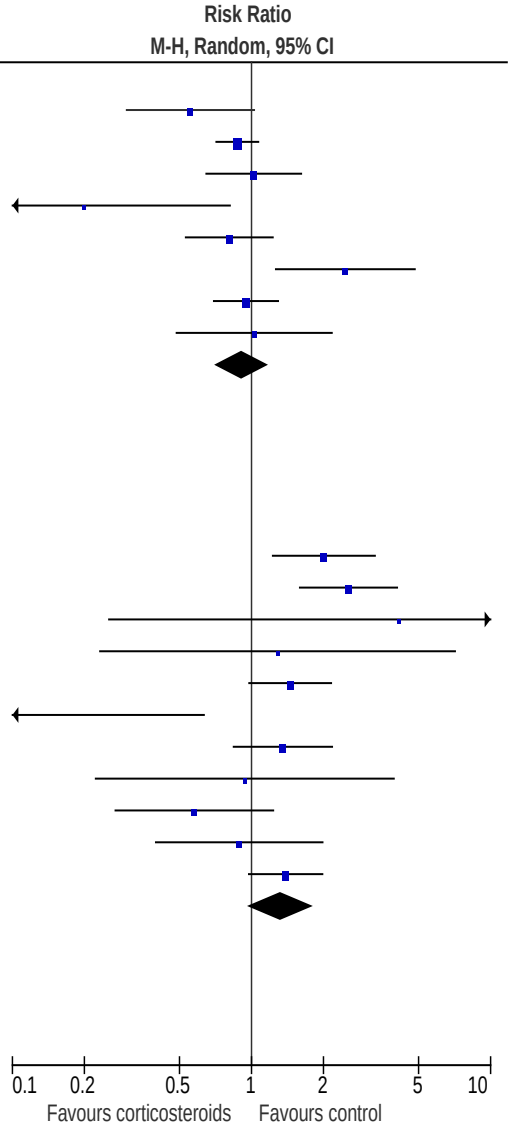
- Benefits vs harms
- Values and preferences

”Bias”


Did investigator assign exposures?
Yes
No
Experimental study
Observational study
Random allocation?
Comparison group?
Yes
No
Yes
No
Randomised controlled trial
Non-randomised controlled trial
Analytical study
Descriptive study
Direction?
Exposure → Outcome
Exposure ← Outcome
Exposure and outcome at the same time
Cohort study
Case-control study
Cross-sectional study

”Inconsistency” - Corticosteroids vs placebo; Outcome: Hospital- or 60-day mortality

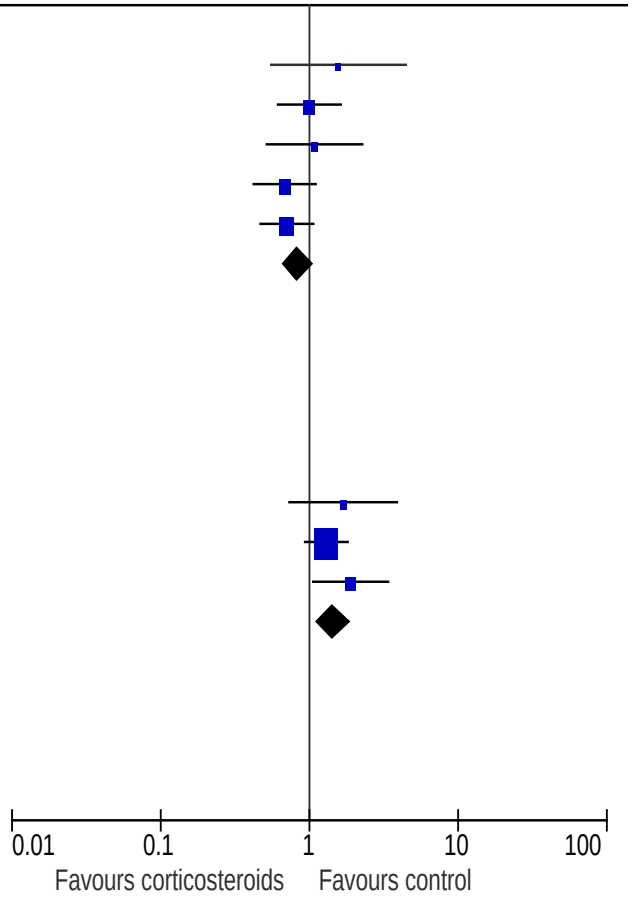
Study or Subgroup	Corticosteroids Events	Total	Placebo Events	Total	Weight	Risk Ratio M-H, Random, 95% CI	Year
4.1.1 RCTs							
Meduri 2007	15	63	12	28	10.3%	0.56 [0.30, 1.03]	2007
Annane 2006	54	85	67	92	21.9%	0.87 [0.71, 1.07]	2006
Steinberg 2006	26	89	26	91	14.0%	1.02 [0.65, 1.62]	2006
Meduri 1998	2	16	5	8	2.9%	0.20 [0.05, 0.81]	1998
Luce 1988	9	13	12	14	15.1%	0.81 [0.53, 1.23]	1988
Bone 1987	26	50	8	38	9.3%	2.47 [1.26, 4.83]	1987
Bernard 1987	30	50	31	49	18.5%	0.95 [0.69, 1.29]	1987
Weigelt 1985	11	25	6	14	8.0%	1.03 [0.49, 2.17]	1985
Subtotal (95% CI)		**391**		**334**	**100.0%**	**0.91 [0.71, 1.18]**	
Total events	173		167				
Heterogeneity: Tau² = 0.07; Chi² = 16.63, df = 7 (P = 0.02); I² = 58%							
Test for overall effect: Z = 0.70 (P = 0.49)							
4.1.2 Cohort studies							
Brun-Buisson 2011	28	83	21	125	13.4%	2.01 [1.23, 3.29]	2011
Martin-Loeches 2011	58	126	17	94	13.8%	2.55 [1.59, 4.07]	2011
Linko 2011	7	46	0	12	1.2%	4.15 [0.25, 67.96]	2011
Schellengowski 2011	6	14	1	3	2.9%	1.29 [0.23, 7.11]	2011
Bajwa 2009	16	30	54	147	15.1%	1.45 [0.98, 2.16]	2009
Lee 2005	1	12	7	8	2.4%	0.10 [0.01, 0.63]	2005
Song 2003	43	60	9	17	13.7%	1.35 [0.84, 2.18]	2003
Varpula 2000	3	16	3	15	3.9%	0.94 [0.22, 3.94]	2000
Keel 1998	5	13	12	18	9.2%	0.58 [0.27, 1.24]	1998
Headley 1997	4	9	17	34	8.7%	0.89 [0.40, 1.99]	1997
Fowler 1985	39	53	18	34	15.9%	1.39 [0.97, 1.98]	1985
Subtotal (95% CI)		**462**		**507**	**100.0%**	**1.32 [0.96, 1.81]**	
Total events	210		159				
Heterogeneity: Tau² = 0.13; Chi² = 23.28, df = 10 (P = 0.010); I² = 57%							
Test for overall effect: Z = 1.72 (P = 0.09)							



Test for subgroup differences: Chi² = 3.14, df = 1 (P = 0.08), I² = 68.1%

”Inconsistency” - Corticosteroids vs placebo; Outcome: Infectious complications

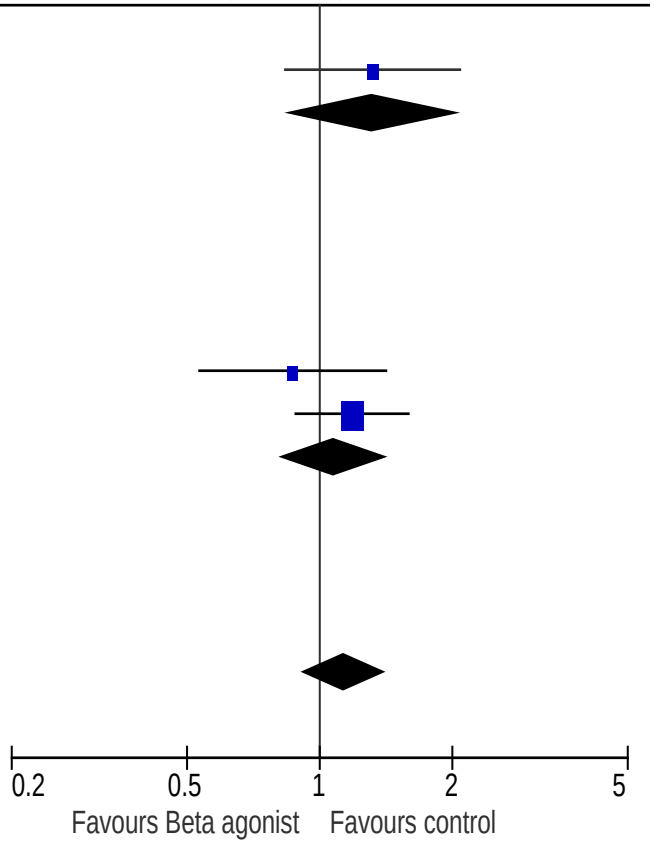
Study or Subgroup	Corticosteroids Events	Total	Control Events	Total	Weight	Risk Ratio M-H, Random, 95% CI	Year
4.4.1 RCTs							
Bernard 1987	8	50	5	49	5.4%	1.57 [0.55, 4.46]	1987
Meduri 1998	12	16	6	8	24.5%	1.00 [0.61, 1.63]	1998
Annane 2006	12	85	12	92	10.6%	1.08 [0.51, 2.28]	2006
Steinberg 2006	20	89	30	91	25.0%	0.68 [0.42, 1.11]	2006
Meduri 2007	27	63	17	28	34.5%	0.71 [0.47, 1.07]	2007
Subtotal (95% CI)		**303**		**268**	**100.0%**	**0.83 [0.65, 1.06]**	
Total events	79		70				
Heterogeneity: Tau² = 0.00; Chi² = 3.70, df = 4 (P = 0.45); I² = 0%							
Test for overall effect: Z = 1.48 (P = 0.14)							
4.4.2 Cohort studies							
Varpula 2000	9	16	5	15	10.7%	1.69 [0.73, 3.89]	2000
Brun-Buisson 2011	38	83	44	125	67.3%	1.30 [0.93, 1.82]	2011
Martin-Loeches 2011	33	126	13	94	22.0%	1.89 [1.06, 3.39]	2011
Subtotal (95% CI)		**225**		**234**	**100.0%**	**1.45 [1.10, 1.91]**	
Total events	80		62				
Heterogeneity: Tau² = 0.00; Chi² = 1.38, df = 2 (P = 0.50); I² = 0%							
Test for overall effect: Z = 2.67 (P = 0.007)							



Test for subgroup differences: Chi² = 8.92, df = 1 (P = 0.003), I² = 88.8%

”Imprecision” - Beta-agonists vs placebo; Outcome: Mortality at end of follow-up for each trial

Study or Subgroup	Beta agonist Events	Total	Control Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
2.1.1 Administration by inhalation						
ARDSnet 2011	37	152	24	130	23.4%	1.32 [0.83, 2.08]
Subtotal (95% CI)		**152**		**130**	**23.4%**	**1.32 [0.83, 2.08]**
Total events	37		24			
Heterogeneity: Not applicable						
Test for overall effect: Z = 1.19 (P = 0.24)						
2.1.2 Administration by intravenous route						
Balti1 2006	11	19	14	21	20.5%	0.87 [0.53, 1.42]
Balti2 2012	62	162	53	164	56.1%	1.18 [0.88, 1.59]
Subtotal (95% CI)		**181**		**185**	**76.6%**	**1.08 [0.81, 1.43]**
Total events	73		67			
Heterogeneity: $Tau^2 = 0.01$; $Chi^2 = 1.18$, df = 1 (P = 0.28); $I^2 = 15\%$						
Test for overall effect: Z = 0.52 (P = 0.61)						
Total (95% CI)		**333**		**315**	**100.0%**	**1.14 [0.91, 1.42]**
Total events	110		91			
Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 1.72$, df = 2 (P = 0.42); $I^2 = 0\%$						
Test for overall effect: Z = 1.16 (P = 0.25)						
Test for subgroup differences: $Chi^2 = 0.54$, df = 1 (P = 0.46), $I^2 = 0\%$						



”Indirectness”

-Looking for data on children; all studies are with adults

-Your patients are ”medical” ARDS-patients; studies included large numbers of trauma patients

-Published studies are from US and south Europe; how to interpret these in a Nordic context?

-No hard end-points, only surrogates; e.g. oxygenation; your interest is survival

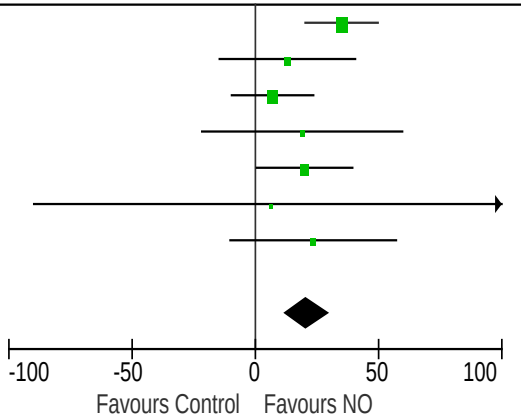
”Benefits vs harms”

Nitric oxide vs placebo; Outcome: p/f ratio

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Dellinger 1998	166	54	120	131	43	57	31.1%	35.00 [20.24, 49.76]
Gerlach 2003	142	46	20	129	43	20	10.5%	13.00 [-14.60, 40.60]
Lundin 1999	138	48	78	131	53	66	25.6%	7.00 [-9.64, 23.64]
Mehta 2001	115	48	8	96	29.3	6	5.0%	19.00 [-21.69, 59.69]
Michael 1998	92	30	16	72	26	16	19.7%	20.00 [0.55, 39.45]
Park 2003	254.2	109.5	11	247.8	89.1	6	0.9%	6.40 [-89.88, 102.68]
Troncy 1998	189.8	40.1	15	166.3	53.2	15	7.2%	23.50 [-10.21, 57.21]
Total (95% CI)			**268**			**186**	**100.0%**	**20.67 [11.39, 29.95]**

Heterogeneity: $Tau^2 = 15.41$; $Chi^2 = 6.62$, df = 6 (P = 0.36); $I^2 = 9\%$

Test for overall effect: Z = 4.37 (P < 0.0001)

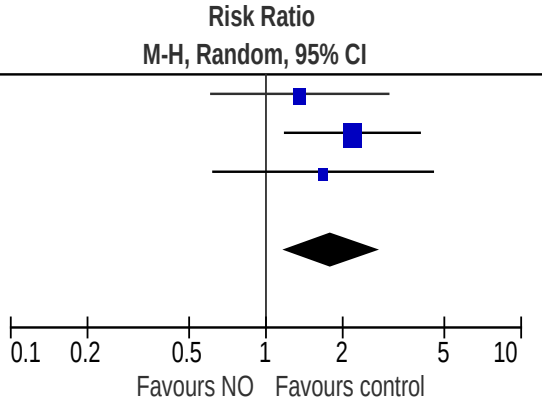


Nitric oxide vs placebo; Outcome: Acute kidney injury

Study or Subgroup	NO Events	Total	Control Events	Total	Weight	Risk Ratio M-H, Random, 95% CI
Dellinger 1998	20	120	7	57	29.6%	1.36 [0.61, 3.02]
Lundin 1999	28	93	12	87	51.1%	2.18 [1.19, 4.02]
Taylor 2004	10	192	6	193	19.3%	1.68 [0.62, 4.52]
Total (95% CI)		**405**		**337**	**100.0%**	**1.80 [1.17, 2.79]**
Total events	58		25			

Heterogeneity: $Tau^2 = 0.00$; $Chi^2 = 0.88$, df = 2 (P = 0.64); $I^2 = 0\%$

Test for overall effect: Z = 2.65 (P = 0.008)



”Values and Preferences”

- Reasonable expectancy of survival with acceptable quality of life?
- Age?
- Cause and Co-morbidity?
- Low income societies?
- Cultural and religious context (e.g. Blood transfusion)

Intervention	Recommendation	QoE	Outcome	Comment
Pressure and volume limitation (PVL)	Strong	Moderate	Death ↓	
PEEP > 5 cm	Weak	Low	O2 ↑ LOS ↑	
FiO2	None	Absent		No trials
Spontaneous breathing modes	None	Absent		No trials
Pressure vs volume control	Weak	Very low		Irrelevant with modern ventilators
Prone positioning	Weak	Very low	O2 ↑ Death ↓	Inconsistent results
Recruitment manoeuvres	Weak	Very low	O2 ↑	Rescue therapy
HFOV	Strong	High	LOS ↑ Death ↑	PVL better

QoE = Quality of evidence LOS = length of stay O2 = oxygenation

Scandinavian clinical practice guideline on mechanical ventilation in adults with the acute respiratory distress syndrom
v0.0 DRAFT

Add New Section

1 About and background

Background Text Add Recommendation

2 Lung protective ventilation

Background Text Add Recommendation

Pressure- and volume limitation

Strong recommendation Options

We recommend use of pressure limitation (plateau pressure < 31 cm H2O) and small tidal volumes (5-8 mL/kg predicted body weight) in patients with ARDS (strong recommendation, moderate quality evidence).

PEEP

Weak recommendation Options

We suggest using positive end-expiratory pressure (PEEP) to improve oxygenation and to prevent atelectasis in all mechanically ventilated patients with respiratory failure (weak recommendation, low quality evidence).

3 Oxygenation

Background Text Add Recommendation

Practice statement Options

No recommendation (no relevant studies)

4 Noninvasive ventilation

Background Text Add Recommendation

Practice statement Options

No recommendation (no relevant studies)

Cochrane Anaesthesia, Critical and Emergency Care

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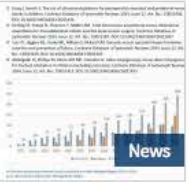
Latest News and Events

New review is out! Warming of intravenous and irrigation fluids for preventing inadvertent perioperative hypothermia

A new podcast has now been released

ACE Annual Report



Cochrane and other training events

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Regional Communities / G-I-N Nordic

G-I-N Nordic

G-I-N Nordic is a regional group, formally established in 2013 to address the needs and provide collaboration opportunities among our members in the Nordic countries.

About G-I-N Nordic

Read More...

Members & Governance

Read More...

September 2015

MO	TU	WE	TH	FR	SA	SU
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7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

Sep 3, 2015 Board Meeting - ...

Sep 16, 2015 Finance & Risks Telecon

Sep 24, 2015 Executive ...

Sep 25, 2015 Conference Committee ...

- Vasoactive agents in circulatory failure
- Drugs and fluids in ARDS
- Emergency anaesthesia
- Prehospital airway management
- Neuraxial blockade in disturbed haemostasis
- Acute pain

Thank you!

Jon Henrik Laake

SSAI Clinical Practice Committee
and Rikshospitalet – Oslo University Hospital