

# Kjernerdata for akutt syke og skadde - i et forskningsperspektiv.

Hans Morten Lossius  
FoU-sjef, dr.med.

Stiftelsen Norsk Luftambulans





## Stifelsen Norsk Luftambulansse

### Oppdrag

*Akutt syke og skadde skal være trygge på at de får den hjelpen de trenger- når det verst tenkelige skjer.*

*... har nesten 800.000 medlemmer i ryggen.*

*... står bak Europas største akuttmedisinske forsknings-nettverk*

## Visjon:

Stiftelsen Norsk Luftambulanse (SNLA) skal være **den ledende akuttmedisinske FoU-Organisasjonen** og **utgjøre et nav for FoU arbeidet i Skandinavia.**

SNLA har som ambisjon å være:

- en premissleverandør innen fagområdet,
- en pådriver i utviklingen av ny kunnskap,
- først til å implementere kunnskapen i alle ledd av kjeden som redder liv

# Forskningsseksjonen

## Medarbeidere:

Tre fast ansatte:



*Elisabeth*



*Erik*



*Jo*

Samt

**21** ph.d. stipendiater

**1** post doc stipendiat

**8** akademiske stillinger finansiert av NLA

## Årlig produksjon

2-3 disputaser

Rundt 20 artikler i PubMed  
indekserte tidsskrift.

Mer enn 60 mediedebatter,  
foredrag m.v.

# Det prehospitalt paradoks

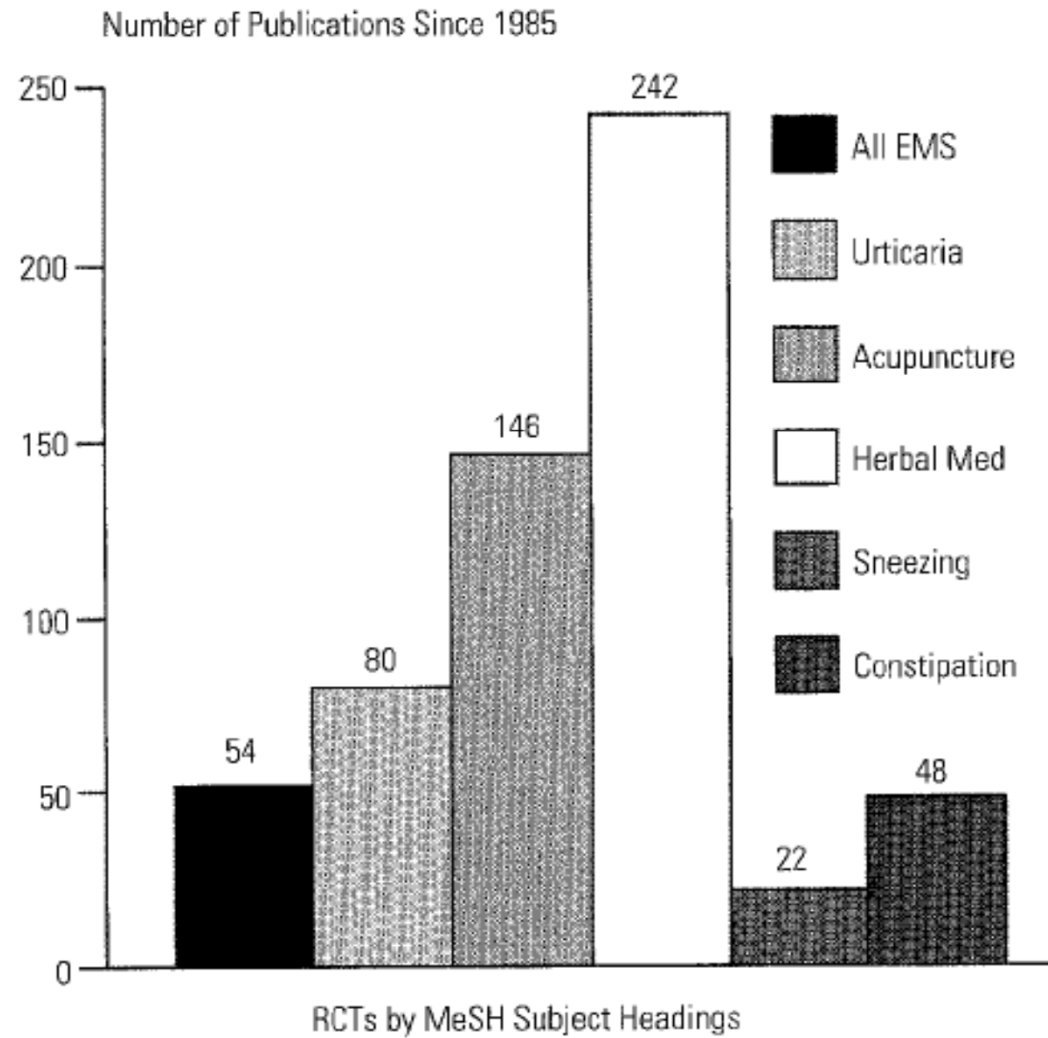
Det er et paradoks at det er vanskeligere å forske på ny prehospital behandling enn å innføre den samme behandlingen uten vitenskapelig vurdering av nytte og risiko

– et prehospitalt paradoks.

*Rehn M, Krüger AJ, Tidsskriftet 2010; 130: 369*

**Figure 2.**

*Published randomized controlled trials in EMS compared with minor medical topics.*



•Callaham M, Ann Emerg Med 1997

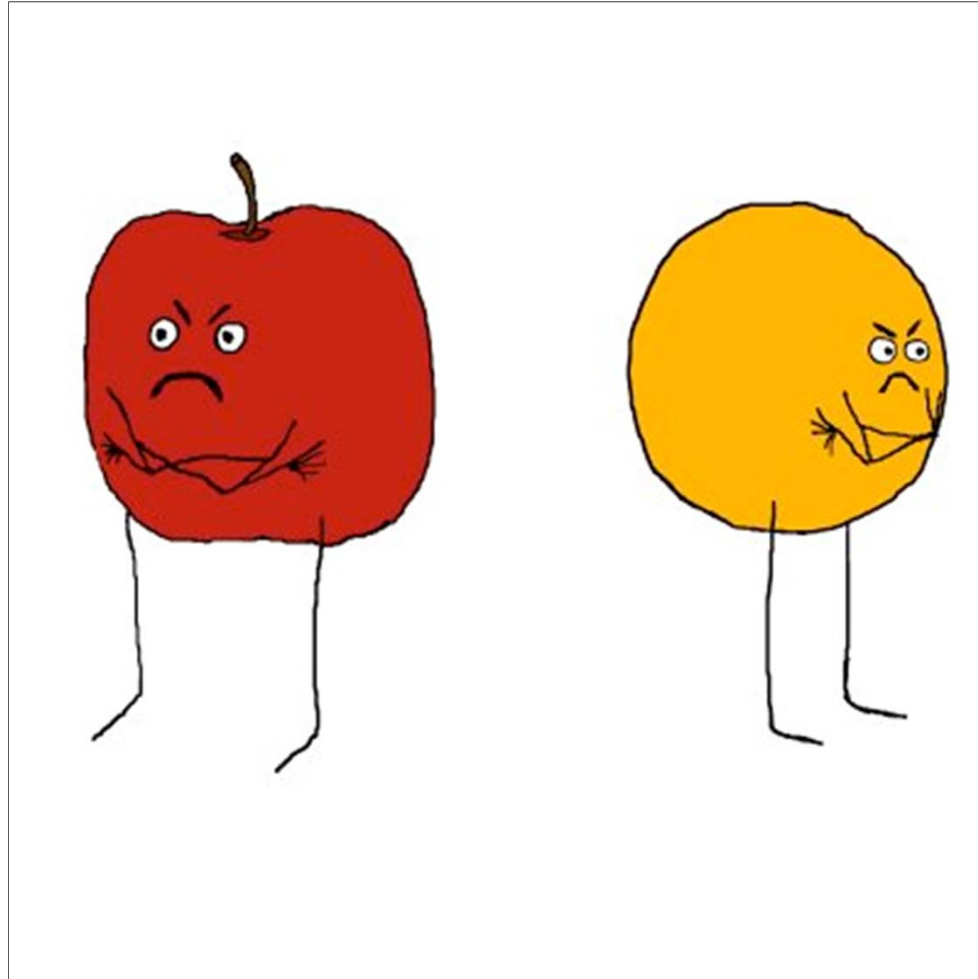
Level	Therapy/Prevention, Aetiology/Harm	Prognosis	Diagnosis	Differential diagnosis/symptom prevalence study	Economic and decision analyses
1a	SR of RCTs	SR of inception cohort studies; validated in different populations	SR of Level 1 diagnostic studies; with 1b studies from different clinical centres	SR of prospective cohort studies	SR of Level 1 economic studies
1b	Individual RCT	Individual inception cohort study with $\geq 80\%$ follow-up; validated in a single population	Validating** cohort study with reference standards; or tested within one clinical centre	Prospective cohort study with good follow-up****	Analysis based on clinically sensible costs or alternatives; systematic review(s) of the evidence; and including multi-way sensitivity analyses
1c	All or none §	All or none case-series	Absolute SpPins and SnNouts††	All or none case-series	Absolute better-value or worse-value analyses ††††
2a	SR (with homogeneity*) of cohort studies	SR (with homogeneity*) of either retrospective cohort studies or untreated control groups in RCTs	SR (with homogeneity*) of Level >2 diagnostic studies	SR (with homogeneity*) of 2b and better studies	SR (with homogeneity*) of Level >2 economic studies
2b	Individual cohort study (including low quality RCT; e.g., <80% follow-up)	Retrospective cohort study or follow-up of untreated control patients in an RCT; Derivation of CDR† or validated on split-sample § § § only	Exploratory** cohort study with good†††reference standards; CDR† after derivation, or validated only on split-sample § § § or databases	Retrospective cohort study, or poor follow-up	Analysis based on clinically sensible costs or alternatives; limited review(s) of the evidence, or single studies; and including multi-way sensitivity analyses
2c	"Outcomes" Research; Ecological studies	"Outcomes" Research		Ecological studies	Audit or outcomes research
3a	SR (with homogeneity*) of case-control studies		SR (with homogeneity*) of 3b and better studies	SR (with homogeneity*) of 3b and better studies	SR (with homogeneity*) of 3b and better studies
3b	Individual Case-Control Study		Non-consecutive study; or without consistently applied reference standards	Non-consecutive cohort study, or very limited population	Analysis based on limited alternatives or costs, poor quality estimates of data, but including sensitivity analyses incorporating clinically sensible variations
4	Case-series (and poor quality cohort and case-control studies § § )	Case-series (and poor quality prognostic cohort studies****)	Case-control study, poor or non-independent reference standard	Case-series or superseded reference standards	Analysis with no sensitivity analysis
5	Expert opinion without explicit critical appraisal, or based on physiology, bench research or "first principles"	Expert opinion without explicit critical appraisal, or based on physiology, bench research or "first principles"	Expert opinion without explicit critical appraisal, or based on physiology, bench research or "first principles"	Expert opinion without explicit critical appraisal, or based on physiology, bench research or "first principles"	Expert opinion without explicit critical appraisal, or based on economic theory or "first principles"



Dr. Thomas Fuller 1654-1734  
Gnomologia, 1732

” Get the facts, or the facts will get you. And when you get them, get them right, or they will get you wrong. ”

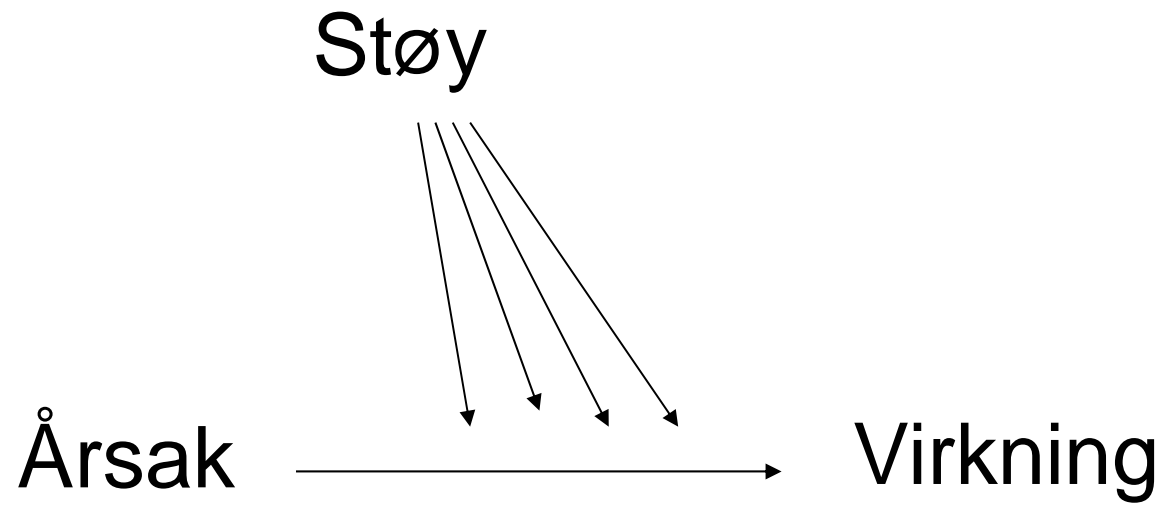
## Dagens vitenskaplige kunnskapsbase



# Ekstern validitet

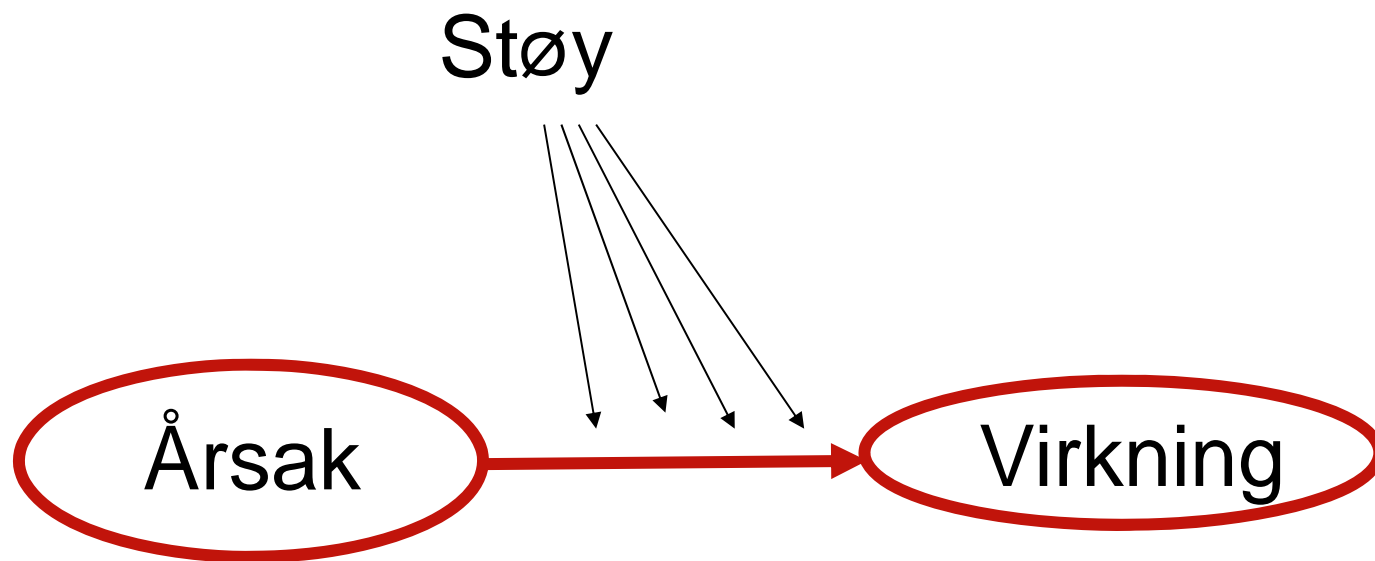


Årsak → Virkning

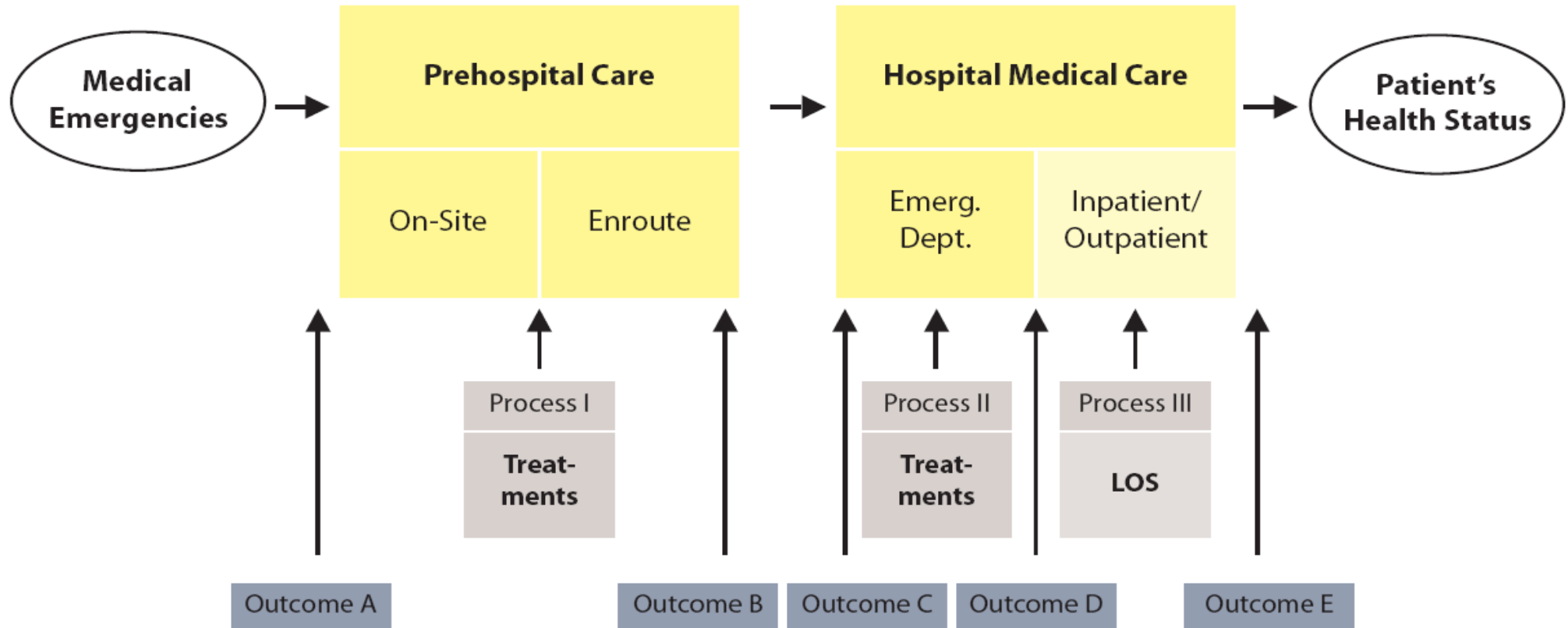


# Støy

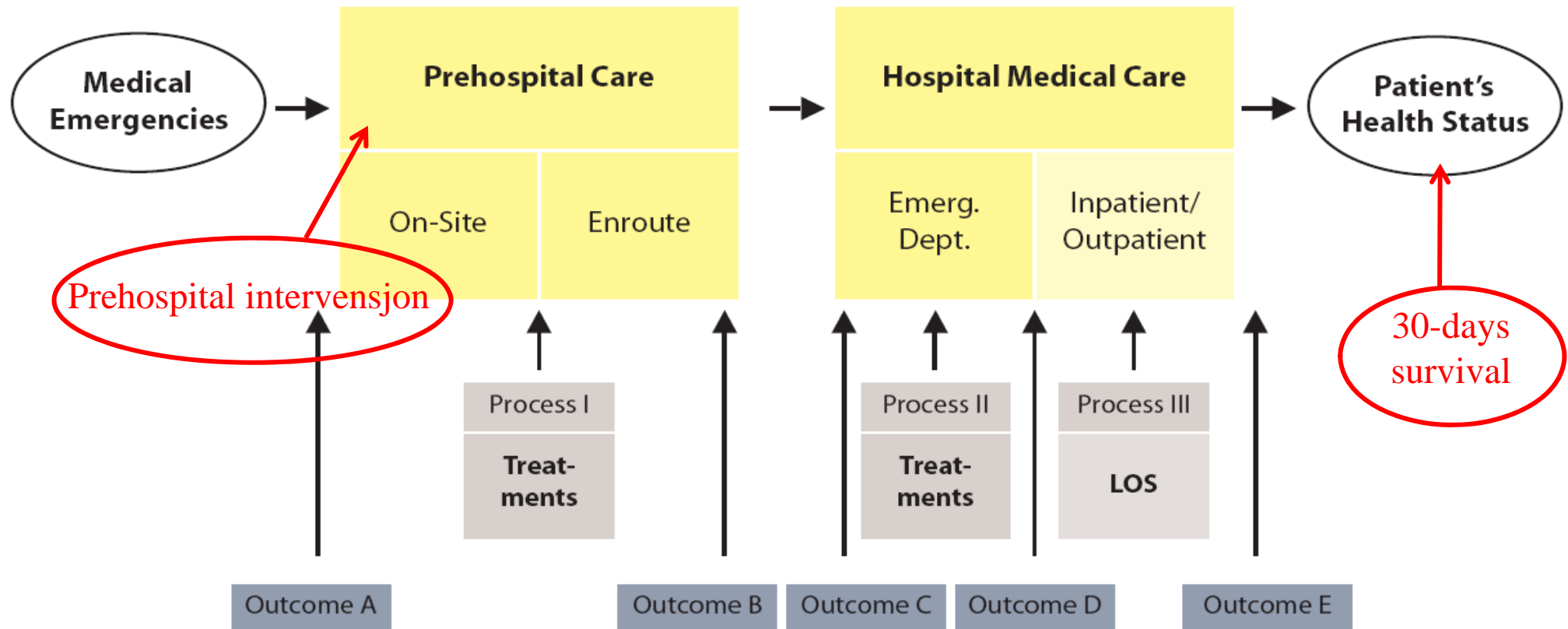
- Upresise definisjoner
- Upresise endepunkt
- Studiepopulasjonen
- ”Studentene” – forutinntatt....
- Hawthorn effekt
- Andre.....



# The challenge is to isolate the effect.



# The challenge is to isolate the effect.



Det er en økende forståelse for kompleksiteten i  
akuttmedisinske intervensjoner

*complex interventions in the critical cascade*

.... noe som igjen øker kompleksiteten ved valg av valide  
kvalitetsindikatorer eller valide outcome parametre



Original research

Open Access

The Utstein template for uniform reporting of data following major trauma: A joint revision by SCANTEM, TARN, DGU-TR and RITG

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Abstract

Background: In 1999, an Utstein Template for Uniform Reporting of Data following Major Trauma was published. Few papers have since been published based on this template, reflecting a lack of international consensus on its feasibility and use. The aim of the present revision was to further develop the Utstein Template, particularly with a major reduction in the number of core data variables and the addition of more precise definitions of data variables. In addition, we wanted to define a set of inclusion and exclusion criteria that will facilitate uniform comparison of trauma cases.

Methods: Over a ten-month period, selected experts from major European trauma registries and organisations carried out an Utstein consensus process based on a modified nominal group technique.

Results: The expert panel concluded that a New Injury Severity Score > 15 should be used as a single inclusion criterion, and five exclusion criteria were also selected. Thirty-five precisely defined core data variables were agreed upon, with further division into core data for Predictive models, System Characteristic Descriptors and for Process Mapping.

Conclusion: Through a structured consensus process, the Utstein Template for Uniform Reporting of Data following Major Trauma has been revised. This revision will enhance national and international comparisons of trauma systems, and will form the basis for improved prediction models in trauma care.



Original research

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A consensus-based template for uniform reporting of data from pre-hospital advanced airway management

Address: 1 Department of Research and Development, Norwegian Air Ambulance Foundation, Drøbak, Norway; 2 Air Ambulance Department, Oslo University Hospital, Oslo, Norway; 3 London HEMS, The Royal London Hospital, London, UK and 4 Department of Surgical Sciences, University of Bristol, Norway

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Background: Advanced airway management is a critical intervention that can harm the patient if performed poorly. The available literature on this subject is rich, but it is difficult to interpret due to a huge variability and poor definitions. Several initiatives from large organisations concerned with airway management have recently propagated the need for guidelines and standards in pre-hospital airway management. Following the path of other initiatives to establish templates for uniform data reporting, like the many Utstein-style templates, we initiated and carried out a structured consensus process with international experts to establish a set of core data points to be documented and reported in cases of advanced pre-hospital airway management.

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inPress



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Kjetil C Ringdal<sup>1,2</sup>, Timothy J Coats<sup>3</sup>, Rolf Lefering<sup>4</sup>, Stefano Di Bartolomeo<sup>5</sup>, Petter Andreas Steen<sup>2</sup>, Olav Røise<sup>6</sup>, Lauri Handolin<sup>7</sup>, Hans Morten Lossius<sup>1</sup> and Utstein TCD expert panel

Address: <sup>1</sup>Department of Research, Norwegian Air Ambulance Foundation, Østfold, Norway; <sup>2</sup>Faculty of Medicine, Faculty Division Ullevål University Hospital, University of Oslo, Norway; <sup>3</sup>Academic Unit of Emergency Medicine, Leicester University, UK; <sup>4</sup>Institute for Research in Operative Medicine, University of Würzburg, Kollektiv-Notfallmedizin, Germany; <sup>5</sup>Unit of Hygiene and Epidemiology, DPMSC, School of Medicine, University of Udine, Italy; <sup>6</sup>Orthopaedic Centre, Ullevål University Hospital, Oslo, Norway and <sup>7</sup>Department of Orthopedics and Traumatology, Helsinki University Central Hospital, Finland

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## Alvorlig skadde

- 35 kjernedata
- Publisert i 2008
- Implementert ved ca 550 traumesykehus
- Implementert i de tre største nasjonale traumeregistre i Europa
- Har gjennomført reliabilitetstesting av enkeltvariabler

**A consensus-based template for uniform reporting of data from pre-hospital advanced airway management**  
Stephen JM Sollid<sup>1,2</sup>, David Lockey<sup>3</sup>, Hans Morten Lossius<sup>1,4</sup> and Pre-hospital advanced airway management expert group

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Email: Stephen JM Sollid<sup>\*</sup> - [sollid@nafa.no](mailto:sollid@nafa.no); David Lockey - [david.lockey@rlh.nhs.uk](mailto:david.lockey@rlh.nhs.uk); Hans Morten Lossius - [hlossus@nafa.no](mailto:hlossus@nafa.no); Pre-hospital advanced airway management expert group - [sollid@nafa.no](mailto:sollid@nafa.no)

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**Abstract**

**Background:** Advanced airway management is a critical intervention that can harm the patient if performed poorly. The available literature on this subject is rich, but it is difficult to interpret due to a huge variability and poor definitions. Several initiatives from large organisations concerned with airway management have recently propagated the need for guidelines and standards in pre-hospital airway management. Following the path of other initiatives to establish templates for uniform data reporting, like the many Utstein-style templates, we initiated and carried out a structured consensus process with international experts to establish a set of core data points to be documented and reported in cases of advanced pre-hospital airway management.

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Page 1 of 14

(page number not for citation purposes)



# Avansert prehospital luftveishåndtering

- 23 kjernedata
- Publisert i 2009
- Implementert ved flere skandinaviske LAT
- Basis for en stor internasjonal multisenterstudie



## Spesialistlegebemannet utrykningstjeneste

- 38 kjernedata
- In press i 2011
- Implementert ved flere skandinaviske LAT
- Del av et omfattende prosjekt for å utvikle et verktøy for kontinuerlig monitorering av legebemannet utrykningstjeneste.



Andreas J. Krüger  
PhD 2008-12

## The Scandinavian pre-hospital physician manned EMS Outcome Study *NTNU / NLA / Karolinska Institutet / ScanDoc Network*

*- Jeg ønsker å finne ut hvordan vi best mulig kan utnytte spesialutdannede akuttleger utenfor sykehus. Jeg ønsker å belyse hvilke pasientgrupper som har mest å tjene på denne begrensede ressursen. Min forskning er et felles skandinavisk prosjekt som vil belyse hvordan leger brukes i dag, og identifisere faktorer som gir økt gevinst av utrykningstjeneste med akuttleger.*

**Veiledere:**

**HM Lossius UiB, E Skogvoll NTNU, M Castren KI  
Sverige**



## Fire trinns modifisert nominell gruppeteknikk

Trinn 1: Forslag innhentes på e-post

Trinn 2: Revideres og rangeres i ny e-post runde

Trinn 3: Konsensusmøte

Trinn 4: Endelig godkjenning og siste kommentarer per e-post

### Feilkilder

- Sammensetning av panel
- Seleksjon av litteratur
- Dominerende personer

Fokusere på et lite og overkommelig antall kjernedata

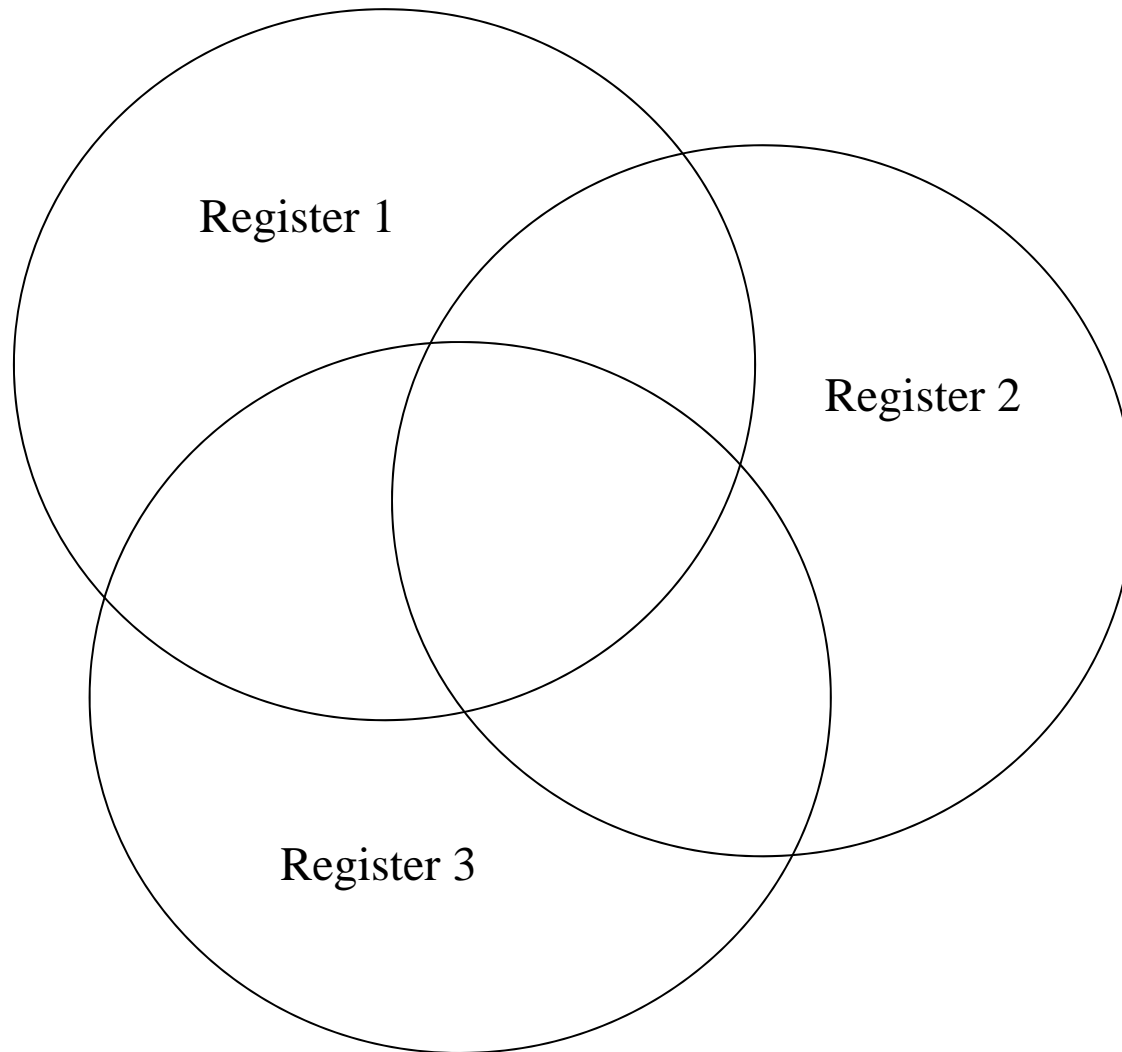
### Strukturering av variablene

- Variabelnummer (unikt)
- Variabelnavn (unikt)
- Variabel type
- Variabel definisjon
- Variabel kategorier
- Variabel kilde
- Utfyllende kommentarer

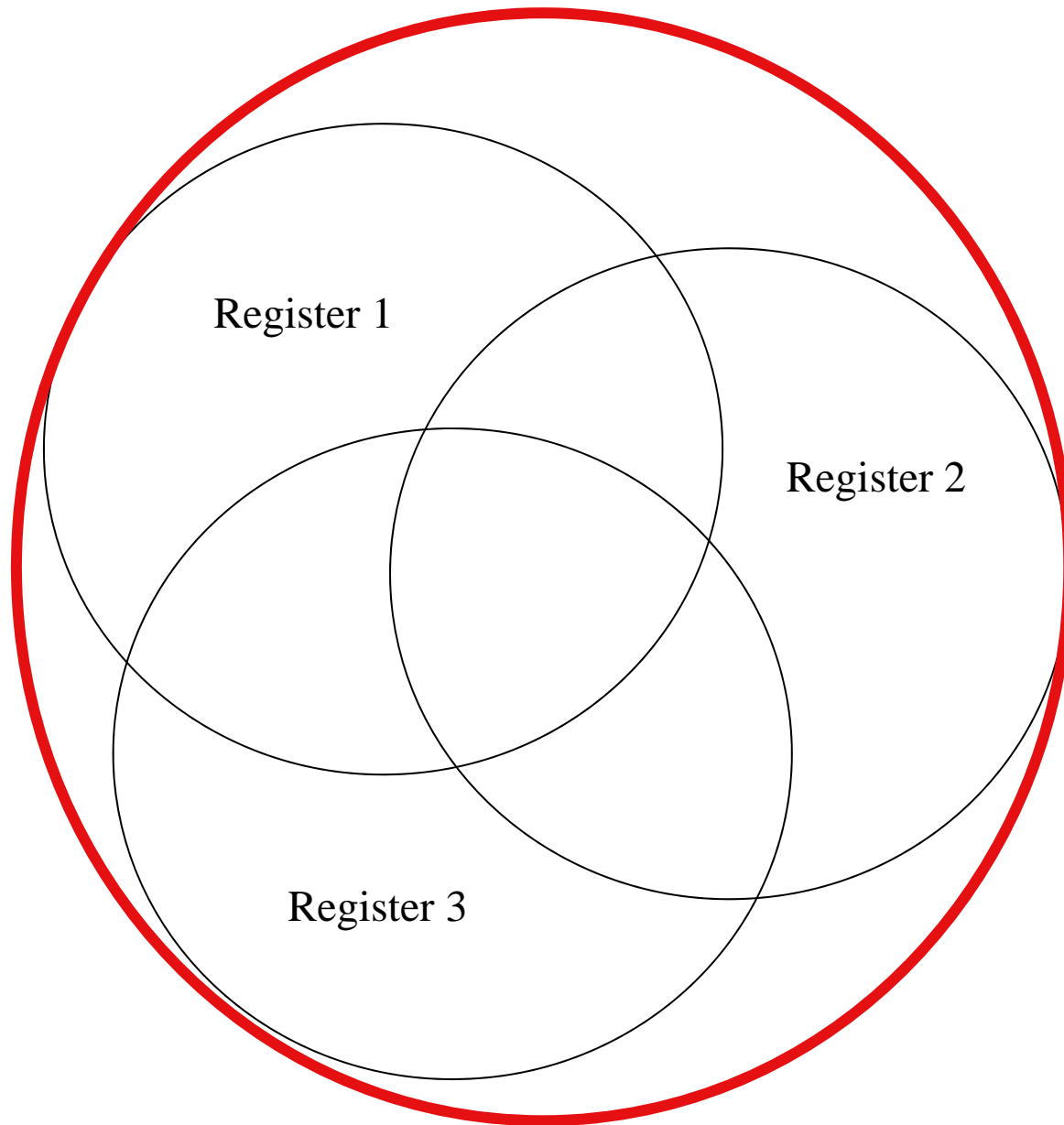
## Inndeling av data

- Fixed system variables
- Event operational descriptors
- Patient descriptors
- Process mapping
- Outcome and quality indicators

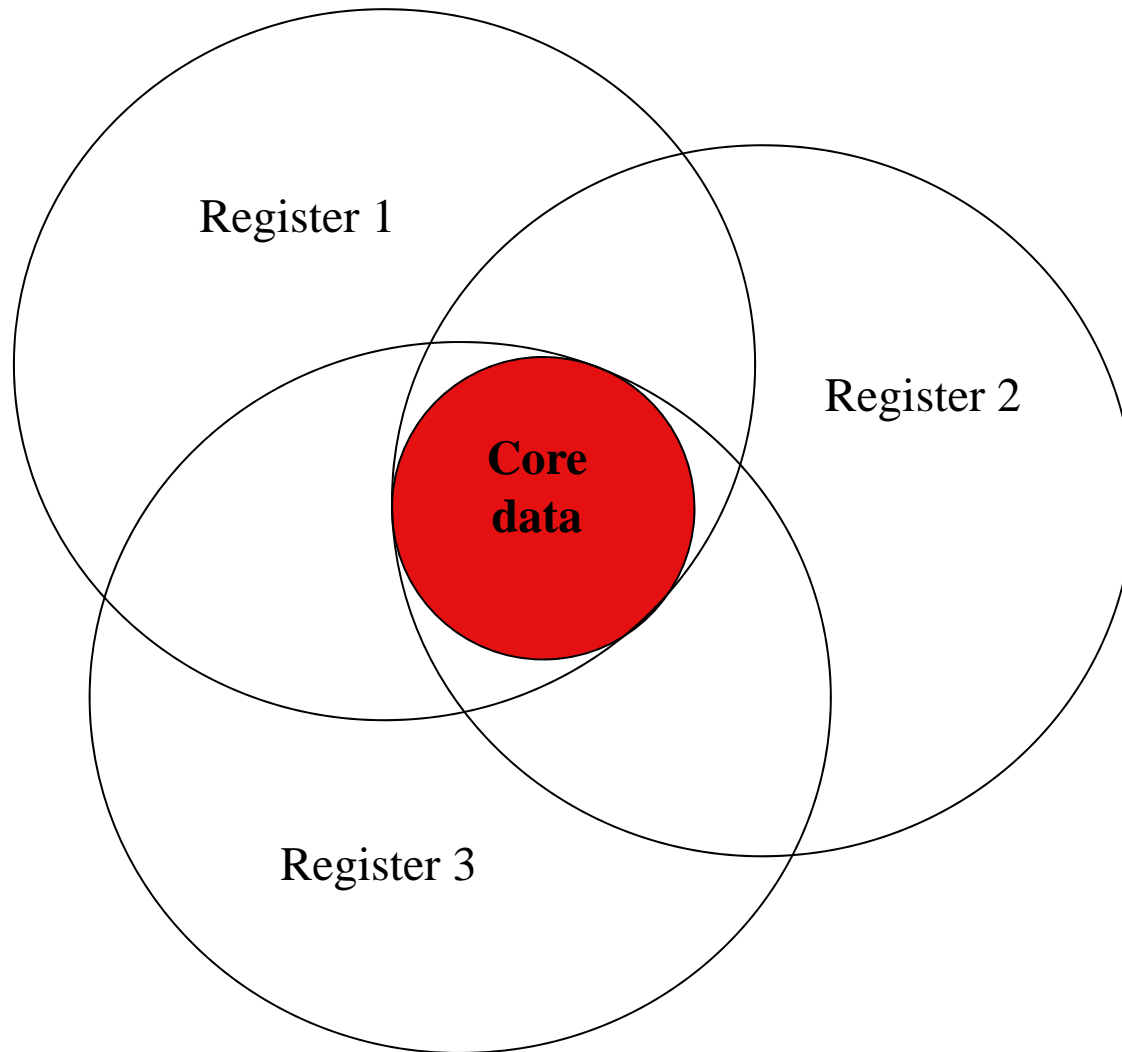
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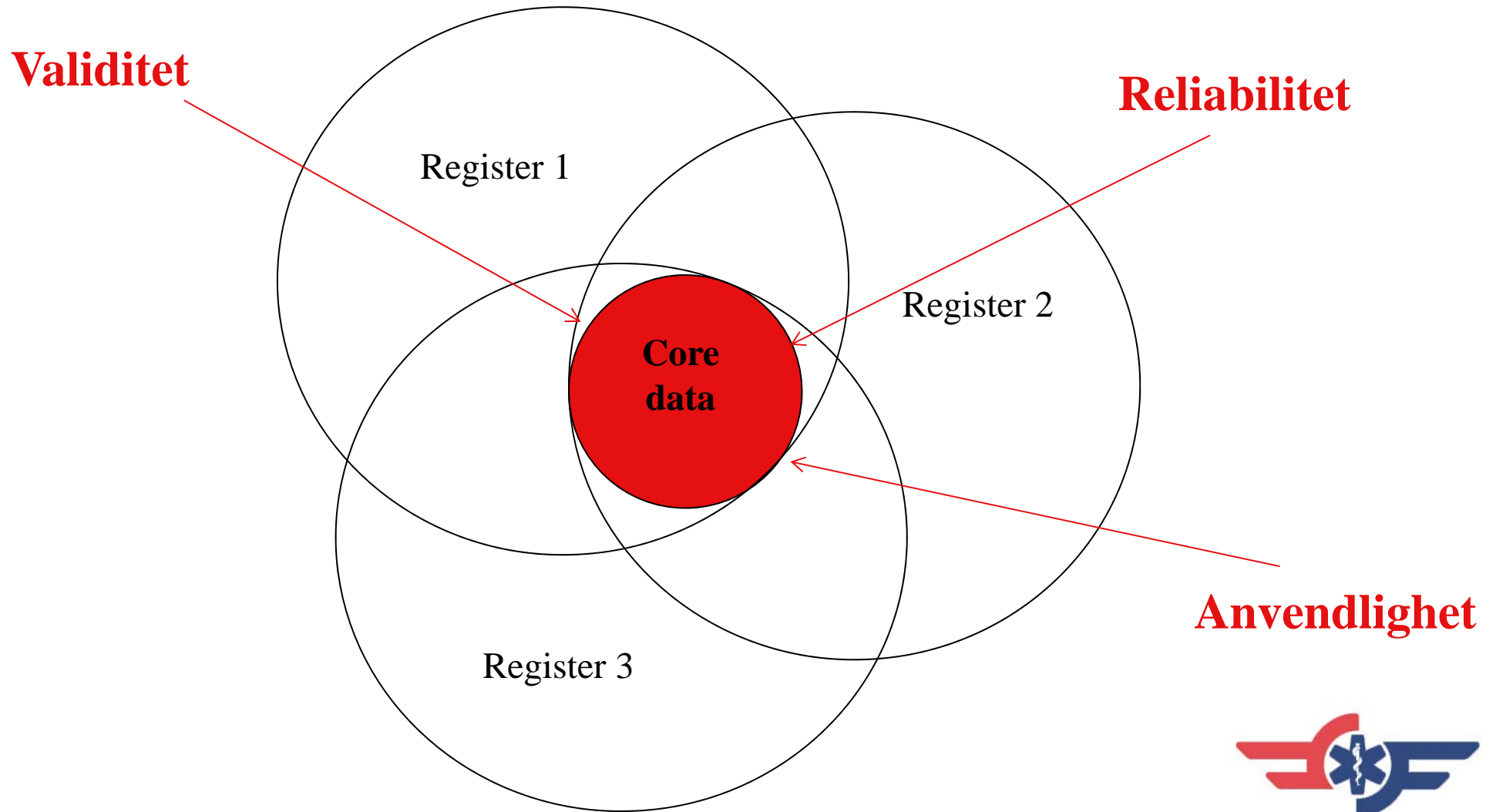
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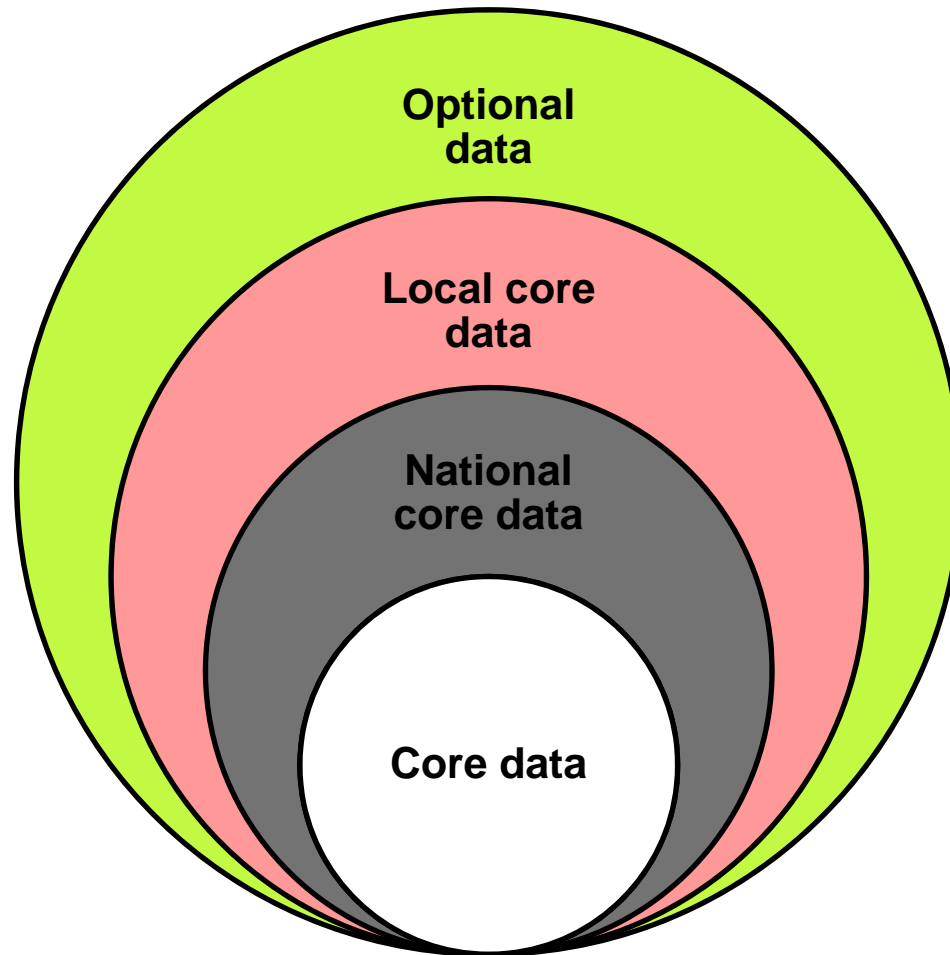


# Datadefinisjonsprosessen



# Datadefinisjonsprosessen







# Pre-hospital ETI

Original research

Open Access

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Stephen JM Sollid<sup>\*1,2</sup>, David Lockey<sup>3</sup>, Hans Morten Lossius<sup>1,4</sup> and Pre-hospital advanced airway management expert group

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## Revisiting the value of pre-hospital tracheal intubation: an all time systematic literature review extracting the Utstein airway core variables

Hans Morten Lossius<sup>1,2\*</sup>, Stephen JM Solland<sup>1,2,3</sup>, Marius Rehn<sup>1,4,5</sup>, David J Lockey<sup>6,7</sup>

### Abstract

**Introduction:** Although tracheal intubation (TI) in the pre-hospital setting is regularly carried out by emergency medical service (EMS) providers throughout the world, its value is widely debated. Heterogeneity in procedures, providers, patients, systems and stated outcomes, and inconsistency in data reporting make scientific reports difficult to interpret and compare, and the majority are of limited quality. To hunt down what is really known about the value of pre-hospital TI we determined the rate of reported Utstein airway variables (28 core variables and 12 fixed-system variables) found in current scientific publications on pre-hospital TI.

**Methods:** We performed an all time systematic search according to the PRISMA guidelines of Medline and EMBASE to identify original research pertaining to pre-hospital TI in adult patients.

**Results:** From 1,076 identified records, 73 original papers were selected. Information was extracted according to an Utstein template for data reporting from in-the-field advanced airway management. Fifty-nine studies were from North American EMS systems. Of these, 46 (78%) described services in which non-physicians conducted TI. In 12 of the 13 non-North American EMS systems, physicians performed the pre-hospital TI. Overall, two were randomised controlled trials (RCTs), and 65 were observational studies. None of the studies presented the complete set of recommended Utstein airway variables. The median number of core variables reported was 10 (max 21, min 2, IQR 8-12), and the median number of fixed system variables was 5 (max 11, min 0, IQR 4-8). Among the most frequently reported variables were "patient category" and "service mission type", reported in 86% and 71% of the studies, respectively. Among the least-reported variables were "co-morbidity" and "type of available ventilator", both reported in 2% and 1% of the studies, respectively.

**Conclusions:** Core data required for proper interpretation of results were frequently not recorded and reported in studies investigating TI in adults. This makes it difficult to compare scientific reports, assess their validity, and extrapolate to other EMS systems. Pre-hospital TI is a complex intervention, and terminology and study design must be improved to substantiate future evidence based clinical practice.

### Introduction

Tracheal intubation (TI) to secure the airway of severely ill or injured patients is a critical intervention regularly conducted by emergency medical service (EMS) providers throughout the world. This activity is based on the assumption that, in keeping with in-hospital practice, a compromised airway should be secured as early as possible to ensure adequate ventilation and oxygenation. However,

because pre-hospital environmental and infrastructural factors can be challenging, intubation success rates are variable [1]. When TI is performed incorrectly, it can provoke adverse events and may worsen outcome in some patient groups [2-4]. Even when performed correctly, sub-optimal ventilation following TI may increase the risk of fatal outcomes in certain patient subgroups [5-9].

The use of pre-hospital TI is widely debated [see Additional data file 1], but the majority of TI-related studies are thought to be of limited value [10-12]. The core question therefore remains unanswered: does TI in the pre-hospital setting fail or result in adverse events at

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# Revisiting the value of pre-hospital tracheal intubation: an all time systematic literature review extracting the Utstein airway core variables.

- Identifisere originale arbeider om pre-hospital PH TI
- Systematisk litteratur gjennomgang (PRISMA)
- Vi identifiserte 73 artikler (all time) på utfall/effekt av PH TI
- Median antall Utstein variabler rapportert var 10 (maks 21, min 2)
- Kun 3 artikler rapporterte post intervention ETCO<sub>2</sub> og 8 rapporterte post intervention SaO<sub>2</sub>!

## Revisiting the value of pre-hospital tracheal intubation: an all time systematic literature review extracting the Utstein airway core variables

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### Abstract

**Introduction:** Although tracheal intubation (TI) in the pre-hospital setting is regularly carried out by emergency medical service (EMS) providers throughout the world, its value is widely debated. Heterogeneity in procedures, providers, patients, systems and stated outcomes, and inconsistency in data reporting make scientific reports difficult to interpret and compare, and the majority are of limited quality. To hunt down what is really known about the value of pre-hospital TI we determined the rate of reported Utstein airway variables (28 core variables and 12 fixed-system variables) found in current scientific publications on pre-hospital TI.

**Methods:** We performed an all time systematic search according to the PRISMA guidelines of Medline and EMBASE to identify original research pertaining to pre-hospital TI in adult patients.

**Results:** From 1,076 identified records, 73 original papers were selected. Information was extracted according to an Utstein template for data reporting from in-the-field advanced airway management. Fifty-nine studies were from North American EMS systems. Of these, 46 (78%) described services in which non-physicians conducted TI in 12 of the 13 non-North American EMS systems, physicians performed the pre-hospital TI. Overall, two were randomised controlled trials (RCTs), and 65 were observational studies. None of the studies presented the complete set of recommended Utstein airway variables. The median number of core variables reported was 10 (max 21, min 2, IQR 8-12), and the median number of fixed system variables was 5 (max 11, min 0, IQR 4-8). Among the most frequently reported variables were "patient category" and "service mission type", reported in 86% and 71% of the studies, respectively. Among the least-reported variables were "comorbidity" and "type of available ventilator", both reported in 2% and 1% of the studies, respectively.

**Conclusions:** Core data required for proper interpretation of results were frequently not recorded and reported in studies investigating TI in adults. This makes it difficult to compare scientific reports, assess their validity, and extrapolate to other EMS systems. Pre-hospital TI is a complex intervention, and terminology and study design must be improved to substantiate future evidence based clinical practice.

### Introduction

Tracheal intubation (TI) to secure the airway of severely ill or injured patients is a critical intervention regularly conducted by emergency medical service (EMS) providers throughout the world. This activity is based on the assumption that, in keeping with in-hospital practice, a compromised airway should be secured as early as possible to ensure adequate ventilation and oxygenation. However,

because pre-hospital environmental and infrastructural factors can be challenging, intubation success rates are variable [1]. When TI is performed incorrectly, it can provoke adverse events and may worsen outcome in some patient groups [2-4]. Even when performed correctly, sub-optimal ventilation following TI may increase the risk of fatal outcomes in certain patient subgroups [5-9].

The use of pre-hospital TI is widely debated [see Additional data file 1], but the majority of TI-related studies are thought to be of limited value [10-12]. The core question therefore remains unanswered: does TI in the pre-hospital setting fail or result in adverse events at

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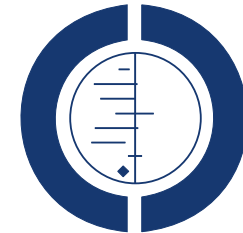
Core data required for proper interpretation of results were frequently not recorded and reported and this makes it difficult to compare scientific reports, assess their validity, and extrapolate to other EMS systems.

# Pre-hospital ETI

- Cochrane rapport basert på tre(!) publikasjoner
- Ingen påvist positiv effekt
- Etterlyser fler studier

## Emergency intubation for acutely ill and injured patients (Review)

Lecky F, Bryden D, Little R, Tong N, Moulton C



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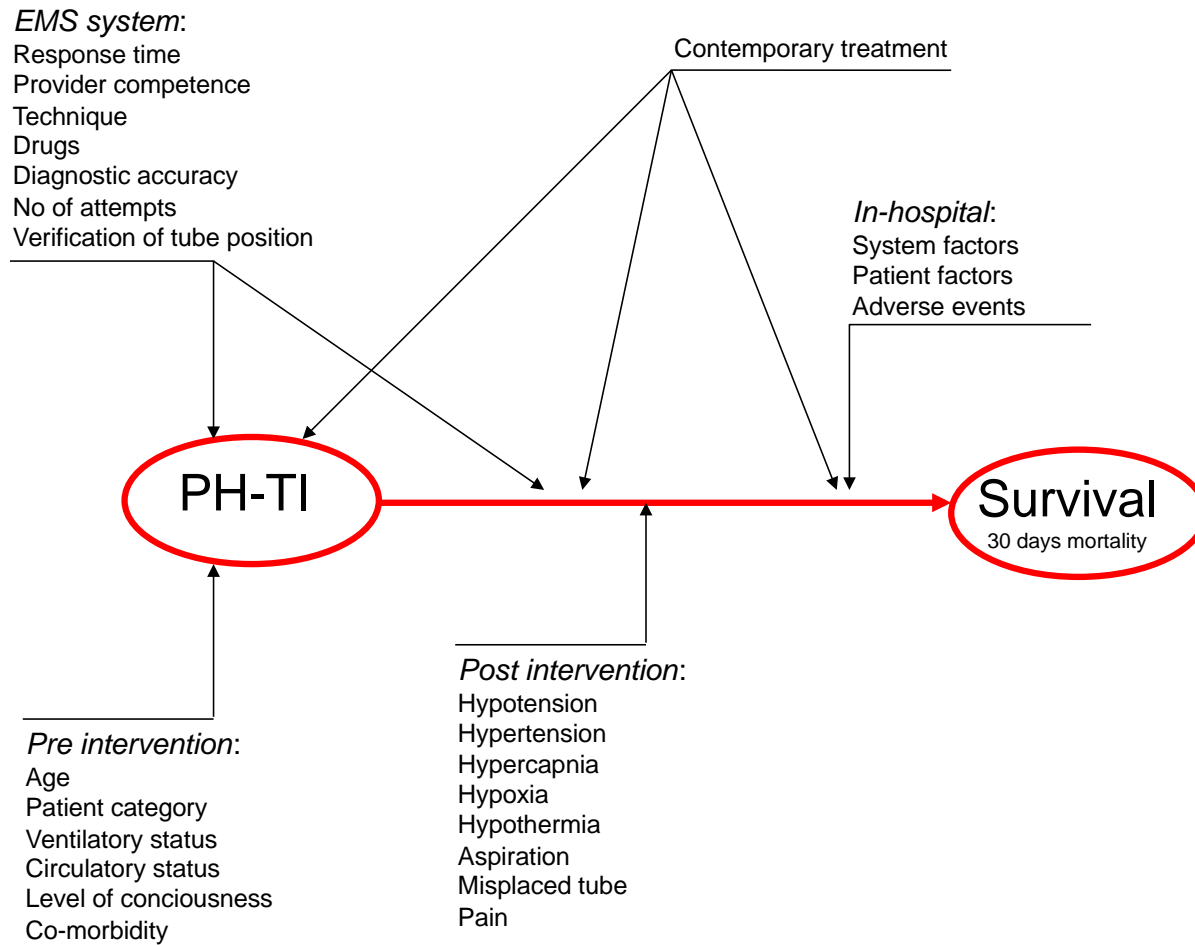
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Emergency intubation for acutely ill and injured patients (Review)  
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# Complex intervention



To forskellige løgne  
dem skal man ikke tro, selv om man legger dem sammen  
og dividerer med to

Men af to forskellige løgne  
kan der komme en sandhed frem, hvis man trekker dem fra hinanden  
og dividerer med fem

*Piet Hein*



