Video stroboscopy and high-speed films of pathological voices

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Research in clinical practice

- How do we come to make the best possible choices in the clinical practice?
- When introducing new technology the benefits are yet to be fully understood
- In the clinic we strive to deliver the best clinical service by basing treatment on evidence and expand the evidence where possible

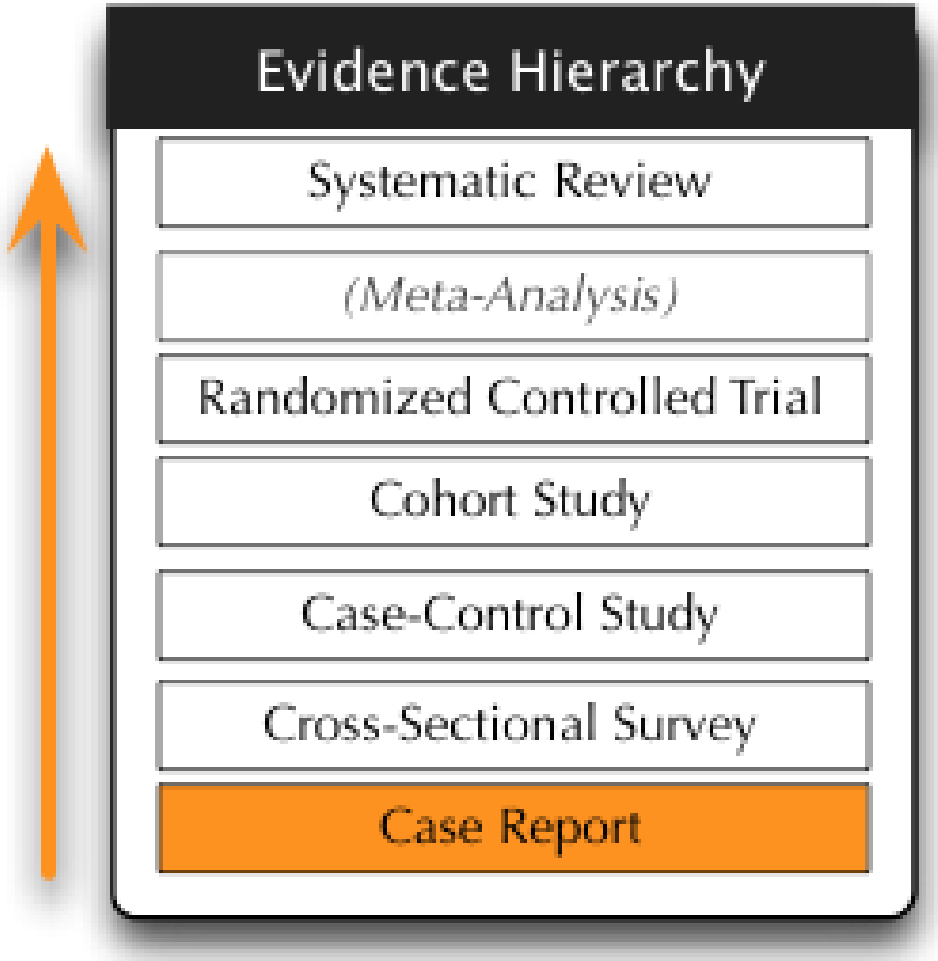
Building a Hypothesis

- The high speed films are better than the videostroboscopy
  - The knowns:
    - Possible to see the vocal cords movement with high speed films (4.000 per sec) in more details than the average pictures provided by the videostroboscopy (25 per sec)
  - The unkowns:
    - How often is there a difference
    - What is the relevance of the difference

Show picture motions

- Vocal cords move
  - in a man ~110 Hz (pictures per second)
  - in a woman ~220 Hz (pictures per second),
- Magic flute (trylleføjten), the high F is ~1300 Hz
- Looking at 25 pictures per second will not show the true motion of the vocal cords movement

Evidence hierarchy



Evidence hierarchy, examples

Type	Examples
Case report	Description of individuals: A patient took medication A and it cured disease B (but no proof what caused disease B to be cured)
Cross-Sectional Survey	Looking at a representative sample here and now: How many takes medication A and do not have disease B.
Case-Control Study	Looking at patient with a certain disease and patients matching these patients except for the disease
Cohort Study	Comparing people born during WW2 with people born afterwards. Or people born before and after legalisation of abortion. Or number of Symbicort prescriptions before and after high speed films have been introduced.
Randomized Controlled Trial	Isolation of effect. All other differences are random and thus statistically controllable.
Meta-Analysis	Summary of results of several trials
Systematic Review	Summary of results of all relevant trials

How to prove that one type of examination is better than another one?

- What to measure?
  - Considering the SMART goal criteria:
    - Specific
    - Measureable
    - Achievable
    - Relevant
    - Timely
- How to compare the examinations?
  - Design and analysis

Relevant, yes, but for whom?

Patient	Investigator
Getting the best treatment with minimal personal risk Minimize the discomfort of the examination (Quality of Life)	Understand root cause for pathological voice (symptoms)
Society (samfundet)	Regulator (myndigheden)
Minimize use of antibiotics Minimize number of sick days Minimize cost for treatment and examination	Want the cheepest possible examination Safest possible examination Acceptable reliability of examination

Design of study

- Including patients in the clinic with a hoarse voice
- Assessing each patient with both high speed films and videostroboscopy in a random sequence
- Assessing arytenoids-region oedema score (1-5), vocal cord abnormalities, front, middle and rear, suggested treatment after each examination (either video-stroboscopy or high speed film) before proceeding
- Comparing for each patient the **diagnosis given** based on each of the examinations (either video-stroboscopy or high speed film) and ultimately the corresponding **treatment**

Scientific evidence

		Videostroboscopy	
		No voice hygiene or symbicort	Voice hygiene or symbicort
High speed	No voice hygiene or symbicort	12	5
	Voice hygiene or symbicort	0	2

In the logistic regression model where the correlation between the two assessments on the same patient is taken into account, the two sided p-value is 0.0190 when comparing videostroboscopy with high speed, showing a statistically significant higher proportion of patients where treatment involves either voice hygiene or symbicort (cortisone and adrenaline locally in the throat) when assessed using videostroboscopy compared to assessment using high speed.