

# Understanding NNT- Patient's and Physicians Perspective

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# Number needed to treat - NNT

- Useful yardstick to describe harm as well as benefit of therapy and other clinical maneuvers.
- NNT is more useful than RRR., OR as it
  - ❖ Incorporates baseline risk
  - ❖ Risk reduction with therapy

*Laupacis, Sackett, Roberts*  
*NEJM 1988;318:1728*

# NNT

“ tells clinicians and patients in more concrete terms how much effort they must expend to prevent one event, thus allowing comparisons with the amount of effort that must be expended to prevent the same or other events in patients with other disorders.”

*Laupacis, Sackett, Roberts*  
*NEJM 1988;318:1728*

# Reporting NNT in journals.

5 frequently cited journals :

Annals, BMJ, NEJM, JAMA, The Lancet ( 1989-1998)

Out of 356 eligible articles,

NNT reported in 8 articles ( 6/8 from 1998)

ARR reported in 18 articles ( 10/18 from 1998)

*JAMA 2002; 287:2813*

# Background:

Few studies have been performed enquiring the ability of patient's and physicians not trained in EBM, to understand NNT

# Objectives

- 1) To determine how often patients and physicians understand the concept of NNT
- 2) To determine the limitation(s) of NNT

# Methods:

- ❖ Relevant articles identified by searching various database
  - Medline 1980-2003
  - Embase 1988-2003
  - Psychinfo 1984-3003
  - Web of Science 1993-2003
  - Educational websites, Bibliography
- ❖ Study design, quality of study, limitations abstracted by 2 independent reviewers

# Methods

## Exclusion Criteria:

- Review articles on therapy
- Studies on efficacy of EBM workshops



# Results:

Randomized , cross sectional survey

62 First year medical students, UNC at Chapel Hill Medical School

Data presented as RRR, ARR, NNT, combination

61% accurately interpreted qualitative data

Interpretative data was lower with NNT format ( 25% Vs 75%)

*Sheridan & Pignone*  
*Eff Clin Pract 2002;5:35-40*

# NNT interpretation

Face to face interview of 675 Danish Patients (20-74)

- ❖ Hypothetical drug which reduce risk of heart attack
- ❖ Presented as NNT 10, 25, 50, 100, 200, 400
- ❖ 80% consented to treatment irrespective of NNT
- ❖ Older patients, married, less educated ,more willing to consent to treatment

Kristiansen, et.al.

J Clin Epidemiol 2002;55:888

# NNT interpretation.

50 GP's from Sydney, Australia

Self administered questionnaires

would not be helpful to understand

I don't understand but would like to

I have understanding

I have understanding and can explain

Interviewed by one reviewer's unaware of the scores

3 expert reviewers agreed on criteria to establish competence

*Young, Glasziou, Ward  
BMJ 2002;324:950*

# NNT

**Self report:**

**I have understanding and can explain : 8/50**

**Expert criteria review :**

**0 ( ALL criteria), 2(some criteria)**

*Young, Glasziou, Ward  
BMJ 2002;324:950*

# NNT vs RRR and ARR

4 studies ( 3 physicians , 1 patient\*)  
all indicate the preference of

**RRR>ARR>NNT**

*BMJ 2002;324:950*

*BMJ 1994;309:761*

*\*Am J Med 1992;92:121*

*Med Dec Making 1995;15:152*

# Studies exploring limitations of NNT

- ❖ NNT is akin to a lottery , where patient's chances of benefit  $1/\text{NNT}$
- ❖ NNT expresses benefit at single time point and will vary with time
- ❖ Despite benefits in therapy NNT may not be significant, if point of measurement is delayed!
- ❖ Patient consider therapy despite size of NNT when side-effects are low

Kristiansen, et.al.  
J Clin Epidemiol. 2002;55:888

# Limitations of NNT

## NNT for 3 cardiac Interventions:

Cardiac transplantation: (1)

Implantable cardioverter defibrillators(ICD): (4)

Lowering cholesterol by 10% : (600)

## Actual reduction of CV mortality in population:

Cardiac transplantation: (0.9%)

Implantable cardioverter defibrillators(ICD): (1.1%)

Lowering cholesterol by 10% : (4.8-7.8%)

J Clin Epidemiol 2001;54:111

# NNT limitations.

## **NNT misleading when interventions being compared**

- ❖ Have Effects over different period of time
- ❖ Applied to different populations and subpopulation

## **NNT works:**

Comparing 2 or more treatments, over same time period  
And similar populations/patients.

J Clin Epidemiol 2001;54:111



# Conclusions:

- 1) Despite numerous studies revealing efficacy of teaching EBM, understanding of NNT among patients and physicians is limited.
- 2) Risk communication involving only NNT may not provide adequate information in some settings
- 3) Limitations of NNT should be stressed during instruction

# Limitations of our study

- ❖ Limited number of studies
- ❖ Study design and quality of educational research was variable.
- ❖ Limited acceptance of educational articles by reputed journals ( publication bias?)