



# Refining access to health information using a novel indexing approach.

**P**atient-population-problem,  
**E**xposure-intervention, **C**omparison,  
**O**utcome, **D**uration, & **R**esults

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# Questions

**Unstructured = Unanswerable**

**Make them structured**

- P Do women > 50 years
- E taking calcium
- C compared to women taking nothing
- O have fewer hip fractures
- D over 5 years
- R NNT of 30

# Does PECODR exist in abstracts?

Pilot study

Convenience sample (N = 40)

- 20 research articles (Evidence Based Medicine **synopses**)
- 20 corresponding **abstracts** (PubMed)

Converted the information into a text file

- Independently by two researchers
- Extract text and allocate to a elements
  - **elements made from a word or words,**
    - **made up from a series of characters (the gold standard denominator)**
- 10 rules developed iteratively
  - eg exclusive assignment « 1 extract = 1 element »

Analyse the content: Qualitative and Quantitative

# Results: PECODR by abstracts

docs extra

P	19	89		
E	20	163		
C	18	92	19	120
O	20	169	20	187
D	15	36	18	45
R	20	210	20	187

PECODR exists  
in abstracts

**Total**

**759**

**835**

# Results

## Presence of text or text patterns

- PECODR elements are present in the majority of abstracts with the exception of Duration (75%)

## Patterns of PECODR

- P & E = Medical or Drug Terms (thesaurus)
- The other element related extracts contain some patterns

# Phase II

## Search Engines

- Public and professionals      Google index
- Librarians and researchers      PubMed
  - Keywords/MESH/UMLS
  - PECODR searches -= that use keywords
- None have indexed using PECODR

# Phase I Produce a Vocabulary

- Identify existing taxonomy for the PECODR elements.
- Where necessary generate new taxonomy
- Develop a new controlled vocabulary matching PECODR elements.

## Controlled Vocabulary Development for PECODR elements

PECODR element	Taxonomies available	Taxonomies needed
Patient		Description of gender, age groups, ages,
Population		Ethnic groups, socio economic classifications,
Problem	International Classification of Disease (ICD), WHO International Classification of Primary Care (ICPC), ICPC+	
Exposure & Comparison	Drug databases including allied and complimentary therapies.	Non pharmacological exposures not included in CAMS
Outcome	WHO International classification of functioning, disability and health. Geneva: WHO; 2001.	
Duration		Time variables
Results		Epidemiological terms describing results in quantitative studies e.g. absolute and relative risk reduction, and numbers needed to treat (NNT)



# Phase II Enhancing the Index

- With their rules, Demner Fushman's group at NLM has been able to recognize around 80% of the PECODR elements in MEDLINE abstracts.
- This will be built on by using natural-language processing (GATE).
- The traditional named entity recognition (vocabulary based) can be coupled with domain taxonomy to recognize domain specific concepts

# Phase III Effectiveness

- Is PECODR enhanced index more effective than default search engines with respect to three outcomes:
  - Relevance, Importance and Impact.
- Questions will be obtained from residents & faculty in our teaching units.
- Mixed methods approach
- Employ our validated impact assessment tool

# Impact assessment

WM\_rgrad

File Zoom Tools Help

IIAM (v1.071) 9:11 ok

**What was the impact of this 'item of information' on you or your practice?**  
*B-blockers not first line for HTN in elderly*

Check all that apply: Yes No

My practice was (will be) changed and improved	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I learned something new	<input type="checkbox"/>	<input checked="" type="checkbox"/>
This information confirmed I did (will do) the right thing	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I was reassured	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I recalled something	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I was dissatisfied, as this information had no impact on my practice	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I was dissatisfied, as there was a problem with this information	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I disagree with this information	<input type="checkbox"/>	<input checked="" type="checkbox"/>

WM\_rgrad

File Zoom Tools Help

IIAM (v1.06) 10:09 ok

I recalled something	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I was dissatisfied, as this information had no impact on my practice	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I was dissatisfied, as there was a problem with this information	<input checked="" type="checkbox"/>	<input type="checkbox"/>
I disagree with this information	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I think this information is potentially harmful	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If this 'item of information' had no impact at all on you or your practice, click here	<input type="checkbox"/>	<input type="checkbox"/>

**Information item applied for a specific patient?** Yes No

	<input type="checkbox"/>	<input checked="" type="checkbox"/>
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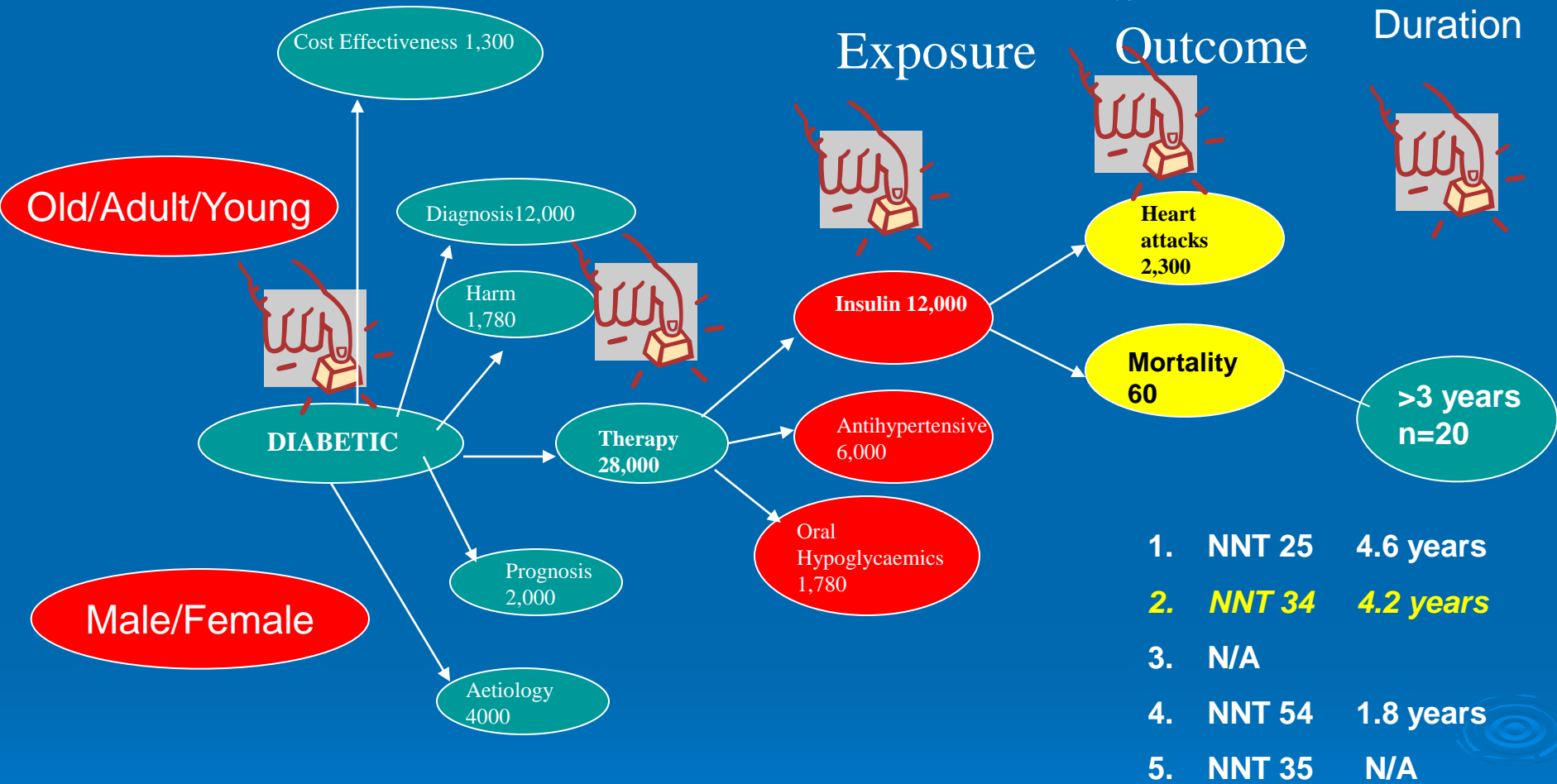
Previous Next

# Problem/Patient

# Select Exposure

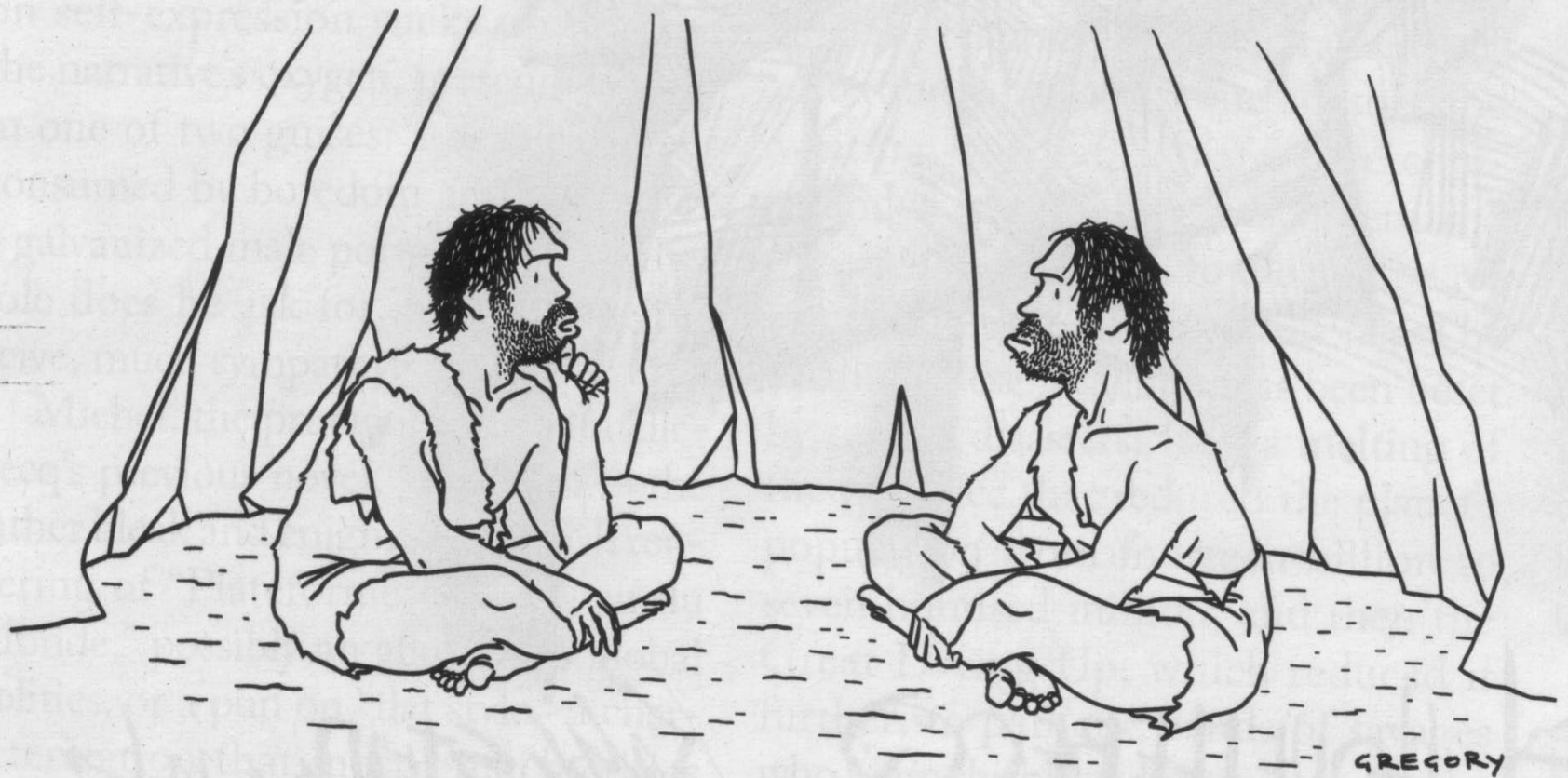
# Select Outcome

# Select Duration



1. NNT 25 4.6 years
2. **NNT 34 4.2 years**
3. N/A
4. NNT 54 1.8 years
5. NNT 35 N/A

Number under each heading represents articles



*“Something’s just not right—our air is clean, our water is pure, we all get plenty of exercise, everything we eat is organic and free-range, and yet nobody lives past thirty.”*