A decorative graphic on the left side of the slide features several triangles in shades of red, purple, and blue, arranged around a central vertical line and a horizontal line that intersects it. The triangles are of various sizes and orientations, creating a dynamic, abstract composition.

Evidence-based Practice for Improving Quality: an introduction

Nalini Singhal
University of Calgary
October 2007



Evidence-based Practice for Improving Quality

- About CNN & EPIQ
- EPIQ QI
- EPIQ study
- Economic impact
- Conclusions



About CNN & EPIQ

Canadian Neonatal Network™

- Founded in 1995
- 30 hospitals & 16 universities across Canada, including all 30 tertiary NICUs in Canada
- Standardized NICU database
- CNN researchers have published extensively in peer-reviewed journals and made many presentations at scientific conferences

Canadian Neonatal Network™

Coordinating Centre

Participating Institutions

Steering Committee

BC Children's & Women's Health Ctr
Centre Hospitalier Universitaire de Québec
Centre Hospitalier Universitaire de
Sherbrooke
Children's Hospital of Eastern Ontario
Everett Chalmers Hospital, Fredericton
Foothills Medical Centre, Calgary
McMaster Children's Hospital, Hamilton
Hospital for Sick Children, Toronto
Hôpital Sainte-Justine, Montréal
IWK Health Centre, Halifax
Janeway Child Health & Rehabilitation Ctr.,
St. John's, Newfoundland
Jewish General Hospital, Montréal
Kingston General Hospital, Ontario

Moncton Hospital, Moncton
Montréal Children's Hospital
Mount Sinai Hospital, Toronto
Regina General Hospital, Regina
Royal Alexandra Hospital, Edmonton
Royal Columbian Hospital, New Westminster
Royal University Hospital, Saskatoon
Royal Victoria Hospital, Montréal
St. Boniface General Hospital, Winnipeg
St. John Regional Hospital, St. John, New
Brunswick
St. Joseph's Health Centre, London
Sunnybrook Health Sciences Ctr., Toronto
Winnipeg Health Sciences Ctr.
Victoria General Hospital, Victoria

Evidence-based Practice for Improving Quality

- Began in 2004, now includes 24 hospitals
- Scientific method for quality improvement
 1. Uses **Evidence** from published literature
 2. Targets **practice to improve quality**, using hospital data
 3. Combines expertise and experiences from Canadian Neonatal Network™
- Inclusive, may be used in all NICUs
- Culture of continuous quality improvement

The logo consists of the letters 'EPIQ' in a blue, sans-serif font. A red circle is positioned around the letter 'Q', with a red arrow pointing from the circle towards the right.A large graphic featuring a red arrow pointing left, overlaid on a blue background with a white horizontal bar. The text 'EPIQ QI' is written in white on the blue background.

EPIQ QI

- Problems with traditional continuous quality improvement (CQI) approaches:
 - Subjective
 - Not always evidence-based
 - Seldom use data from institutions in question
 - Mostly intra-institutional in nature
 - Results are not always “generalizeable”
- We developed EPIC to improve upon traditional CQI approaches

1. Objective
 - *Systematic reviews of evidence*
2. Quantitative analysis
 - *Multi-centre outcomes and practices*
 - *Identifies practices associated with outcome variation that can be targeted for intervention*
3. Utilizes collective multi-disciplinary expertise
 - *Infection control, quality improvement, etc.*

Process of Practice Changes

What are we trying to accomplish?

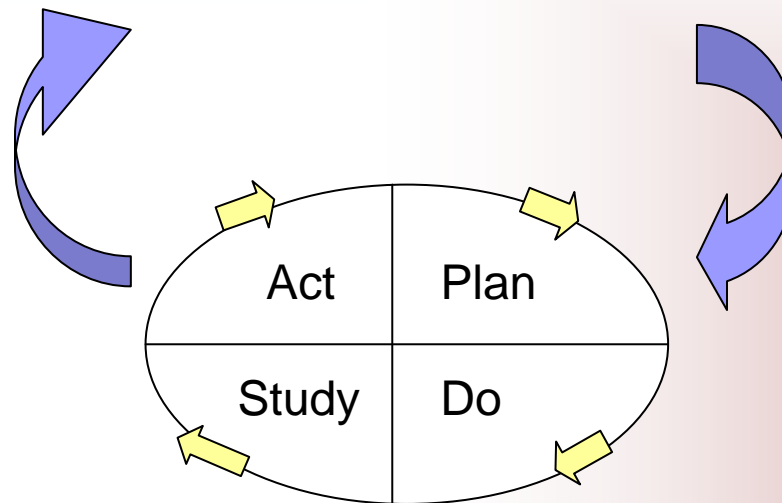
↓NI & BPD rates

How will we know a change is an improvement?

Length of stay, NI/BPD rates, O₂ use, audit etc.

What change can we make that will result in improvement?

e.g. less antibiotic use, pCO₂ within range



1. Describe the **OVERALL AIM** of this Practice Change (e.g. reduce number of skin breaks).

2. Why was this Practice Change selected? **RANK (1 to 5, most to least relevant)** reasons for selecting practice change:

- ___ Patient Data (e.g. CNN data, Vermont Oxford data, QI data, Critical Incident)
- ___ Literature (e.g. EPIC/PHSI site, Conference, Article, Guidelines, Journal Club, Rounds).
- ___ Individual (e.g. EPIC/PHSI member, senior person indicated need, told to do it, felt correct).
- ___ Equipment (e.g. product changes, new equipment).
- ___ Other _____

3. Domain that is being targeted by this Practice Change (select one or more):

- Nosocomial infection
- Bronchopulmonary dysplasia
- Brain injury
- Nutrition/NEC
- Sensory (ROP/Hearing)
- Patient care/safety
- Other _____

	WHAT?	WHO?	WHEN?
AIM	What practice(s) do you want to change? (e.g. give surfactant within 30 min, new IV start policy, weekly review of "routine" blood work)	Who is taking ownership of this?	When was it decided to do this?
PLAN	What needs to be in place to do this?	Who needs to be engaged?	When will you start?
DO	What are you actually doing at the bedside in the institution?	Who is responsible to make this happen?	When did you actually start?
STUDY	What outcome are you measuring? How are you measuring it?	Who evaluates the outcomes?	When will you complete the evaluation?
ACT	What did your results tell you to do next? If ACT is still in progress please provide details below.	Who needs to know (groups)?	When will you implement your findings?

4. Do you have any tips for implementing this PDSA?

5. Can we share this Practice-Change form with other sites by:

The logo consists of the letters 'EPIQ' in a blue, sans-serif font. A red circular icon with a white symbol inside is positioned to the right of the letter 'Q'.

EPIQ

A large graphic featuring a red arrow pointing left, overlaid on a blue background with a white horizontal bar. The text 'EPIQ Study' is written in white on the blue background.

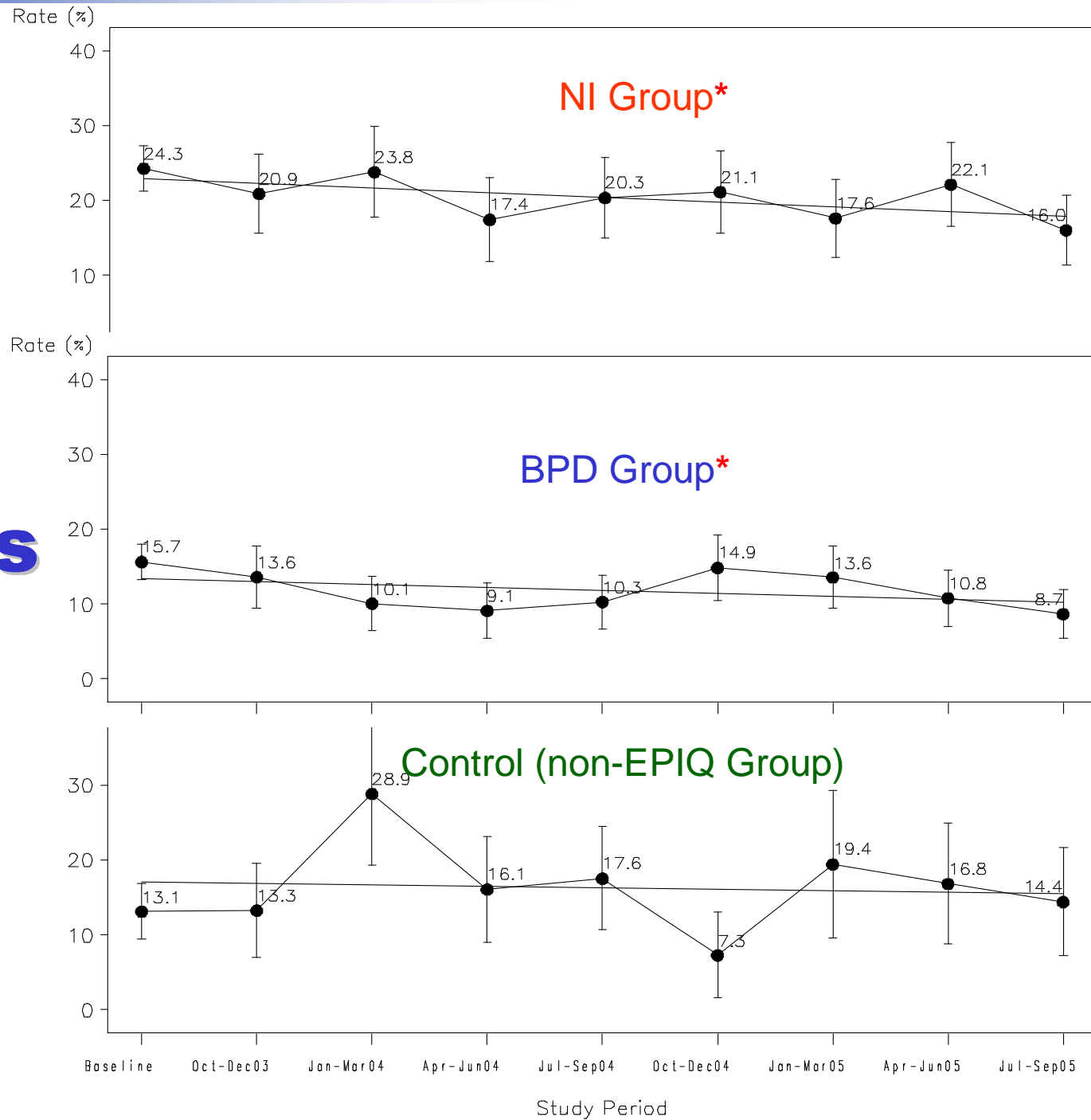
EPIQ Study

- Prospective cluster randomized controlled trial 12 Canadian NICUs
- Randomized into 2 groups:
 - Bronchopulmonary Dysplasia (BPD), and
 - Nosocomial Infection (NI)
- Each group Control for other
- Additional controls - 5 other NICUs in CNN not participating in the study

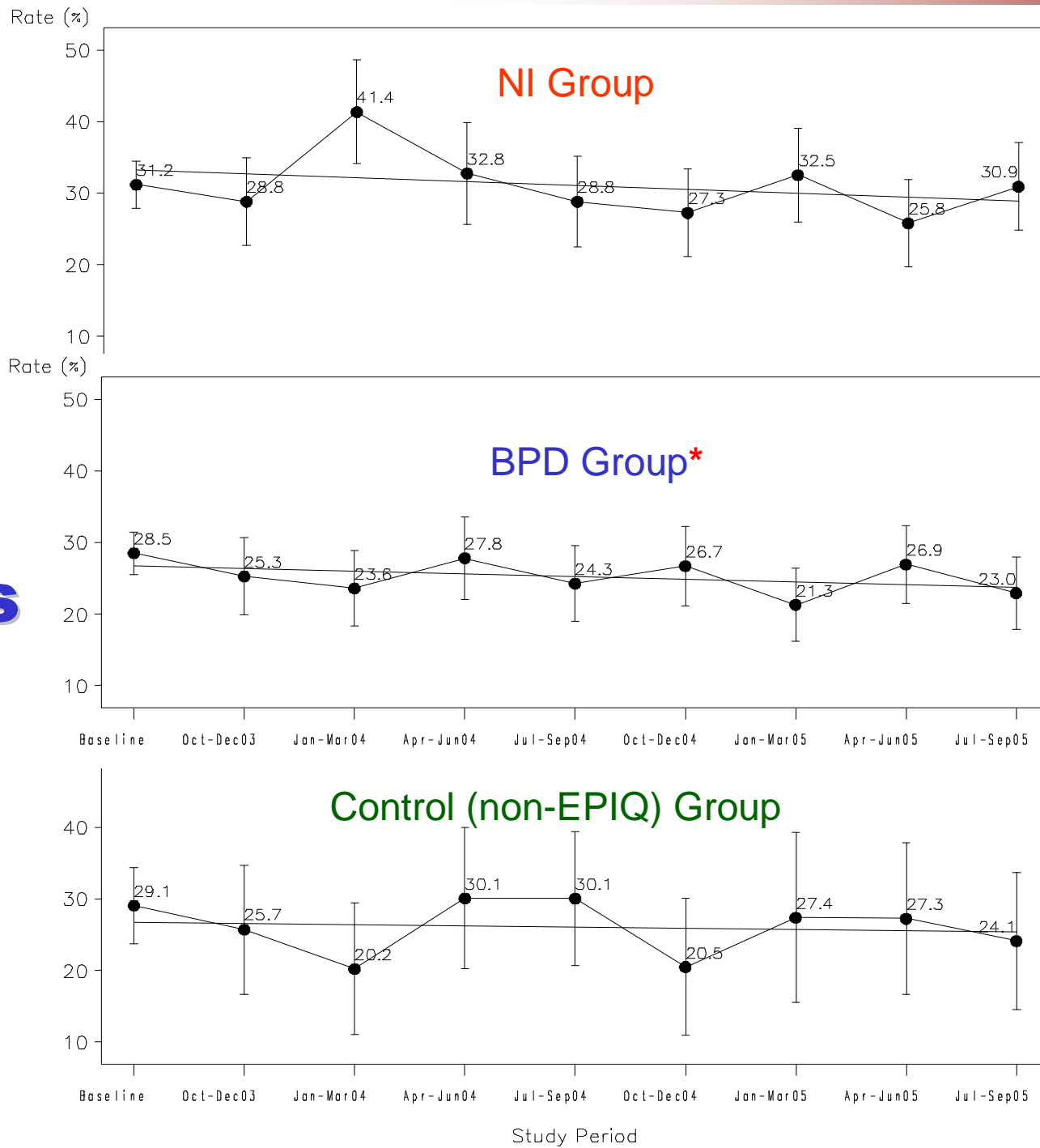
Characteristics	NI	BPD	Control
Number	2336	2316	1129
Mean Gestation (wk)	28.5	28.9	28.9
Mean Birthweight (gm)	1246	1315	1150
Outborn (%)	37.5	18.0	14.9
Cesarean section (%)	54.1	55.5	58.8
Apgar ≤ 7 at 5 min (%)	20.3	19.1	44.0
Antenatal steroids (%)	71.1	70.7	90.5

- Change not executed well
- Support processes inadequate
- Hypothesis/hunch wrong
- Change executed but did not result in local improvement
- Local improvement did not impact global measure

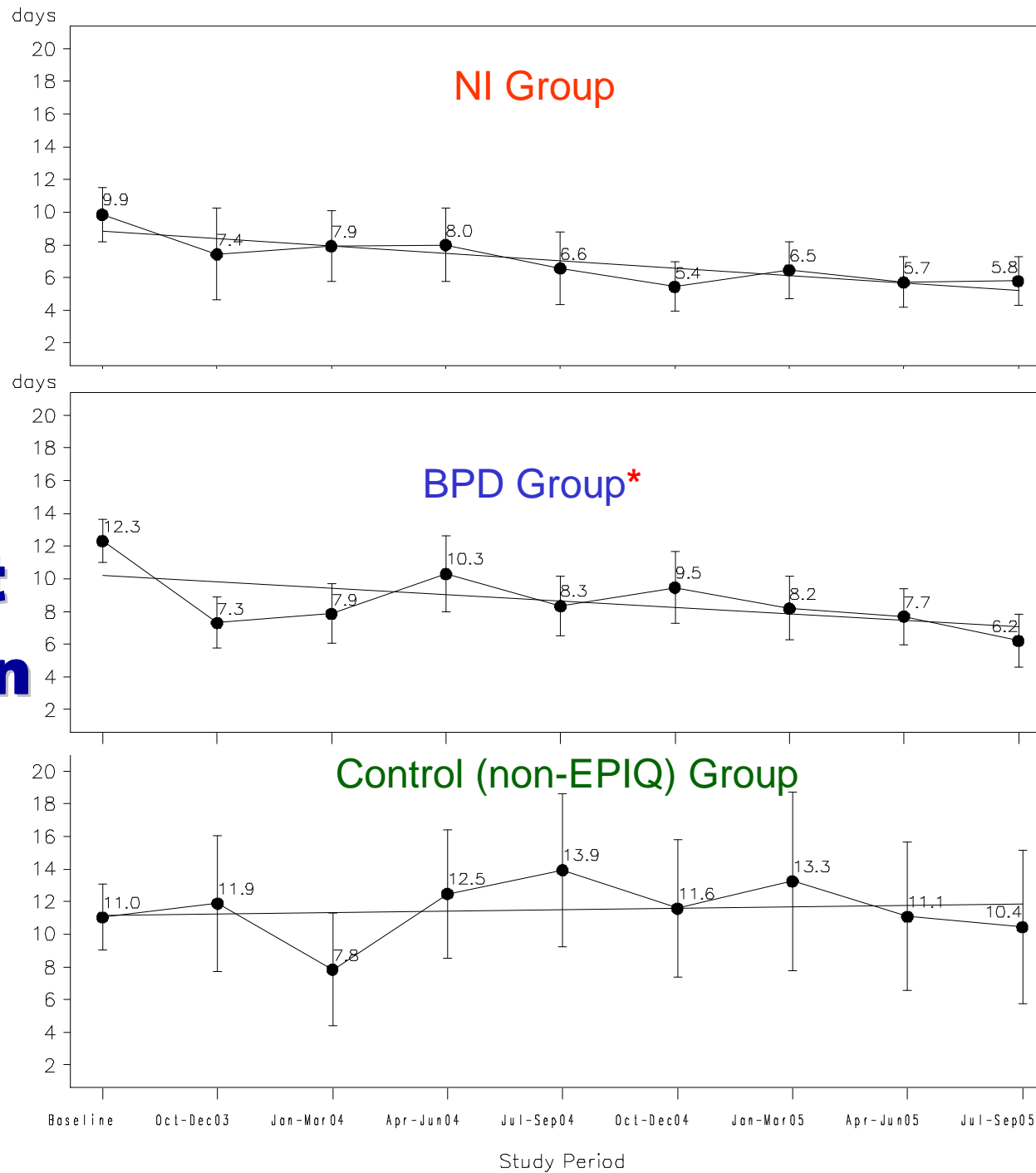
NI Rates



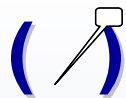
BPD Rates



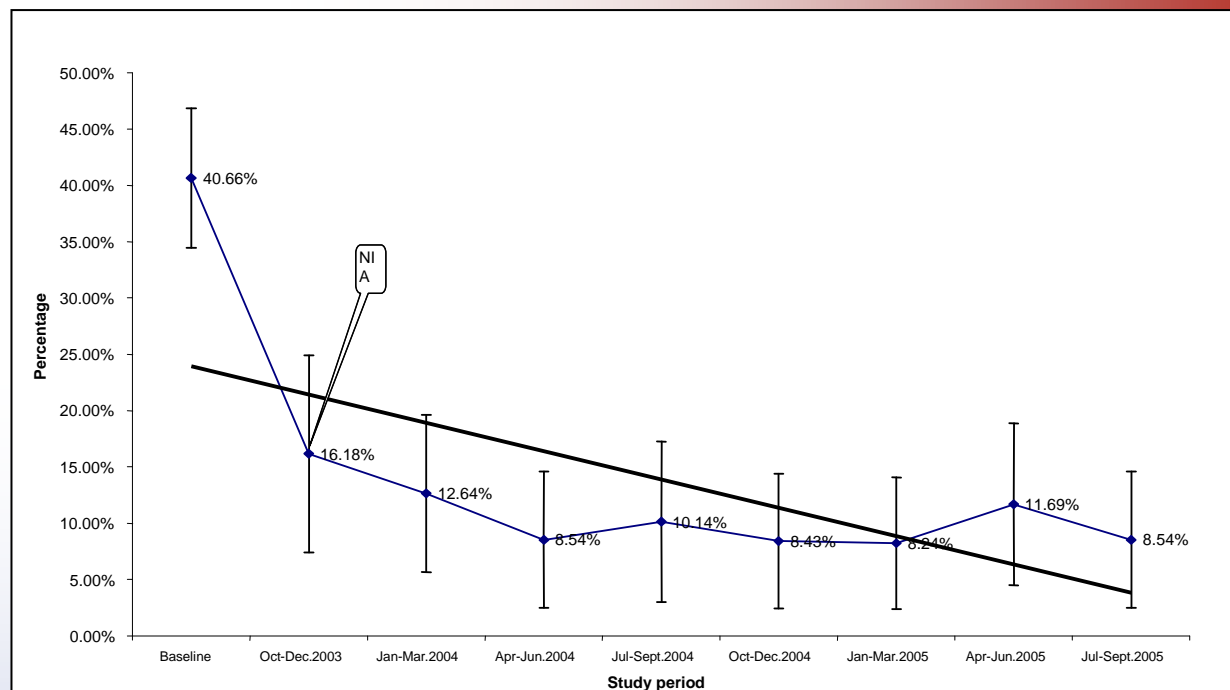
O₂ Support Duration



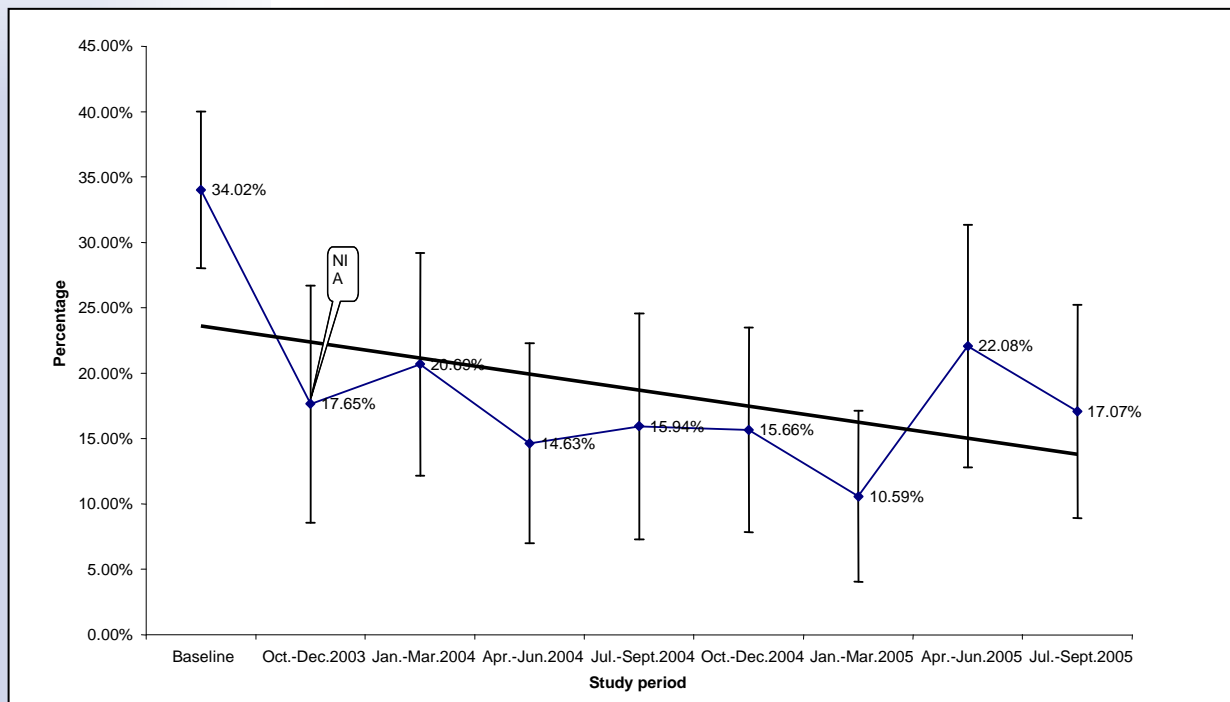
NI Practice Change: avoid Vancomycin

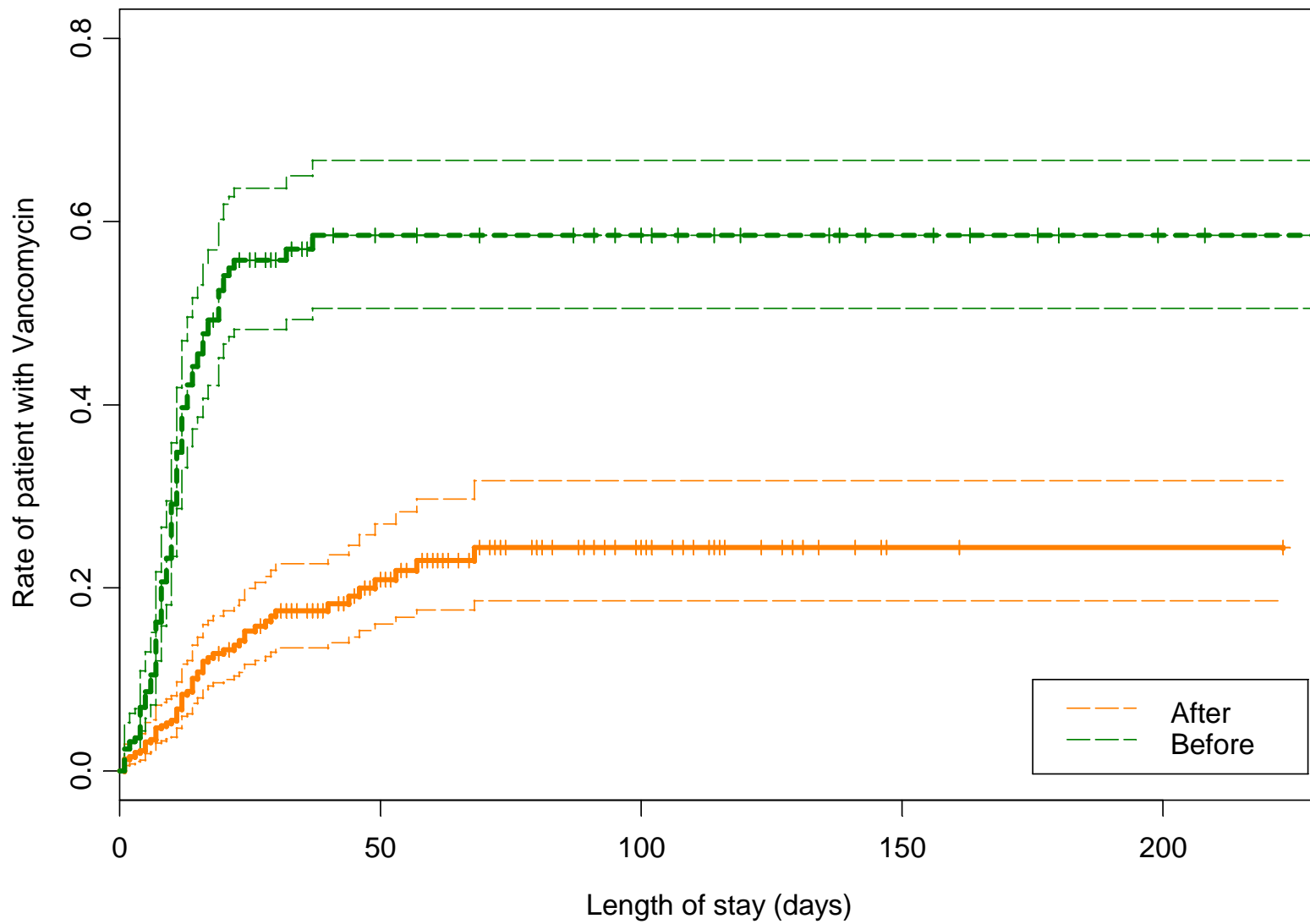


Use of Vancomycin

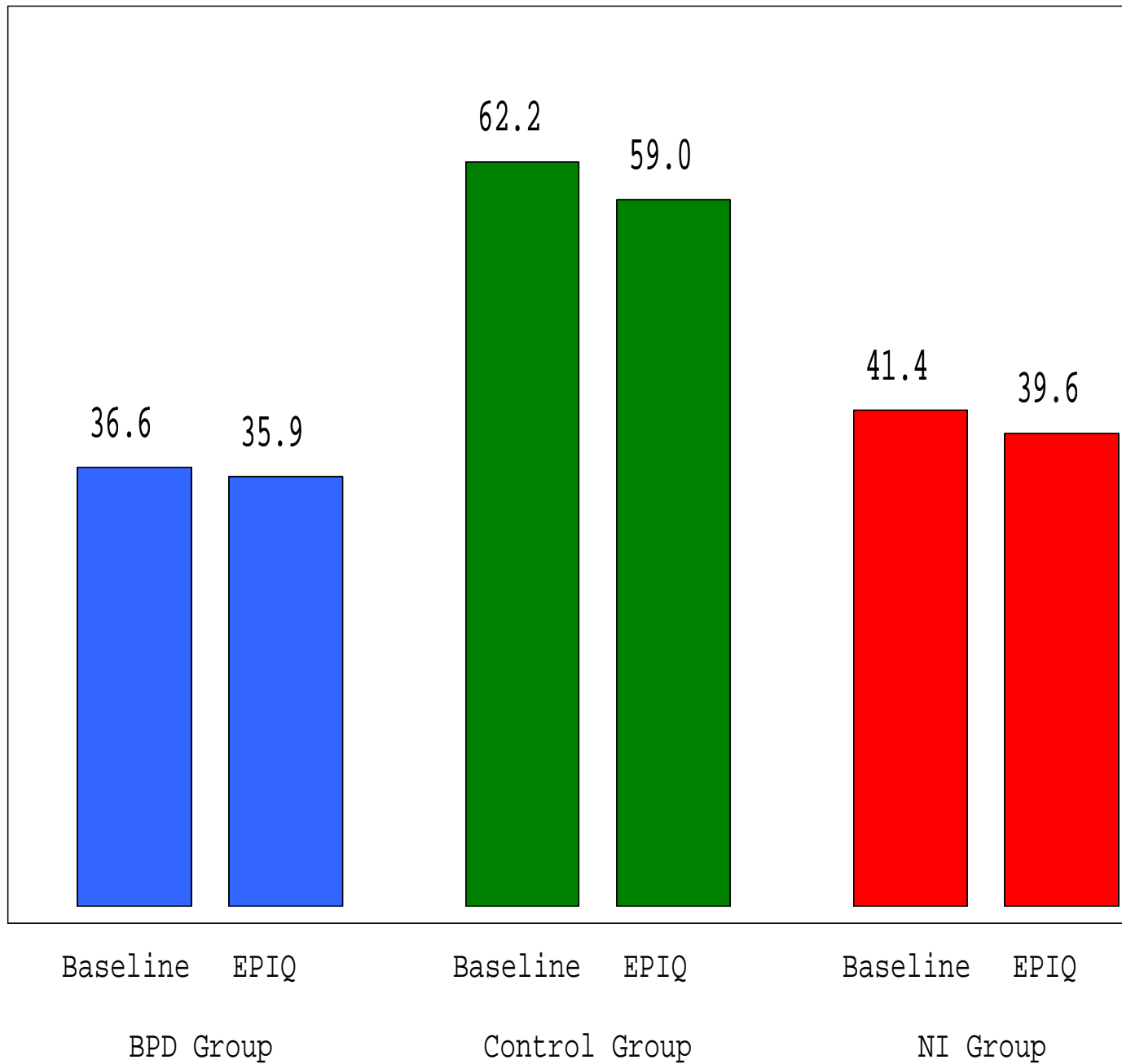


NI Rate

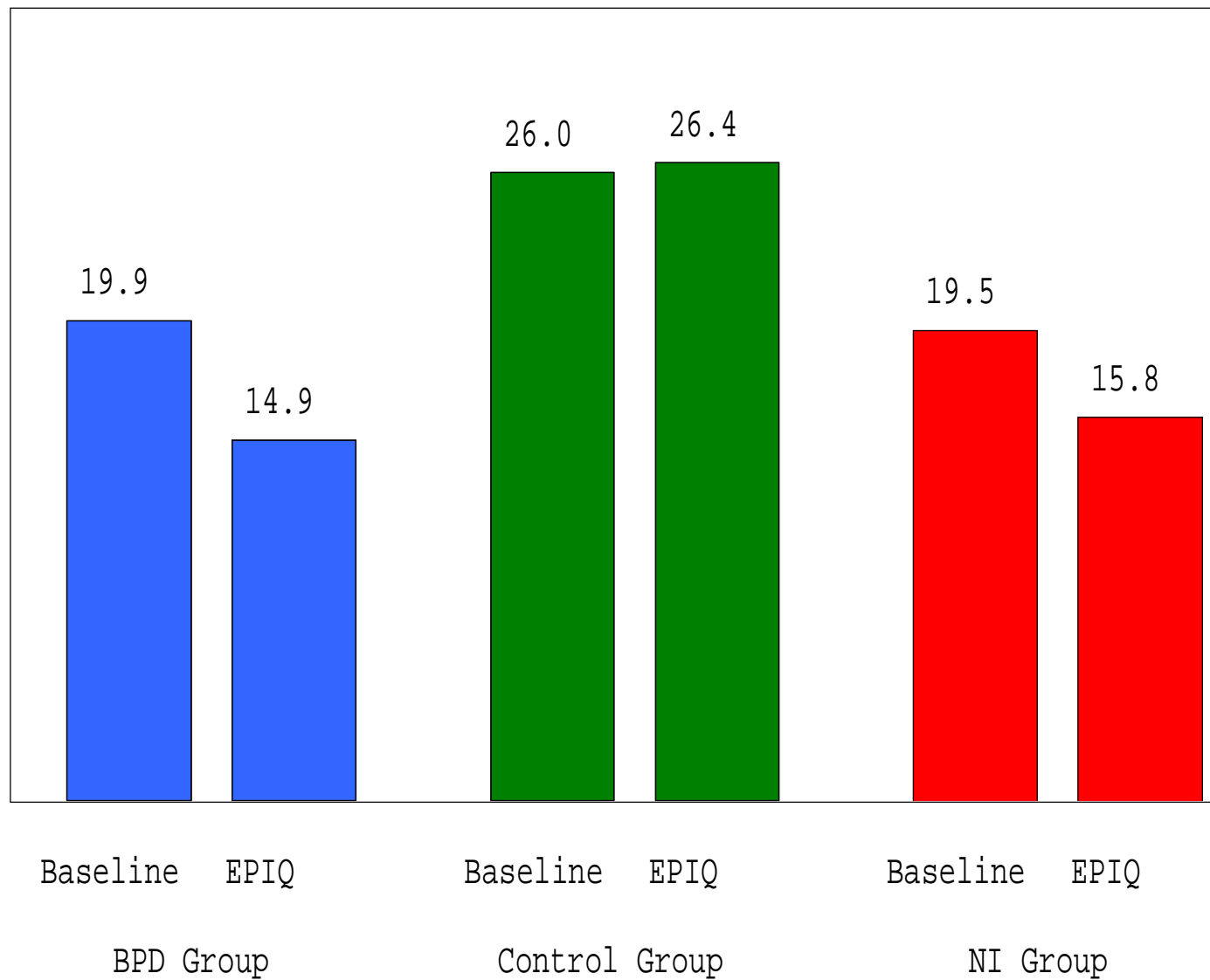




Average Length of Stay (days)



Average
Duration
of O₂
(days)



EPIQ

Economic Impact



1. Length of Stay (LOS)

e.g. for NI Group babies <32 w LOS After vs
Before EPIQ = $39.6 - 41.4 = -1.8$ days

For our study alone this represents potential
savings of $-1.8dx$ 6519 patients/3yr in study =
3,911 patient days /yr @ \$1350/d*
=\$5,280,390/y!

*in 2004 BC dollars; SK Lee and L Andersen. 2004. BC Perinatal Services Costing
Project: report on costs in the neonatal intensive care unit. 38 p.

Not statistically significant at $p=0.05$

2. Duration of Oxygen

e.g. for BPD Group babies <32 w # days on O₂ After vs Before EPIQ = 14.9 - 19.9 = -5 days

For our study alone this represents potential savings of -5d x 6519 patients/3y in study = 10,865 O₂ days /yr @ \$12/d *

=\$130,380/y !

Not including increasing patient comfort and safety, and reducing staff burden.

*estimated from home care oxygen costs in 2007.

Statistically significant at p=0.05



Conclusions

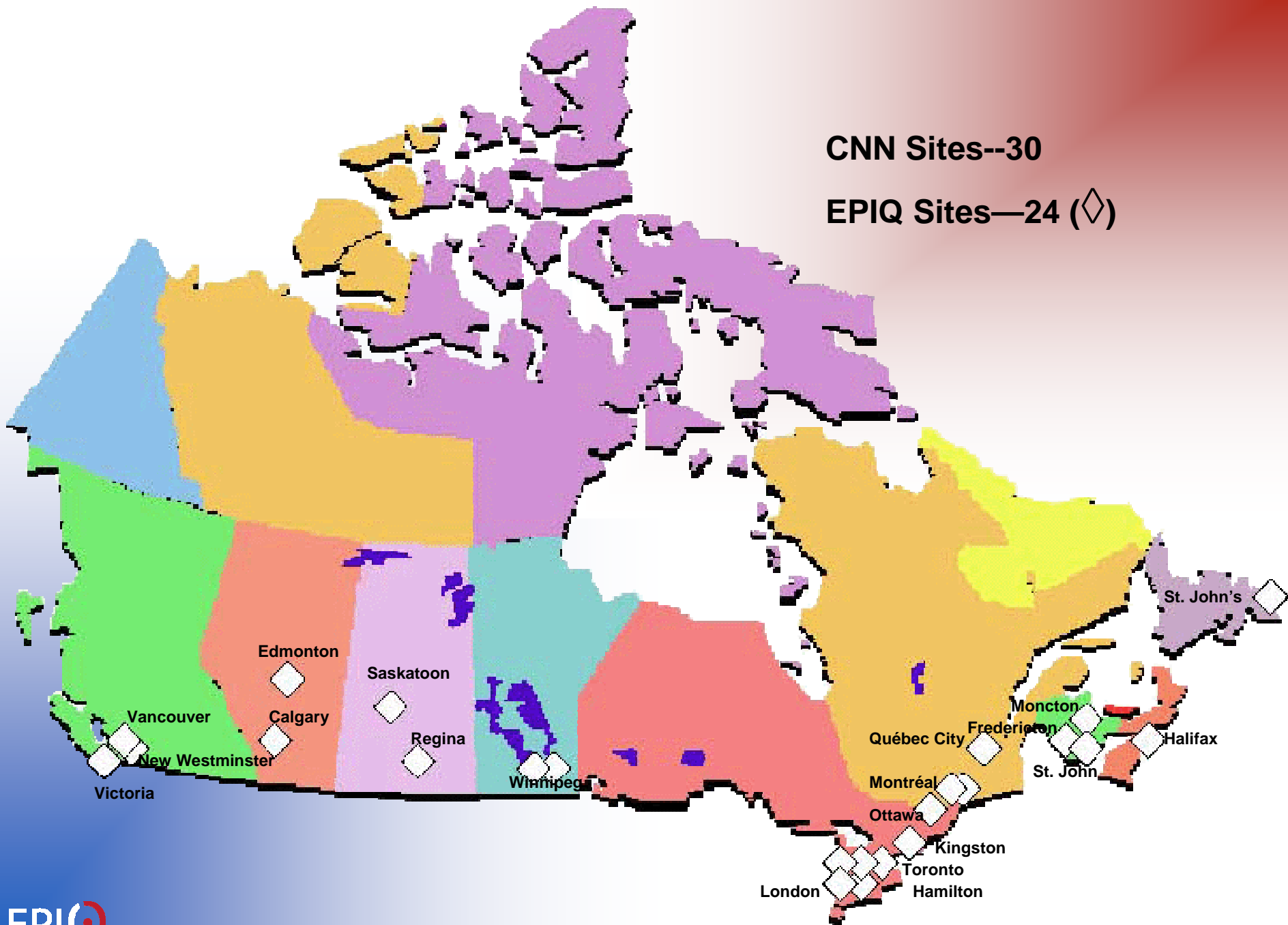
- EPIQ is effective in the NICU
- EPIQ has significant economic impact on outcomes and cost of care
- Direct cost savings to healthcare does not consider cost to family and society
- Such efforts should be supported

The logo for EPIQ, featuring the letters 'EPIQ' in a white, sans-serif font. The letter 'Q' is stylized with a red dot and a red line that curves around the bottom right of the letter, resembling a location pin or a stylized 'Q'.A large, horizontal red arrow pointing to the left, positioned at the top of the slide. The arrow has a gradient from dark red on the left to a lighter red on the right. The background of the slide is a gradient from blue on the left to white on the right.

FUTURE

CNN Sites--30

EPIQ Sites—24 (◇)



Sites with Limited/No Involvement

In CNN

- Cape Breton Regional Hospital (need data abstractor)
- Centre Hospitalier Universitaire de Sherbrooke
- Children's Hospital of Eastern Ottawa (need data abstractor)
- Hôpital Maisonneuve-Rosemont, Montréal
- Québec hospitals (missing info for babies >1500g)
- Royal Alexandra Hospital, Edmonton (need data abstractor)

In EPIQ

- CNN list (above) plus,
- Jewish General Hospital, Montréal
- Montréal Children's Hospital
- Regina General Hospital, Regina (limited involvement)
- Royal Columbia Hospital, New Westminster (limited involvement)

THANK YOU



iCARE *about health*
Integrated Centre
for Care Advancement
through Research


Michael Smith Foundation for
Health Research


CIHR IRSC
Canadian Institutes of Health Research
Institut de recherche en santé du Canada



EPIQ