Long-term Improvement of Ventilator-Associated Pneumonia in Bumrungrad International 2001-2007.

Junya Jarayopas

Department Manager, Infection Control


Bumrungrad
International

BI Clinic (Building A)

Ward (Building B)

Infection control Department

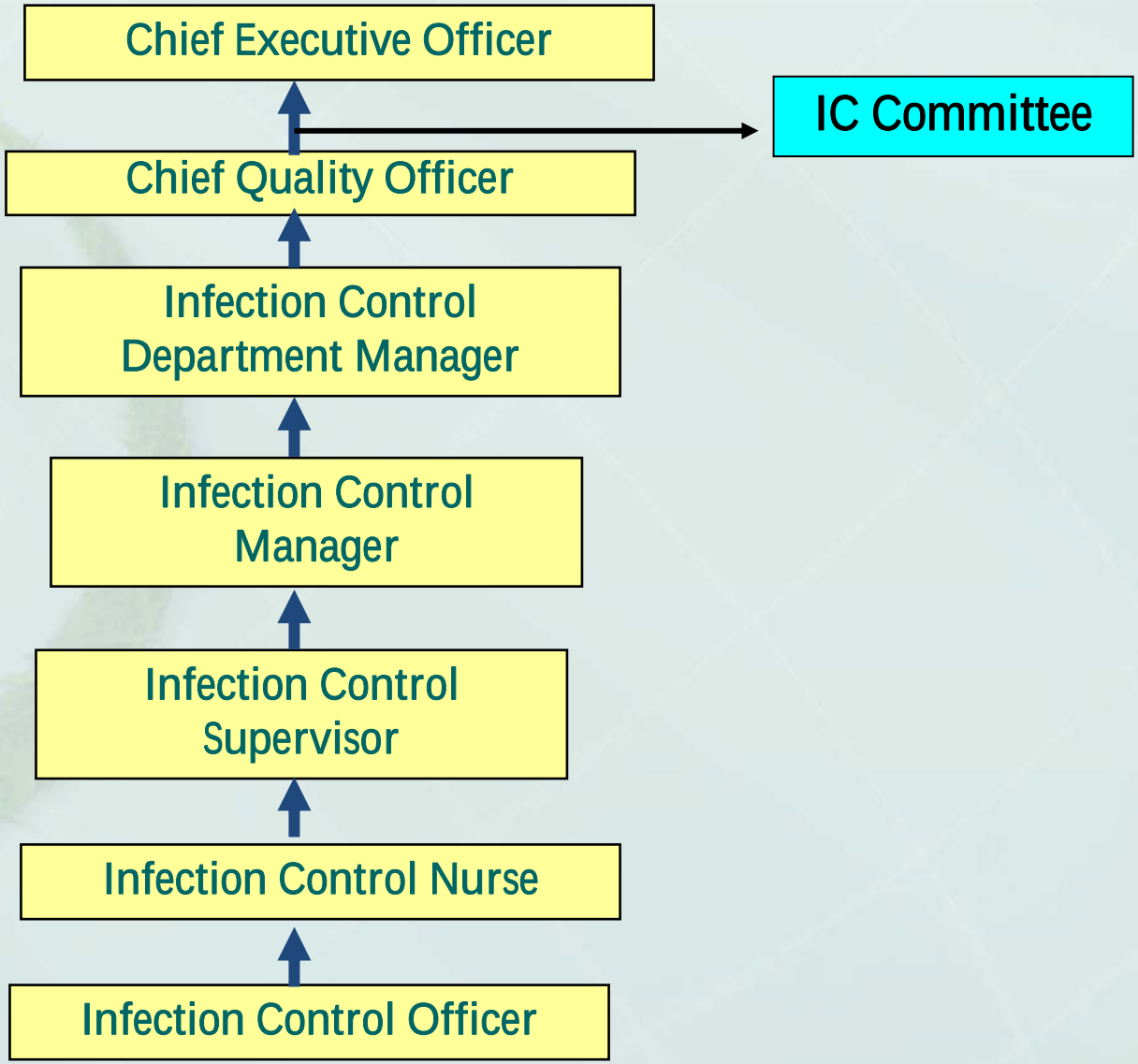
Vision : World Class IC program

Mission : We provide world class IC program for your safest

Aim : Reduce Hospital acquired-infection rate to reach or below 50 percentile of NNIS.

Objective : Reduce overall Hospital acquired-infection rate 15% less from 2007.

Line of Organization



Coordinating mechanism

1. Participate in Committee and Department meetings
   - Management team , Nursing Management ,
   - ICC & ICWN Meeting
   - OR, Med, Surgery, Pediatric,OB, Special and Dental Department Meeting
2. Small group discussion with ICWN and Ward meeting
3. IC Consultation available 24 hrs a day
4. Patient safety walk round
5. Internal audit
6. CQI project
   - IC : S.W.A.T. (S.W.A.T. = Special Watching Awareness Team)
   - Interdepartmental : CQI mold ,CQI room maintenance
7. IC Audit : Food service
8. Outsource (Drinking water , Laundry) site visit pre enrollment and every 2 yr.

IC Team :

1 ID : Chairman of IC committee

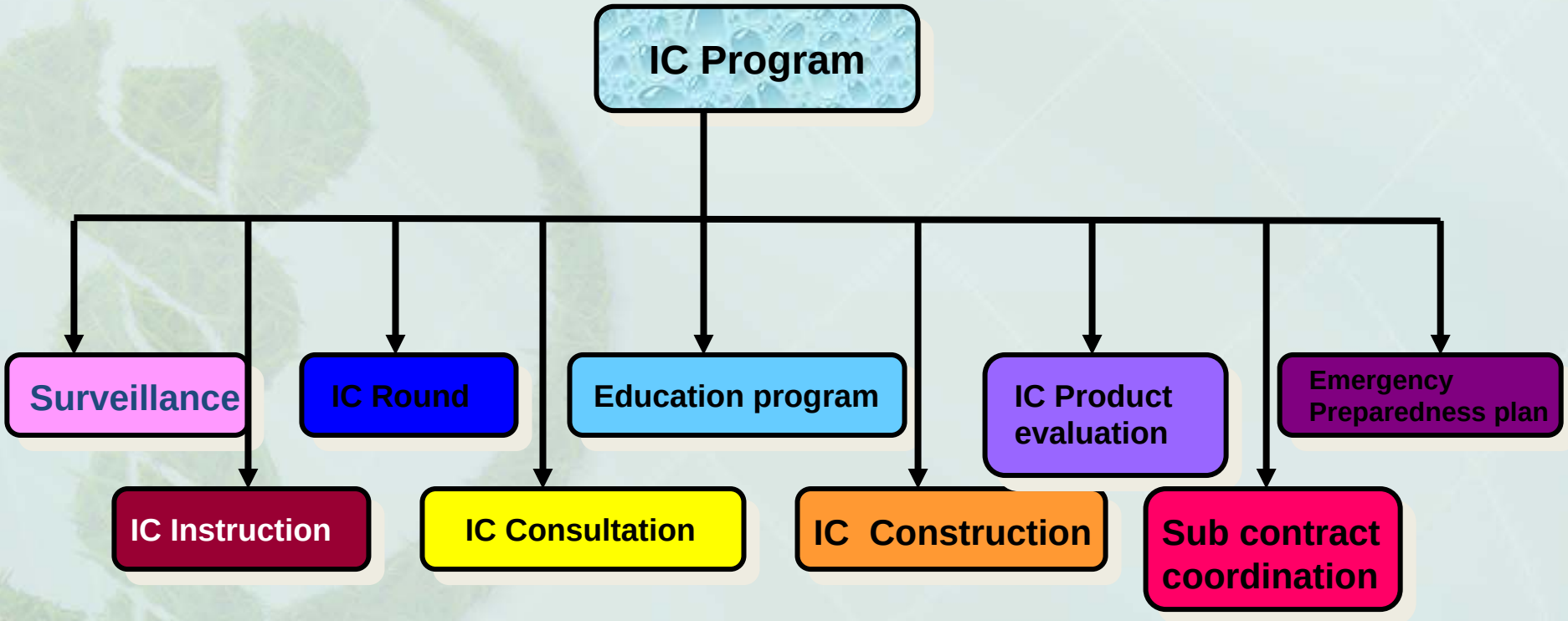
7ICNs : 1 DMG : Master degree

: 1 MGR and Supervisor : RN with ICN specialist course.

: 2 ICNs : RN with ICN specialist course.

35 ICWNs : RN representative from each department.

1 IC officer : IT and Secretary.


IC Program
Surveillance
IC Round
Education program
IC Product evaluation
Emergency Preparedness plan
IC Instruction
IC Consultation
IC Construction
Sub contract coordination

Infection Control Department

Microbiology sur.

IC Round

IC Construction

Surveillance

On the job injury ,

cable diseases

Secretary

ว่างงาน

IC performance indicator

Surveillance

Healthcare Associated Infection (HAI)

* Incident density
  * VAP
  * CAUTI
  * CRBSI
  * Procedure specific SSI rate
* DU (Device Utilization ratio)
* Point prevalence

Focus surveillance

* SSI
* MDROs

Environment

* Waste water
* Drinking water
* RO water (HD)
* Sort water for Autoclave

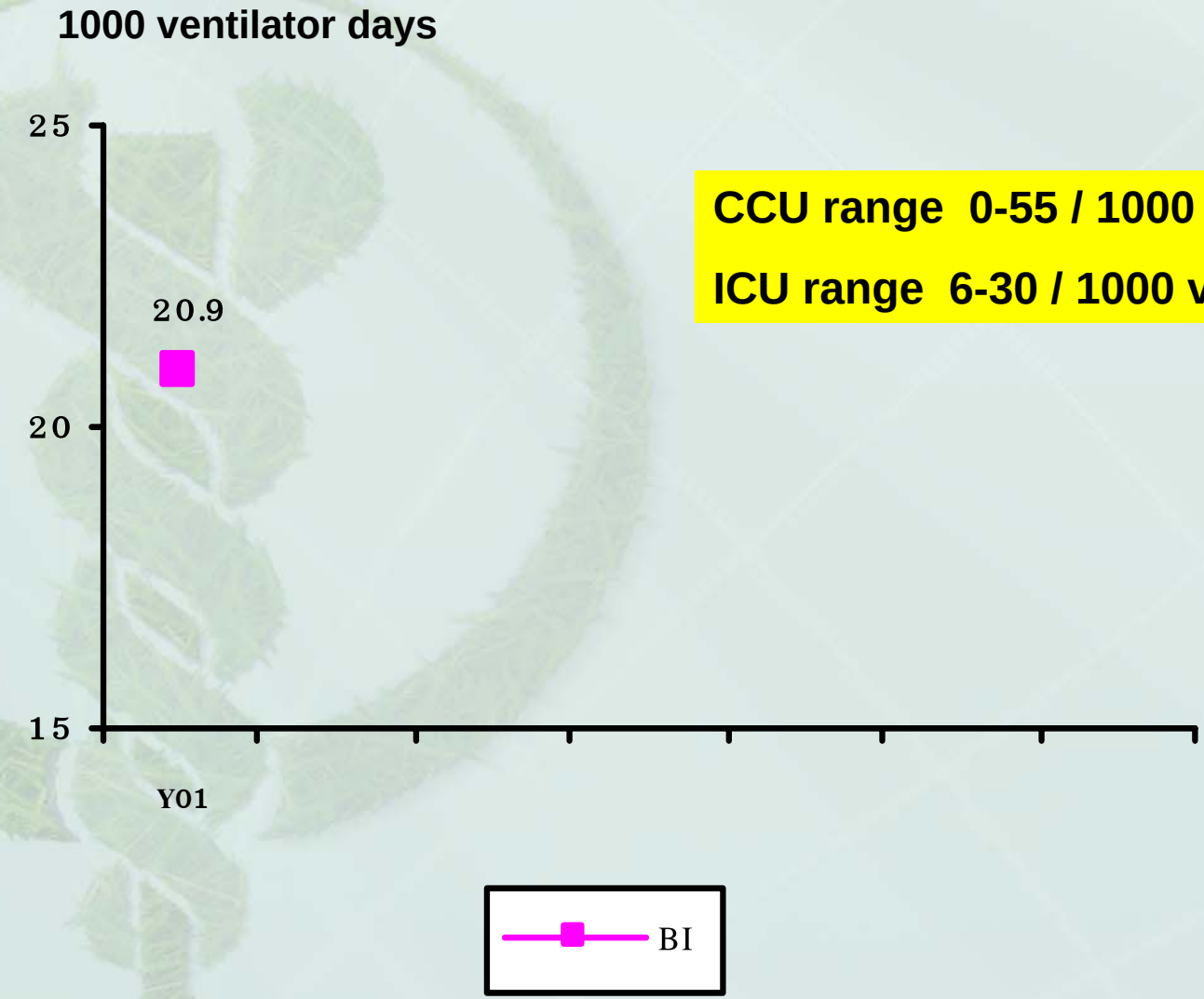
Communicable Disease

* Endemic
  - TB
  - DHF
  - HFM
* Epidemic
  - SARS
  - Avian flu

Surveillance HAI

- Active surveillance with patient & Laboratory base system
- Pro active MDROs surveillance
- Target surveillance with International infection rate
  - Incident density
  - Device association infection rate
  - Procedure Specific - SSI Rate
- Report by overall and by department
- Point Prevalence twice / year

Ventilator associated Pneumonia (VAP)



CCU range 0-55 / 1000 ventilator days

ICU range 6-30 / 1000 ventilator days

VAP

- Early Onset- within 48-72 of intubation.
  - aspiration complicating intubation
  - MSSA, H. Flu, Strep. Pn.
- Late onset- >72 hrs after intubation.
  - MRSA, Pseudo A, acinetobacter, enterobacter sp.

Kollef NEJM 1999

VAP-Pathogenesis

- 2 Processes required:
  - bacterial colonization aerodigestive tract
  - aspiration of contaminated secretions into the lower airway
- Invasive Medical devices contributor
  - NG tubes→ gastric reflux, aspiration
  - ETT→ facilitate bact. colonization trach/ bronch tree and aspiration via mucosal injury, pooling of secretions above cuff, elimination of cough reflex.
  - ventilator circuit, resp. therapy equipment.

Kollef NEJM 1999

Ventilator associated Pneumonia (VAP)

1000 ventilator days

25

20

15

Y01

Early / Late onset VAP

CQI :2 suction tubes
: oral care q 4 hrs

Review :- VAP Pathogenesis

:- BI practice

Suction : ET → nose → mouth

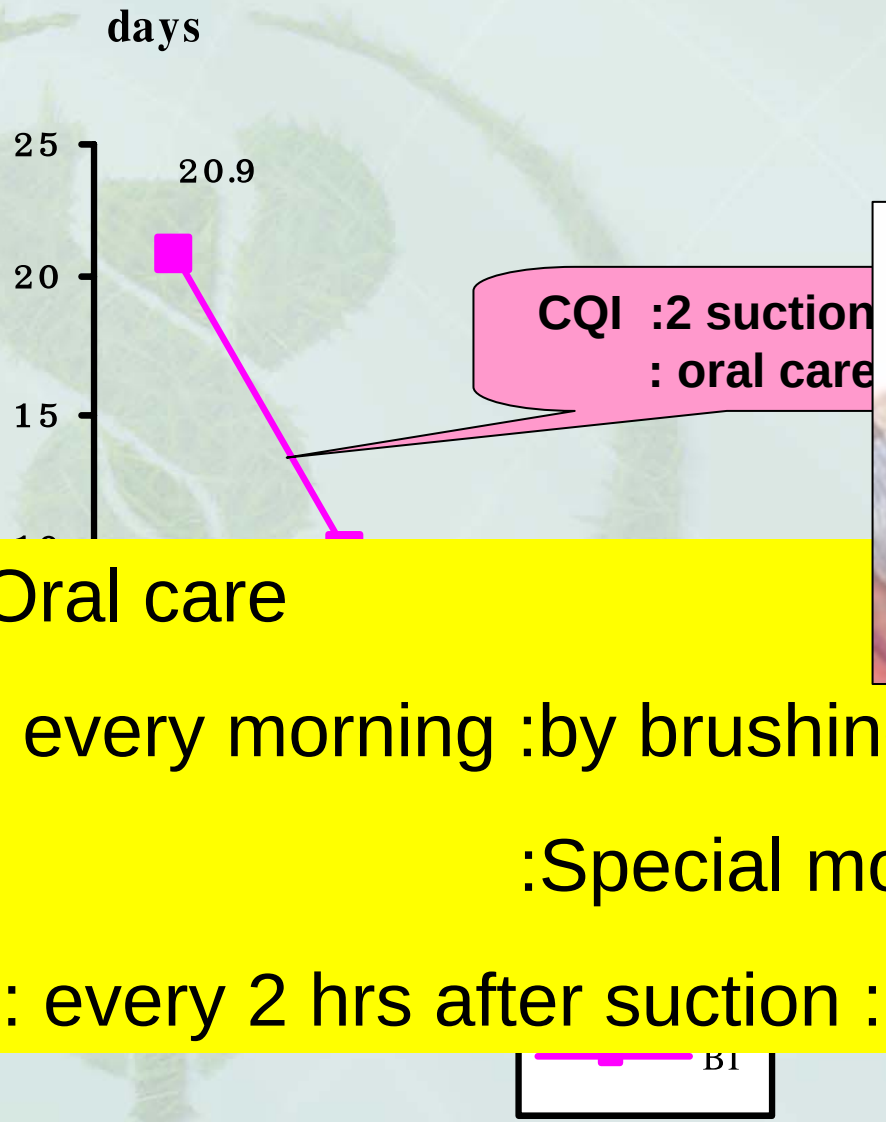
Oropharyngeal secretions that accumulate above the tube cuff to leak into the lungs.

BI

Key Functions/Performance Measures	Threshold/ Benchmark	Compliance Rate (%)										
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	No
I.Safety RTI	100%	96%	99%	100%	100%		100%	100%	100%	100%		
1. มีการให้คำแนะนำกับผู้ป่วย และญาติก่อนการปฏิบัติ	100%	100	100	100	100		100	100	100	100		
2. มีการเตรียมอุปกรณ์อย่างถูกต้องและครบถ้วน	100%	100	88.3	100	100		100	100	100	100		
3. มีการใช้หลัก Aseptic technique ในการ	100%	100	100	100	100		100	100	100	100		
Suction ใน ET/TT อีก												
4. ดูดเสมหะในจมูก/ปาก แล้วใช้สาย suction	100%	85	100	100	100		100	100	100	100		
ชุดใหม่ดูดใน ET/TT												
5. มีการล้างสาย Suction ที่มีเสมหะติดค้างด้วย	100%	100	100	100	100		100	100	100	100		
Sterile water + มีการเปลี่ยนขวด Sterile waterทุก24ชม												
6. ผู้ช่วย suction สวมถุงมือและใช้ alcohol เช็ด ambu	100%	95	100	100	100		100	100	100	100		
7. มีการเปลี่ยนขวด Suction ใหม่เมื่อเต็มหรือเมื่อครบ3วัน	100%	100	100	100	100		100	100	100	100		
8. มีการเปลี่ยน Circuit Ventilator q 2 Day และ	100%	100	100	100	100		100	100	100	100		
daptor joint ทุกวัน												
9. TT care q 4 โดยใช้ Aseptic tecnique	100%	87.5	100	100	100		100	100	100	100		

Ventilator associated Pneumonia (VAP)

1000 ventilator



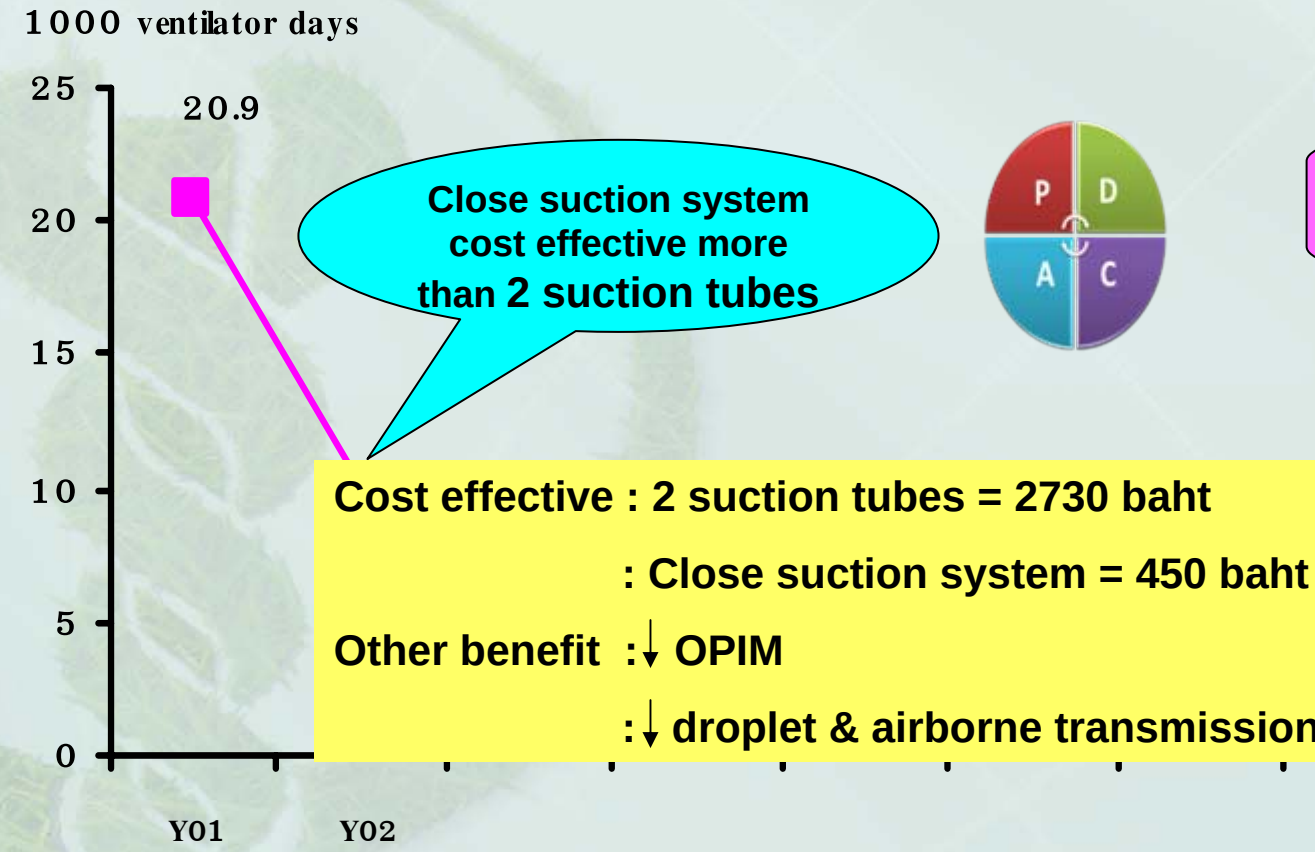
Oral care

: every morning :by brushing teeth.

:Special mouth wash.

: every 2 hrs after suction : Drinking water.

Ventilator associated Pneumonia (VAP)



Close suction system cost effective more than 2 suction tubes

Provide Close suction system

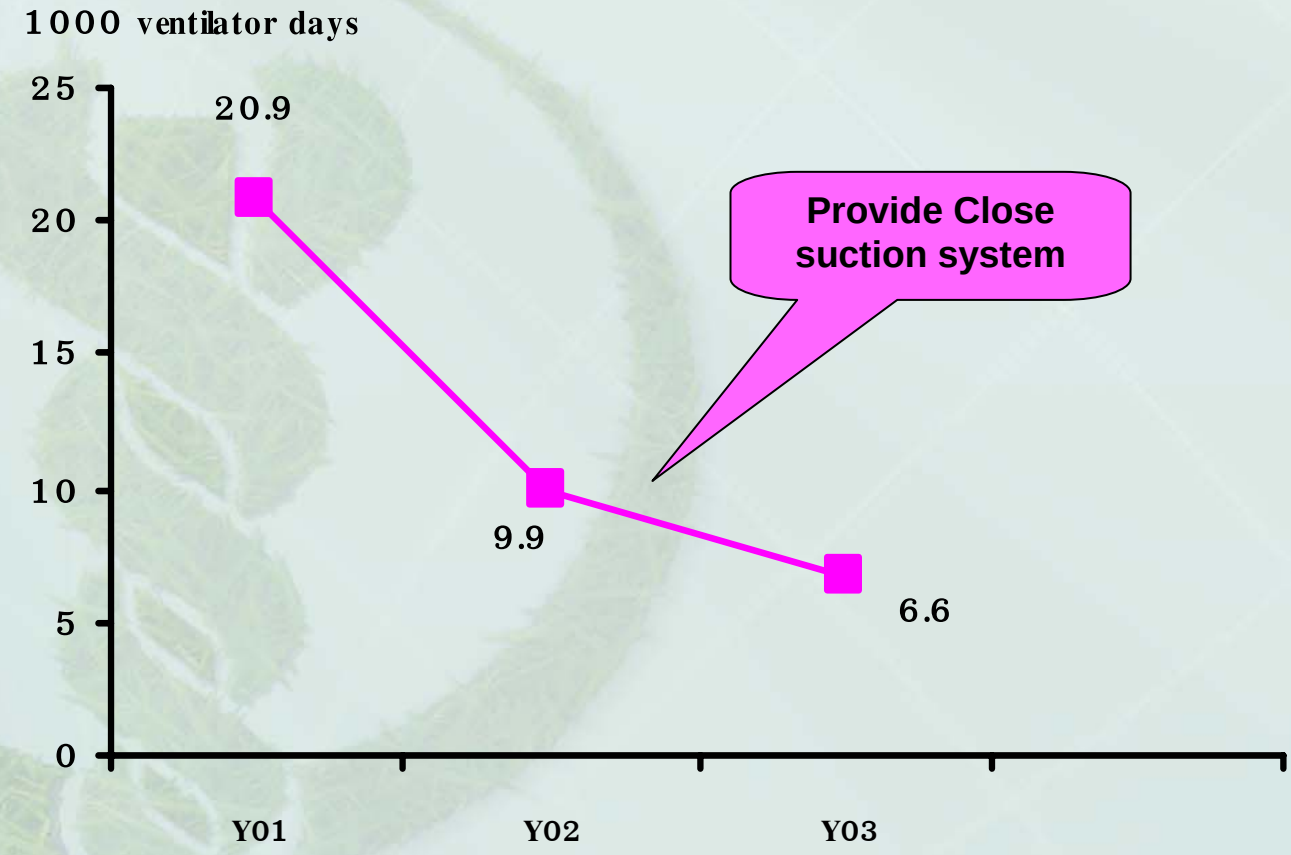
Cost effective : 2 suction tubes = 2730 baht

: Close suction system = 450 baht

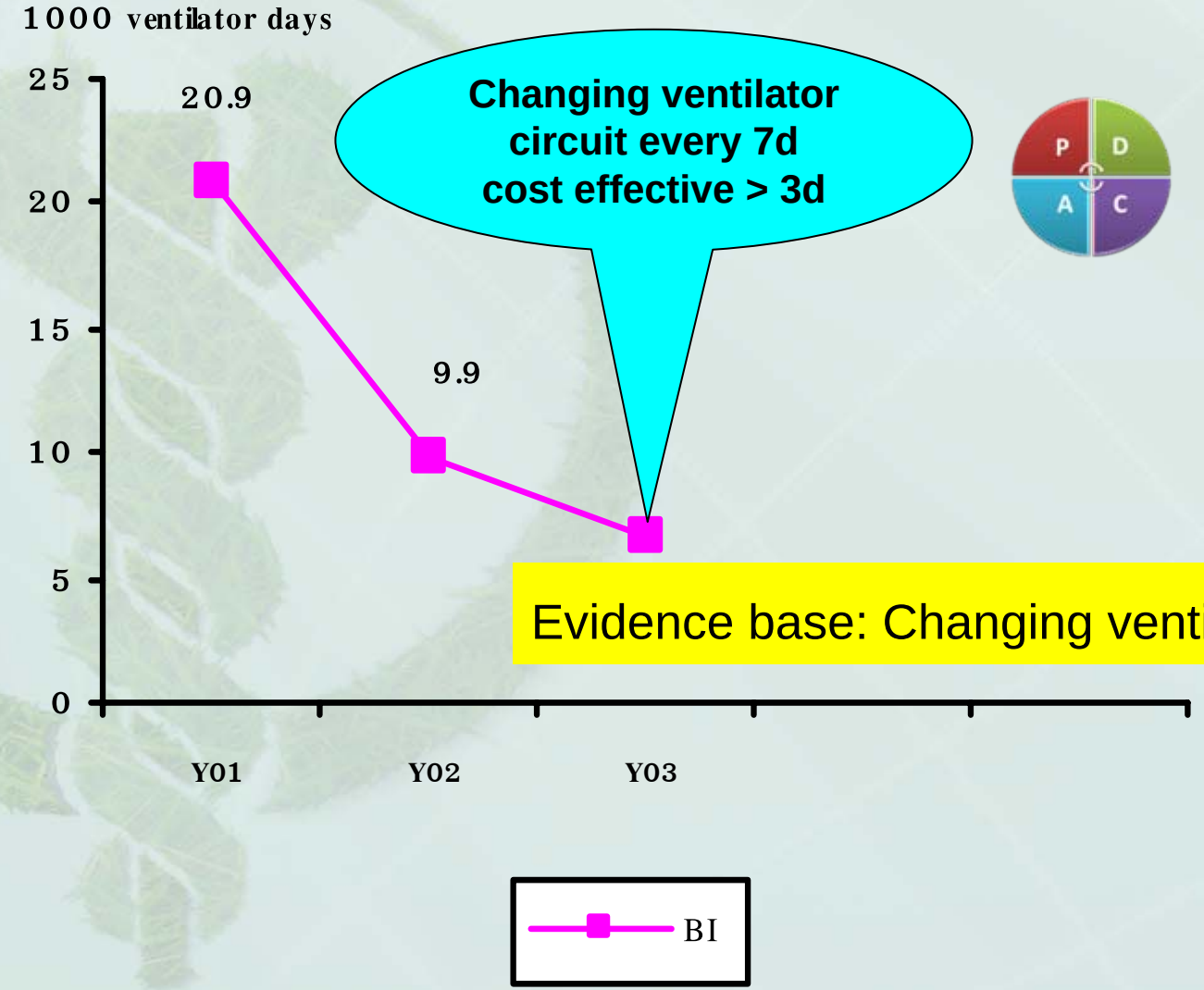
Other benefit : ↓ OPIM

: ↓ droplet & airborne transmissions

Ventilator associated Pneumonia (VAP)



Ventilator associated Pneumonia (VAP)

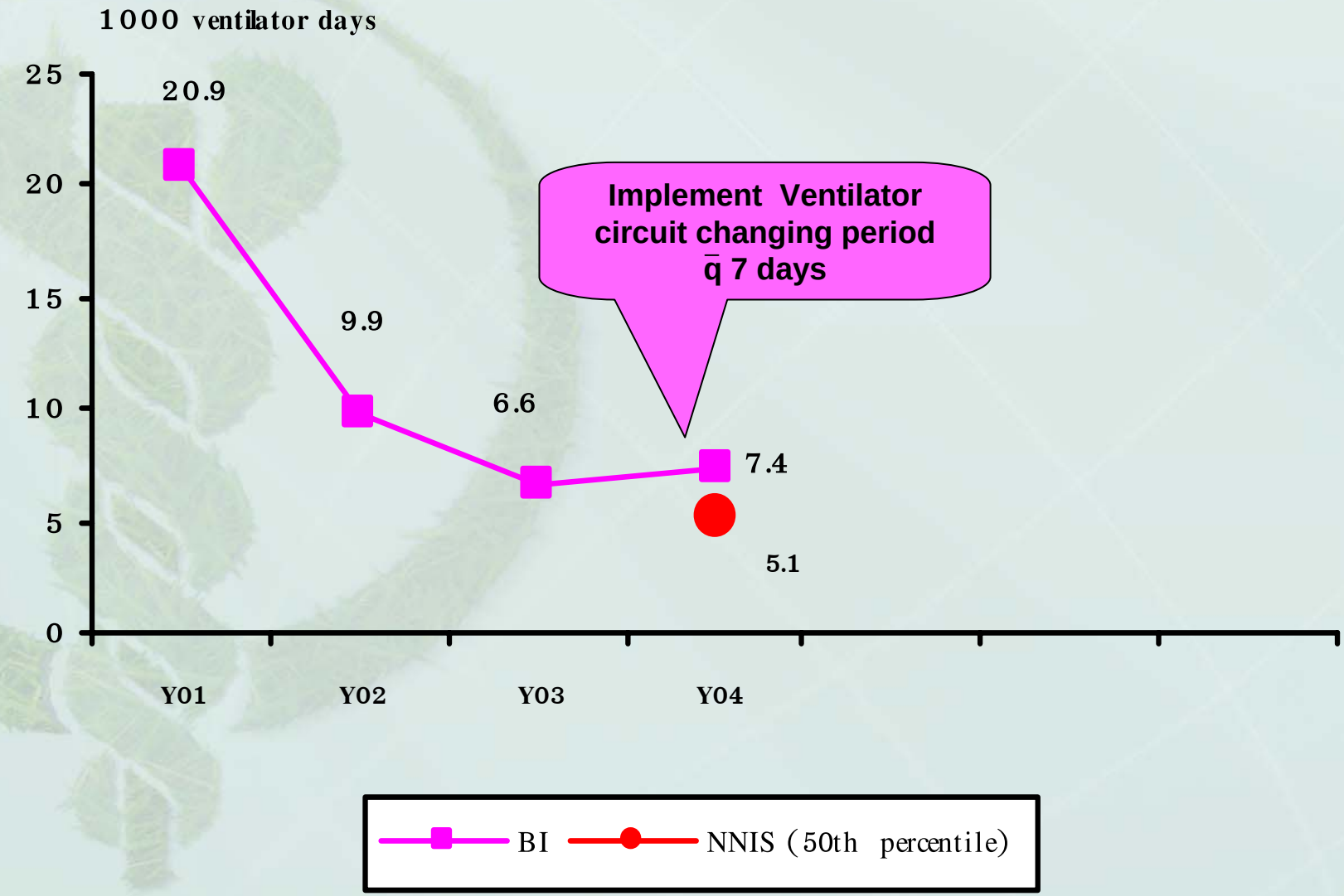


Changing ventilator circuit every 7d cost effective > 3d

Implement Ventilator circuit changing period q 7 days

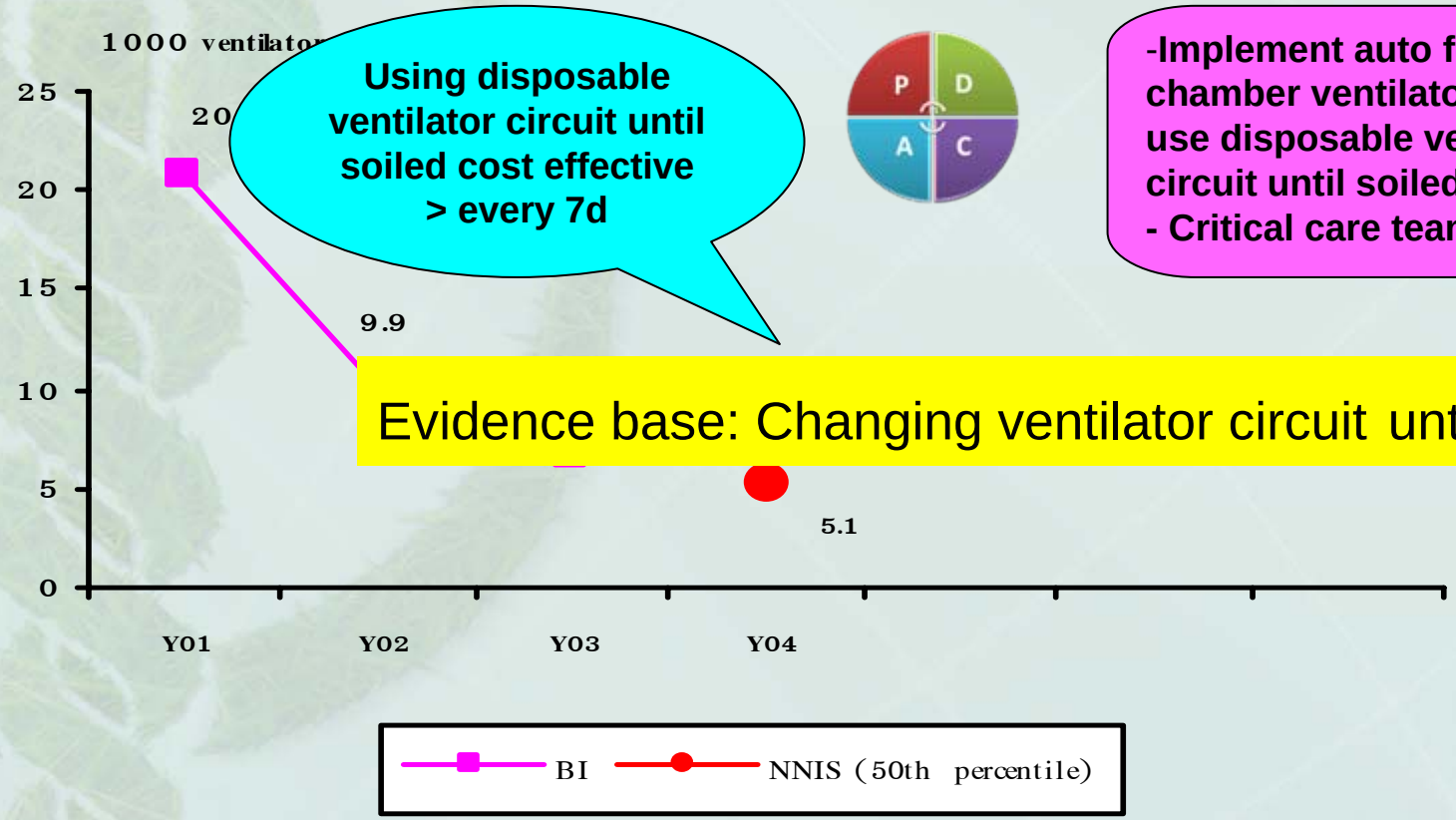
Evidence base: Changing ventilator circuit until soil

Ventilator associated Pneumonia (VAP)



Organism	Y04 Organism = 52
Pseudomonas aeruginosa *MDR*	32.69% (17) 11.76% (2)
Stenotrophomonas maltophilia *MDR*	17.30% (9)
Acinetobacter calco baumanii	9.61% (5)
Ventilator day average	17
Range	2->4 months
Risk factor	Immuno-suppression+Aspiration

Ventilator associated Pneumonia (VAP)

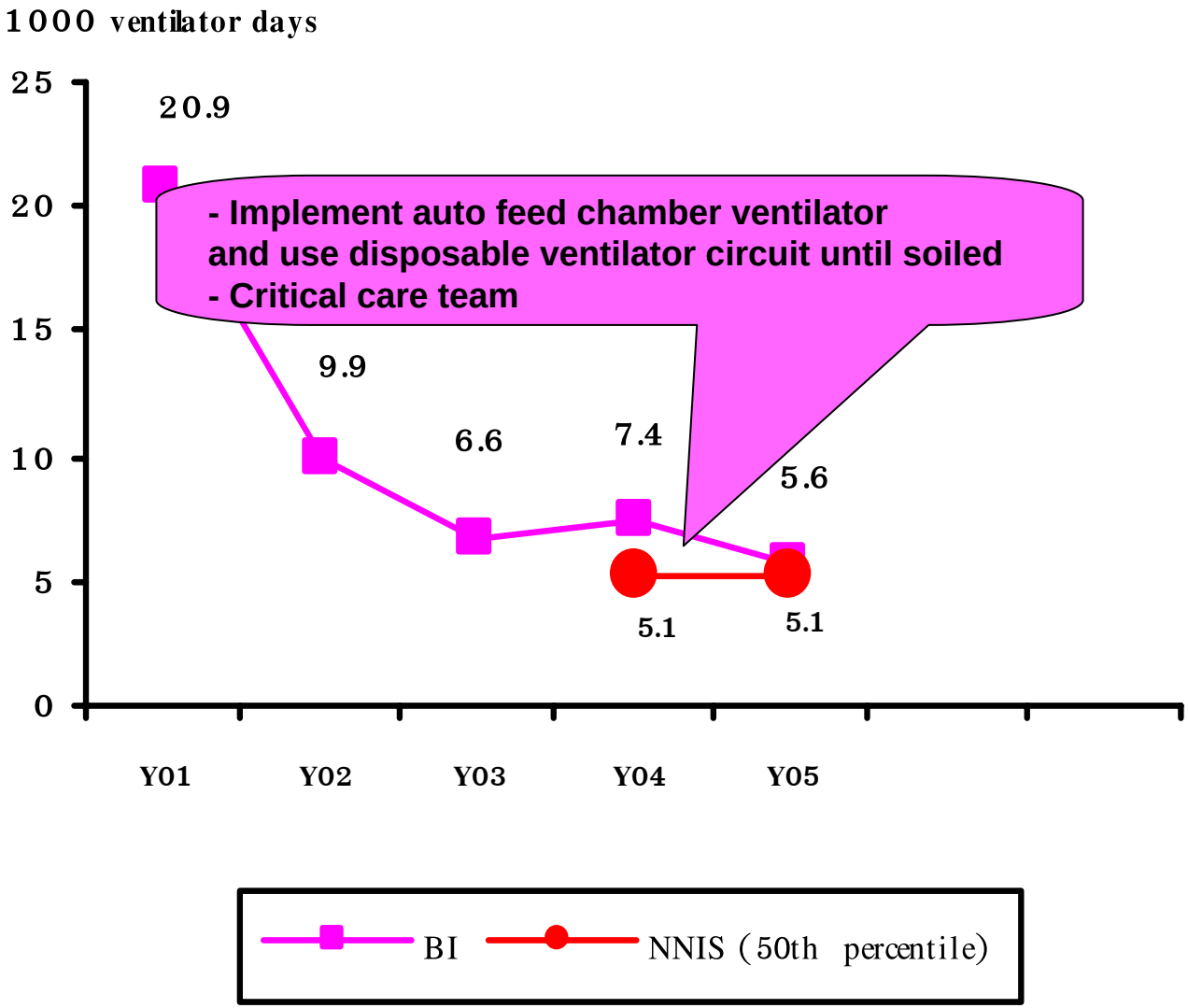


Using disposable ventilator circuit until soiled cost effective > every 7d

-Implement auto feed chamber ventilator and use disposable ventilator circuit until soiled
- Critical care team

Evidence base: Changing ventilator circuit until soil

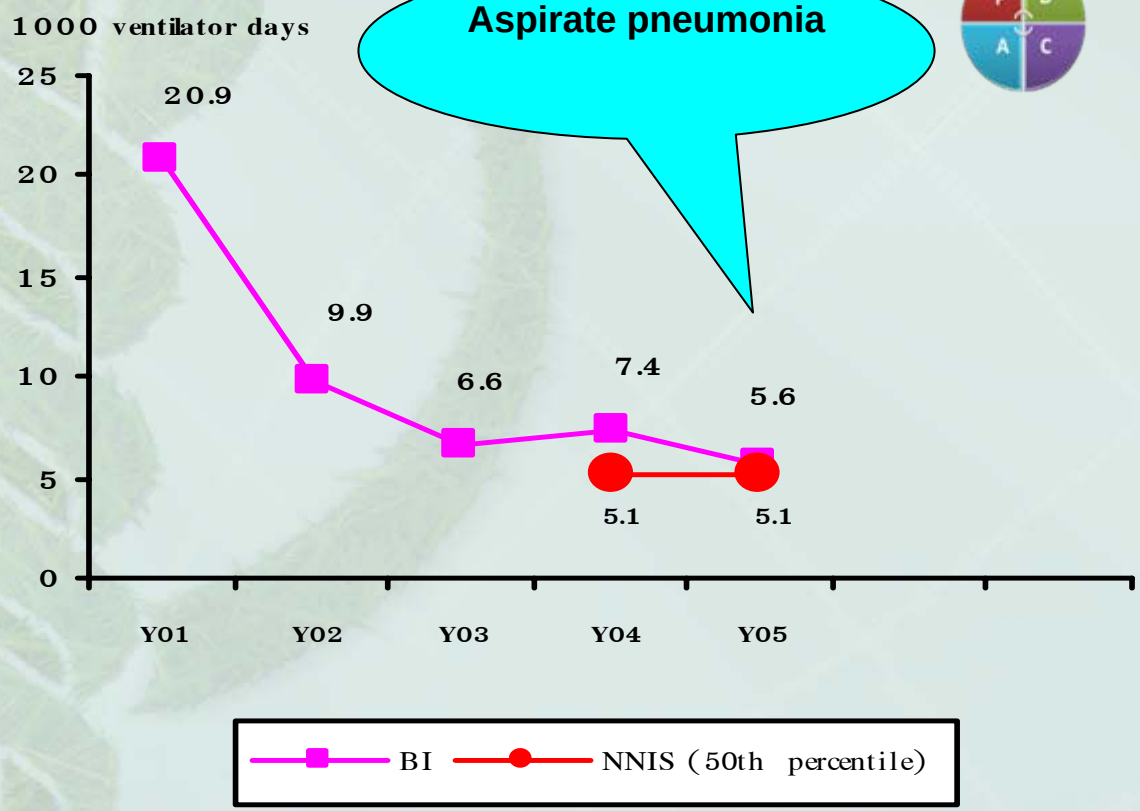
Ventilator associated Pneumonia (VAP)



- Yankauer

Organism	Y04 Organism = 52	Y05 Organism = 27
Pseudomonas aeruginosa *MDR*	32.69% (17) 11.76% (2)	37% (10) 70% (7)
Stenotrophomonas maltophilia *MDR*	17.30% (9)	18.51% (5) 40% (2)
Acinetobacter calco baumanii	9.61% (5)	14.48% (4)
Ventilator day average	17	24
Range	2->4 months	4-99 days
Risk factor	Immuno-suppression+Aspiration	Immuno-suppression +Compromise- host

Ventilator associated Pneumonia (VAP)



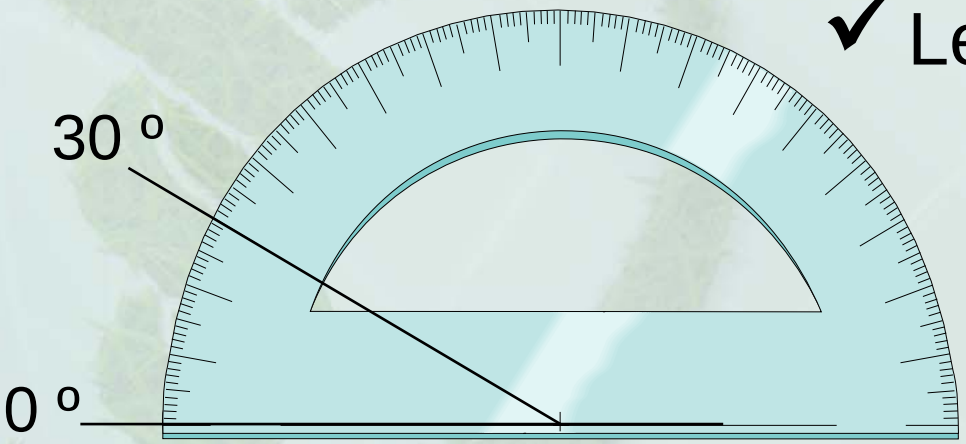
Aspirate pneumonia

-Retraining tube feeding care
- HOB Elevation 30°-45°

HOB Elevation 30-45 Degrees

CDC Guideline for Prevention of Healthcare Associated Pneumonias 2003
Drakulovic et al, Lancet 1999;354:1851

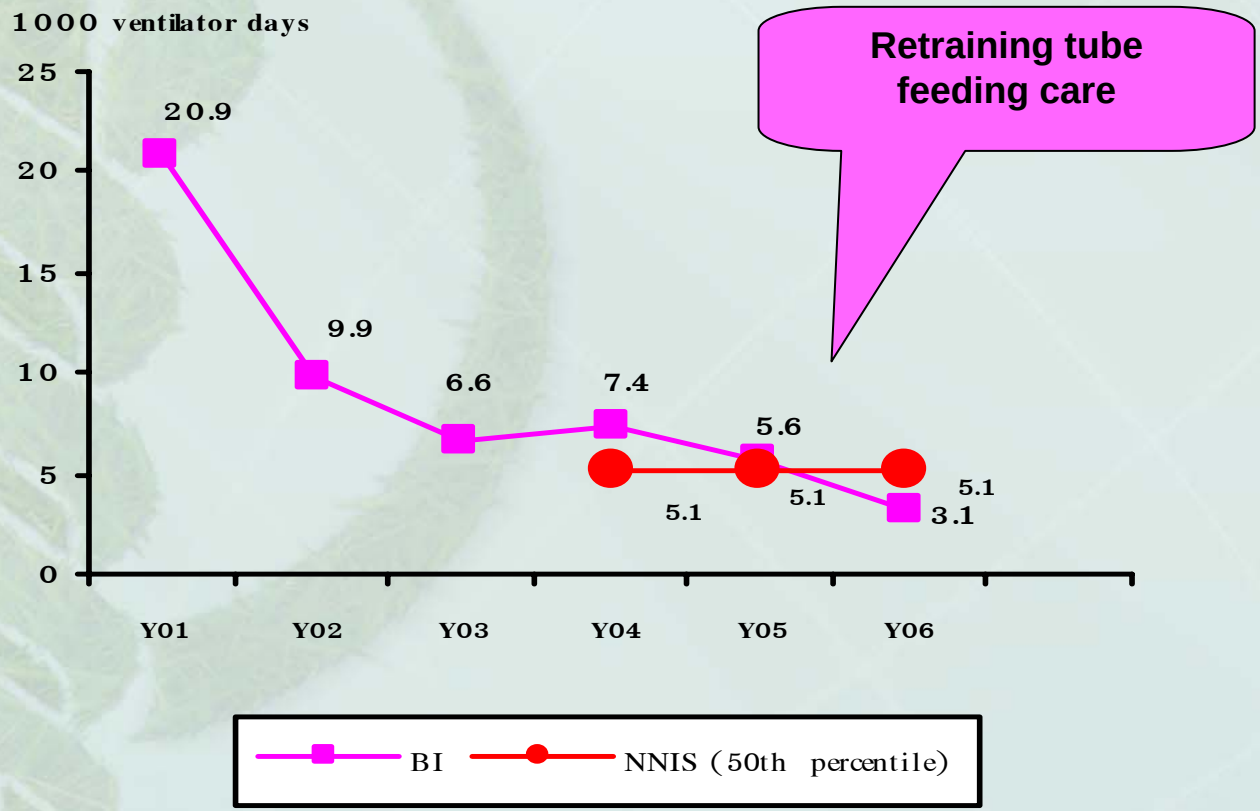
HOB Elevation 30-45 Degrees



- ✓ All intubated patients
- ✓ All patients on enteral feeds
- ✓ Level II recommendation

Reduces Reflux & Aspiration of G(-) Bacteria

Ventilator associated Pneumonia (VAP)

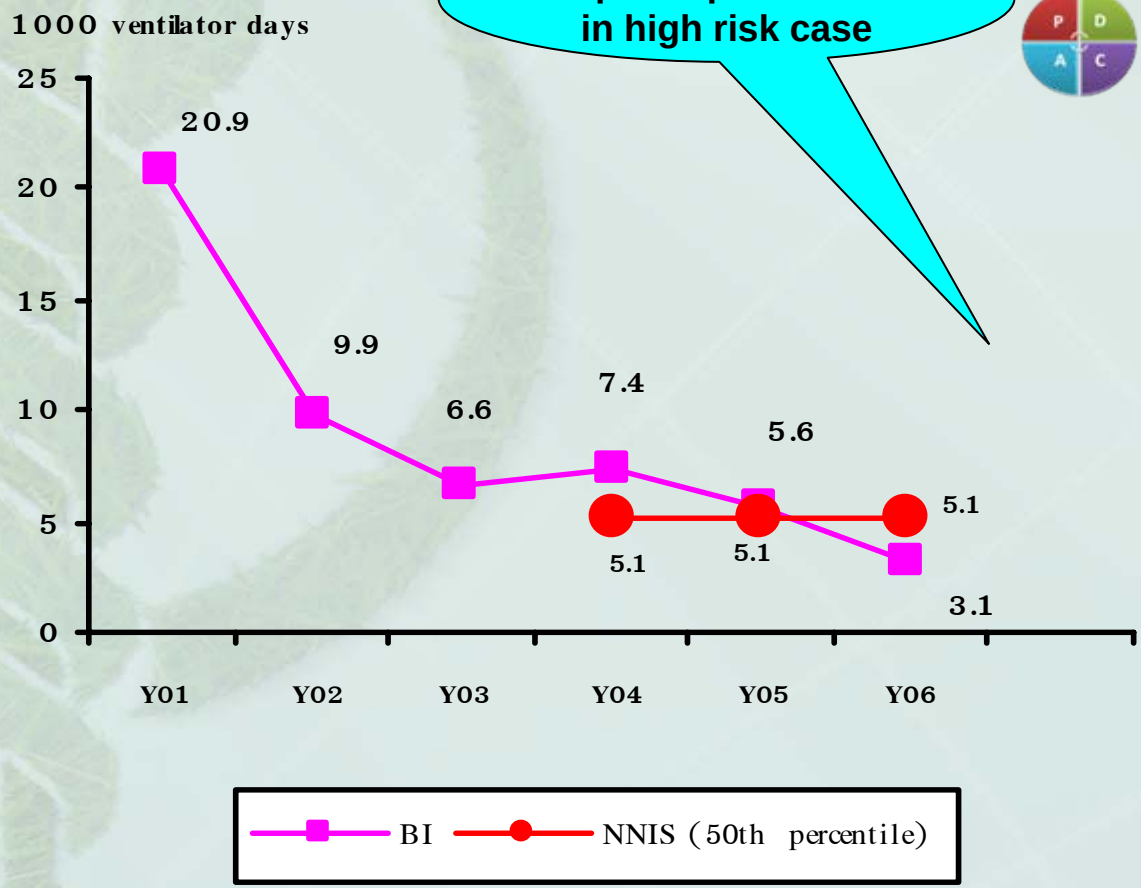


Organism	Y04 Organism = 52	Y05 Organism = 27	Y06 Organism = 17
Pseudomonas aeruginosa *MDR*	32.69% (17) 11.76% (2)	37% (10) 70% (7)	29% (5) 60% (3)
Stenotrophomonas maltophilia *MDR*	17.30% (9)	18.51% (5) 40% (2)	17.65% (3)
Acinetobacter calco baumanii	9.61% (5)	14.48% (4)	17.65% (3)
Ventilator day average	17	24	24
Range	2->4 months	4-99 days	4-99 days
Risk factor	Immuno-suppression+Aspiration	Immuno-suppression +Compromise- host	Immuno-suppression+ Lung disease

Portex® Blue Line ULTRA® Suctionaid® Tracheostomy Tubes

Soft-Seal™ cuff low pressure,
high volume cuff for minimal trauma while providing effective seal:

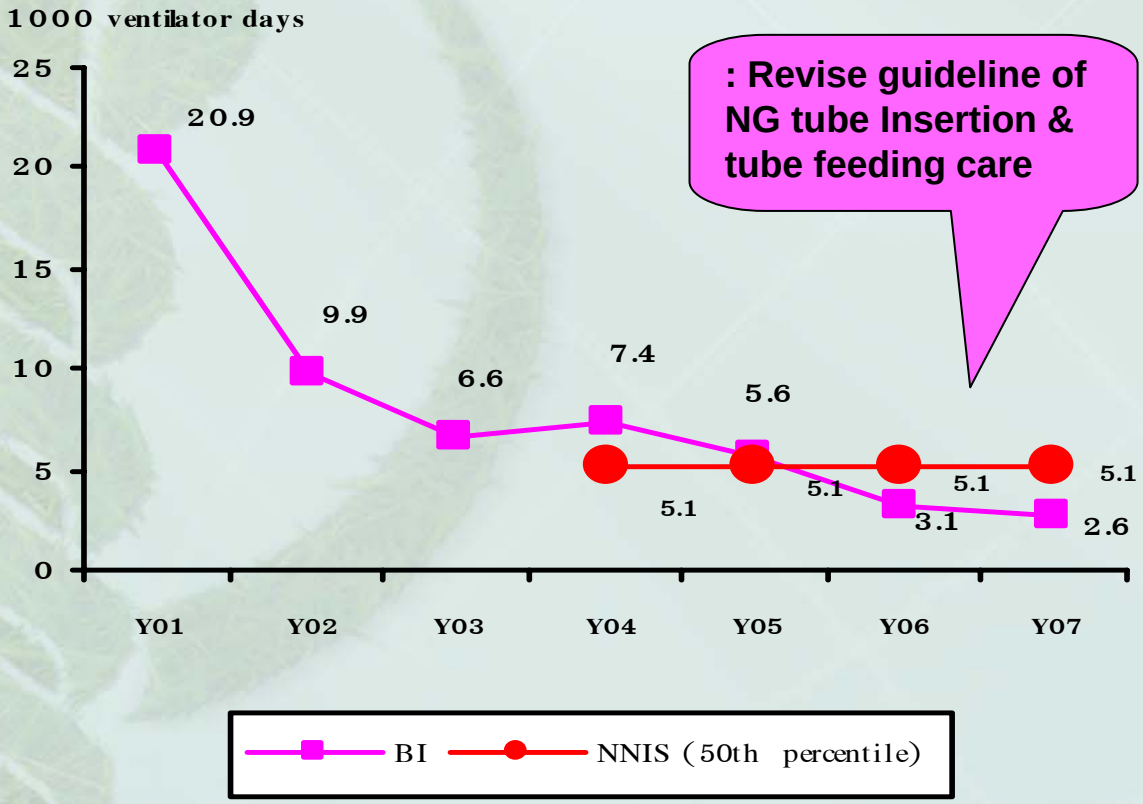
Ventilator associated Pneumonia (VAP)



Aspirate pneumonia in high risk case

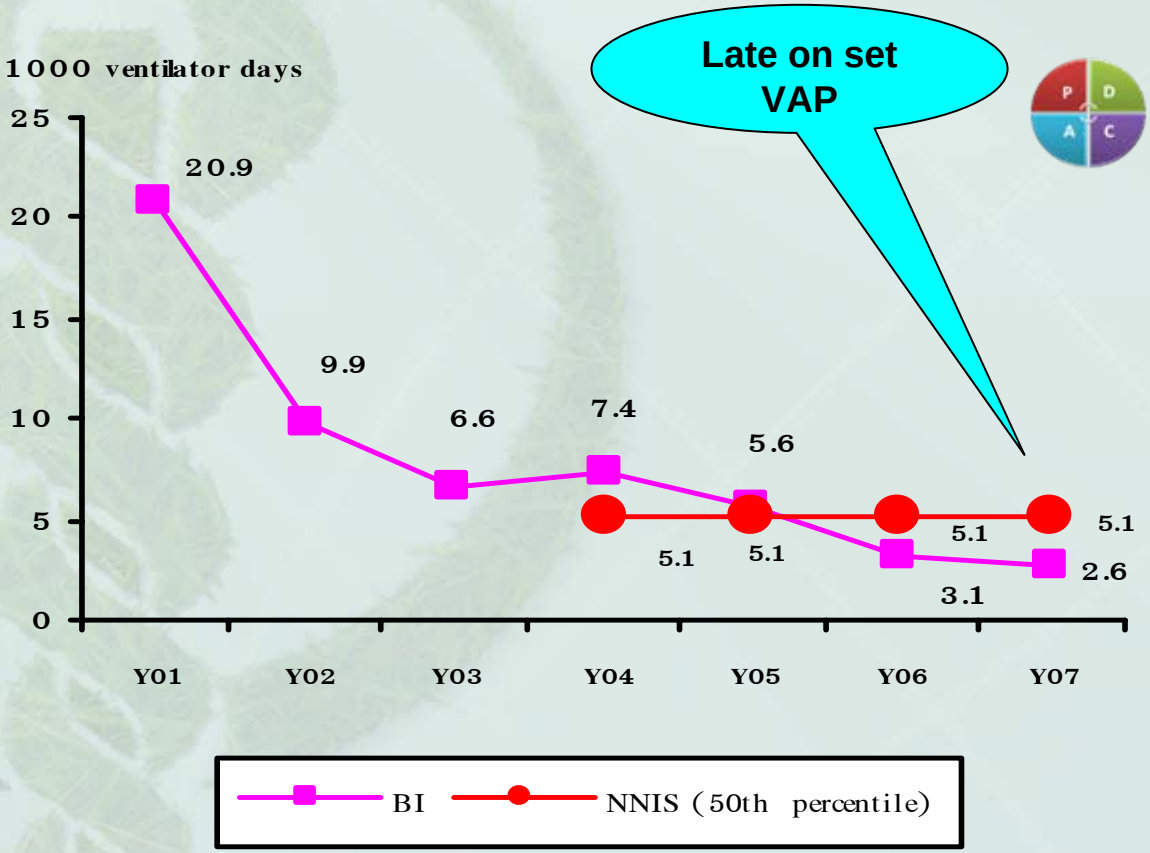
: Revise guideline of NG tube Insertion & tube feeding care

Ventilator associated Pneumonia (VAP)



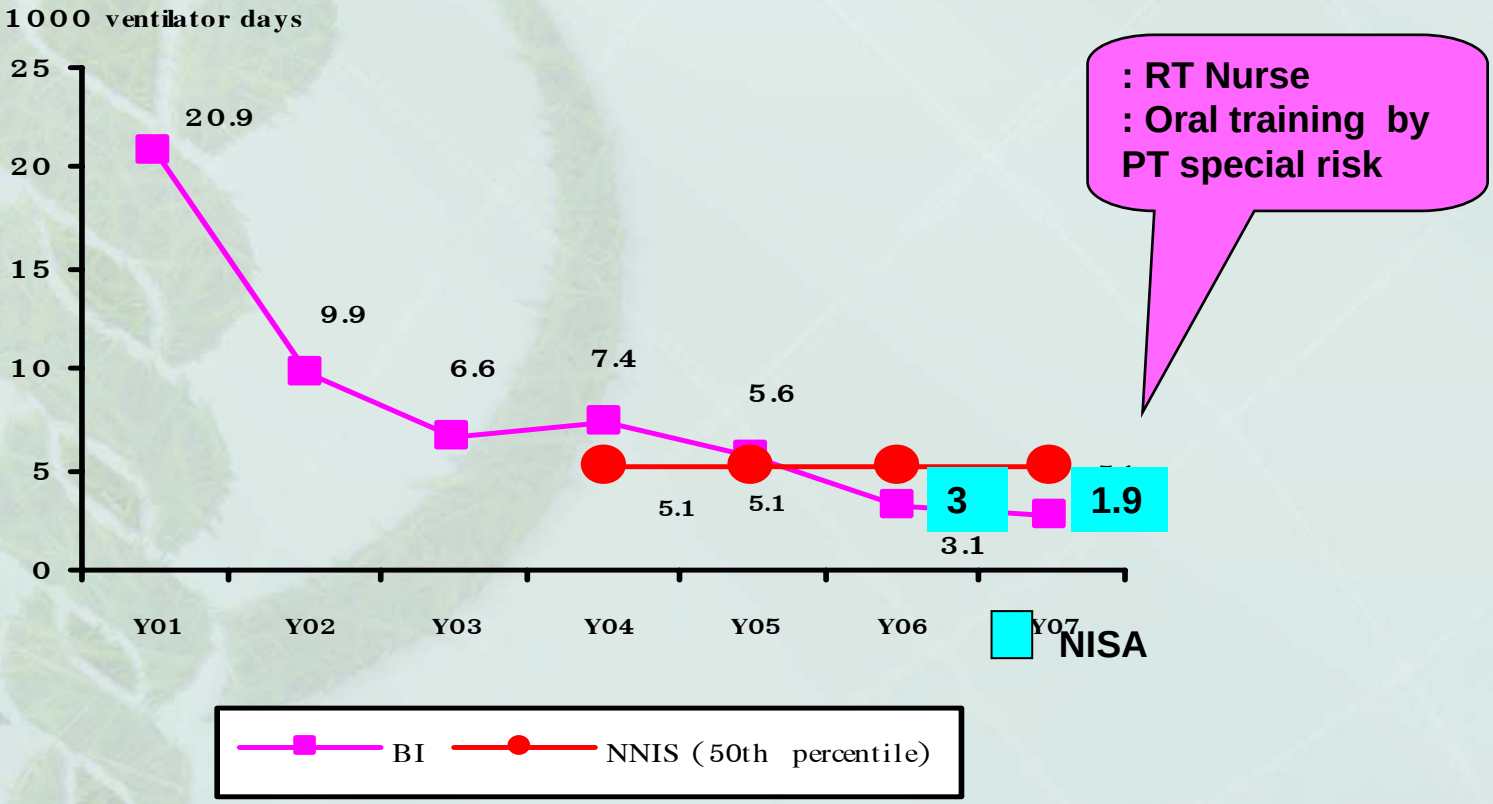
Organism	Y04 Organism = 52	Y05 Organism = 27	Y06 Organism = 17	Y07 Organism = 16
Pseudomonas aeruginosa	**32.69%** (17)	**37%** (10)	**29%** (5)	**43%** (7)
MDR	**11.76%** (2)	**70%** (7)	**60%** (3)	**57%** (4)
Stenotrophomonas maltophilia	**17.30%** (9)	**18.51%** (5)	**17.65%** (3)	**25%** (4)
MDR		**40%** (2)		
Acinetobacter calco baumanii	**9.61%** (5)	**14.48%** (4)	**17.65%** (3)	-
Ventilator day average	**17**	**24**	**24**	**16**
Range	**2->4 months**	**4-99 days**	**4-99 days**	**7-43 days**
Risk factor	**Immuno-suppression+Aspiration**	**Immuno-suppression +Compromise- host**	**Immuno-suppression+ Lung disease**	**Surgery of Head / Neck & Chronic lung disease**

Ventilator associated Pneumonia (VAP)

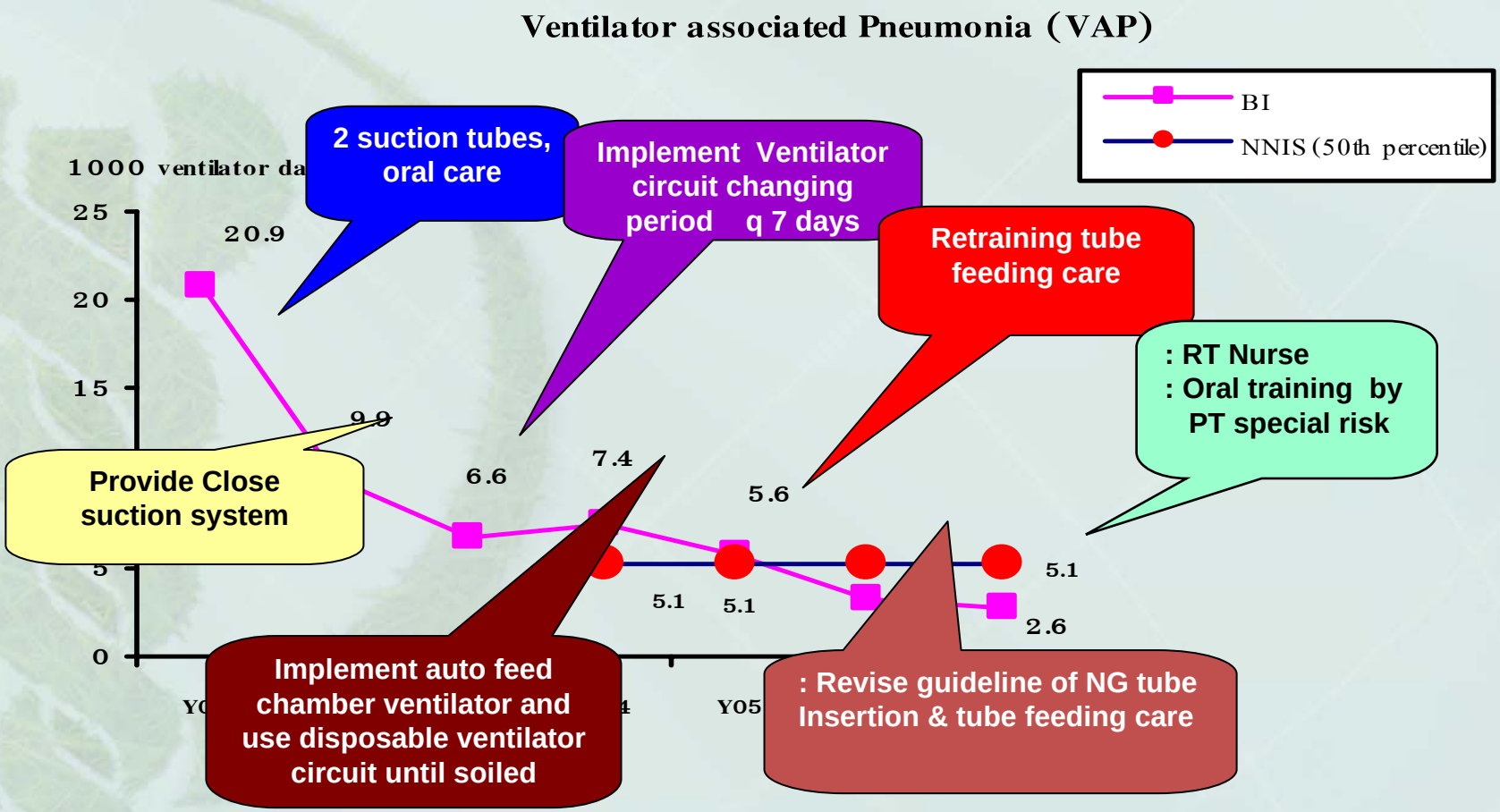


: RT Nurse
: Oral training by PT special risk

Ventilator associated Pneumonia (VAP)



Ventilator associated Pneumonia (VAP)



CEO

Step 1

CMO

Step 4

CFO

Step 2

Alcohol waterless hand rub with Automatic dispenser

Asst MD

Step 5

COO

Step 3

DON

Step 6

ล้างมือทั้งก่อนและหลังรับประทานอาหารและเข้าห้องน้ำ

Before and After eating & use the toilet

ล้างก่อน ป้องกันตัวคุณ Before : Protect your self

ล้างหลัง ป้องกันคนไข้ After protect your patient

ผลิตโดย แผนกควบคุมโรคติดเชื้อ โรงพยาบาลบำรุงราษฎร์


Fishki.net

The Ventilator Bundle

….is a package of evidence-based interventions that, when implemented together for all patients on mechanical ventilation, results in dramatic reduction in the incidence of ventilator-associated pneumonia.

VAP bundle

- Head of bed elevation 30 degrees or greater
- Daily “sedative interruption” and daily assessment of readiness to extubate
- PUD (peptic ulcer disease) prophylaxis
- DVT (deep venous thrombosis) prophylaxis

Seven strategies to prevent VAP: a look at the evidence

Why some popular approaches, from handwashing to good oral hygiene, may not be as evidence-based as you think

by Bonnie Darves

Published in the May 2005 issue of Today's Hospitalist

6. Stress ulcer prophylaxis. This intervention recently received a nod from the Institute for Healthcare Improvement, in part because the use of sucralfate has been shown to reduce gastric bleeding and VAP.

Other agents such as H2 blockers, antacids and proton-pump inhibitors may offer similar effects, but experts say that studies looking at these strategies have been underpowered. In general, the role of gastric pH in development of VAP remains poorly understood, and the practice could increase infection risks in some patients.

7. Selective digestive tract decontamination. While this practice is widely used to prevent VAP in Europe, experts say that it doesn't translate well to North America. The problem has to do with well-known antibiotic-resistance issues in ICUs.

"There is some new literature on this," Dr. Dodek says, "so it's something we will revisit. We're not sure this is ready for prime time."

We need to focus on the interventions that we know do work, not on what might work," says Dr. Dodek, who was lead author of the VAP-prevention clinical practice guideline published in the Aug. 17, 2004, Annals of Internal Medicine.

Lessen learn

- ค้นหาประเด็นที่เป็นของเราเองให้ได้
- **Cost effective** อาจใช้ไม่ได้ผลกับ **Patient safety**
- การแก้ไขให้เริ่มจาก - **Behavior**
  - **Knowledge &Awareness**
  - **Equipments**
- ทำให้เป็น **routine**

Be excellence
Be determinal
Be strong
Be flexible

Thank you


Annual KM Division Seminar
We want to be Real Good and Have Fun