

Ministry of Public Health

15.02.1999

Royal Decree

Evaluation of “medical activity”

College of physicians for IC function

- Quality indicators
- Evaluation criteria
 - structure, staff, practice
- Model of recording
- ICU Visits and control of data
- Annual report for a working group
 - hospital managers
 - public health minisery, RIZIV
 - health insurance
- Feed back, responses

College of physicians for IC function

Current Board :

- Luc Huyghens (President)
- Dominique Biarent
- Pierre Damas
- Etienne Installé
- Raf De Jongh
- Koen Vandewoute
- Leo Bossaert
- Thierry Sottiaux

Evaluation of NIV practice in ICU Epidemiologic survey

Koen Vandewoute
Pascal Reper
Thierry Sottiaux

Evaluation of NIV practice in ICU

Epidemiologic survey

- "*Questionnaire*" as simple as possible to maximize the rate of responses
- General assessment of the use of NIV
- Static "photo" of ICU 20th october 2004 from 8am to 2pm
- Limited duration of observation
- 3 min bedside work

Evaluation of NIV practice in ICU

1. General survey
2. Baseline conditions 20th october 2004
3. Patients evaluation

Evaluation of NIV practice in ICU

140 ICU centers were contacted

1. General survey

42 responses (726 beds)

2. Baseline conditions 20th october 2004

44 responses (599 patients)

only 35 ICU make responses at both

3. Patients evaluation

45 responses

61 NIV patients in 27 ICU

General Survey of ICU Structure NIV general strategy

140 ICU centers were contacted

42 answers

42 different doctors

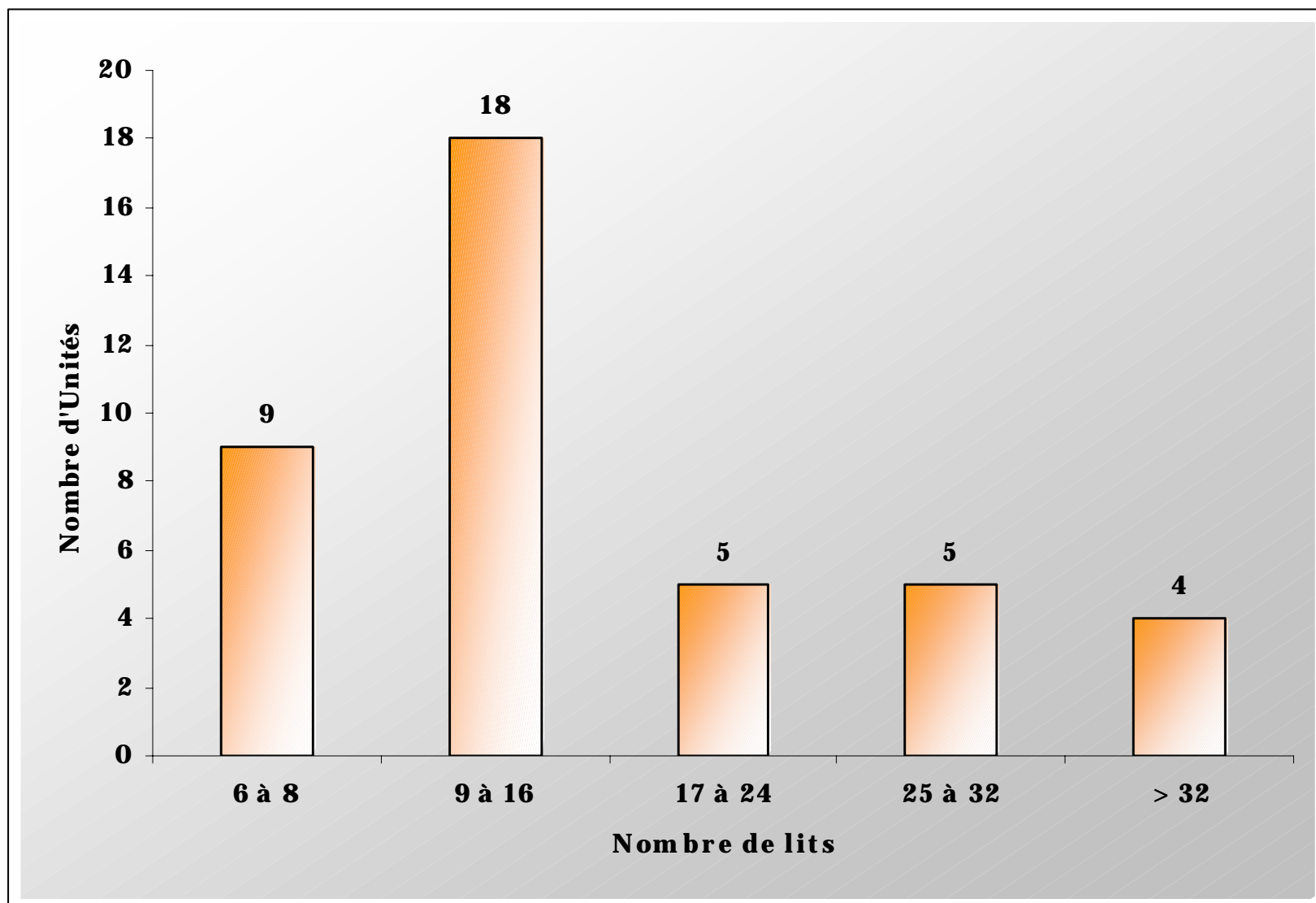
42 ICU (or sub-units)

Total beds 726

Beds/Unit

Mean 17,3 +/- 12,5

Médian 12



Number of patients admitted in 2003

41 USI

47.740 patients

mean **70,7 ± 15,5**

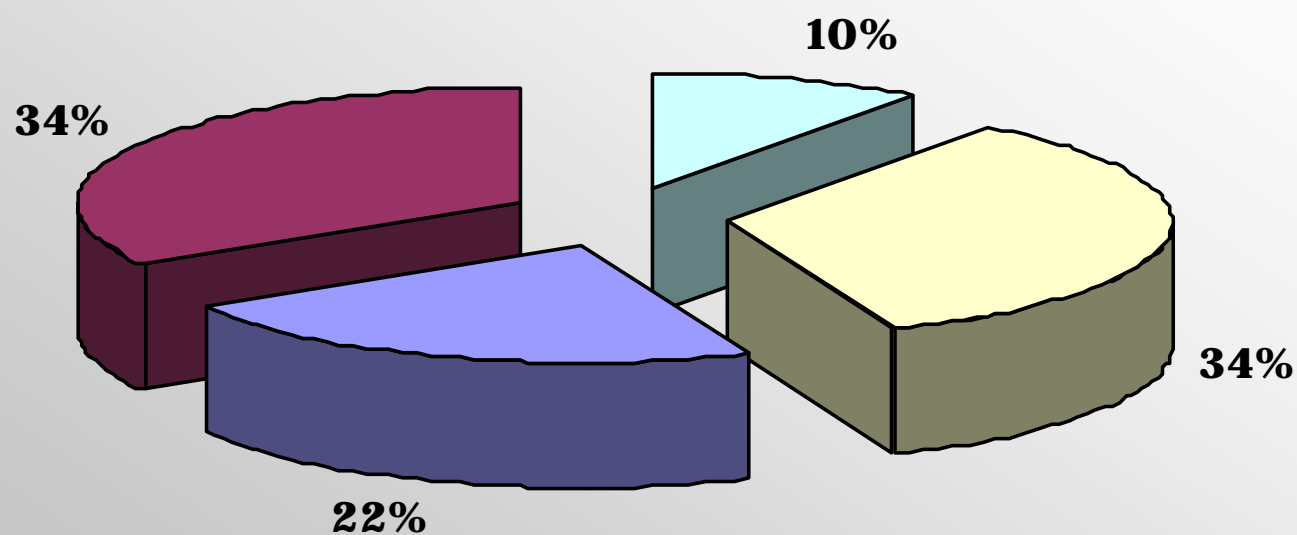
admissions/bed/year

Median

68,6

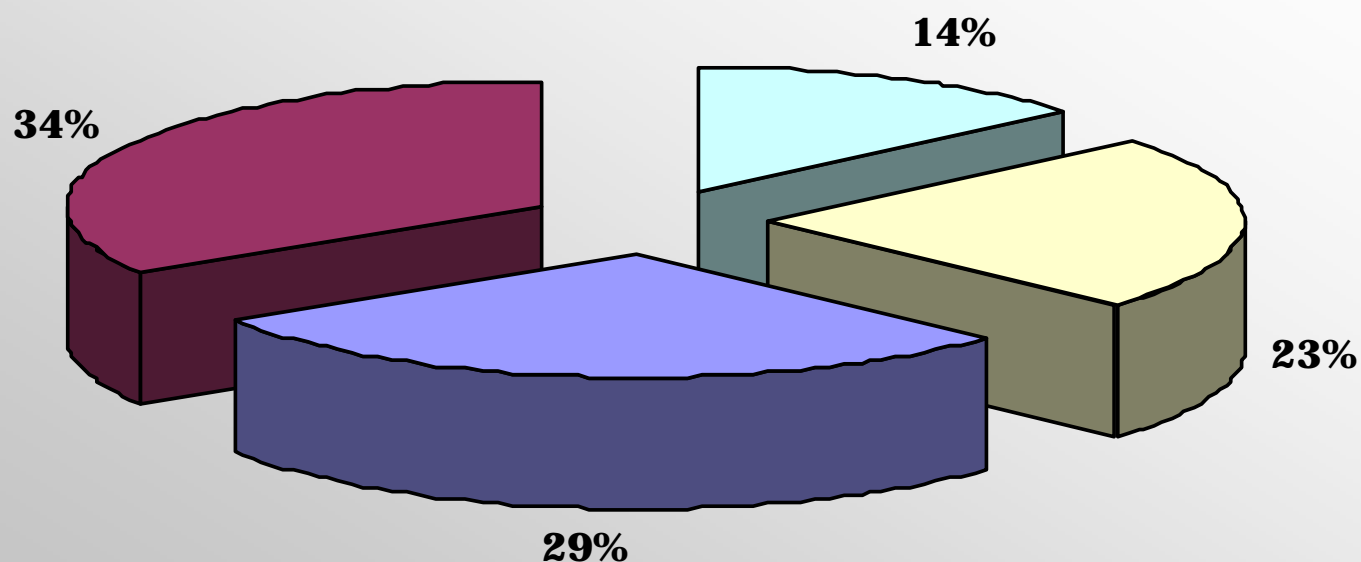
admissions/bed/year

NIV in Emergency department



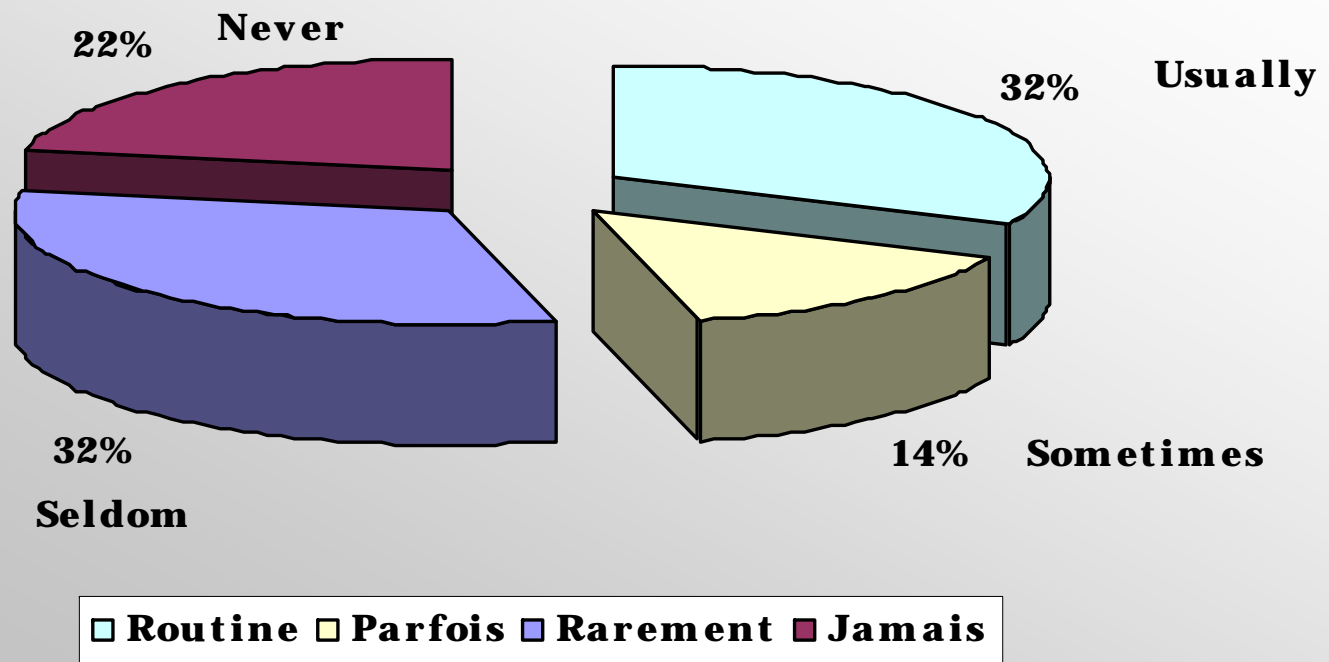
□ Usually □ Sometimes □ Seldom □ Never

NIV in Pneumology for "acute" patients



□ Usually □ Sometimes □ Seldom □ Never

NIV in Pneumology for "chronic" patients



Convention: 27/40

ICU Respirators 42 ICU

Total **693**

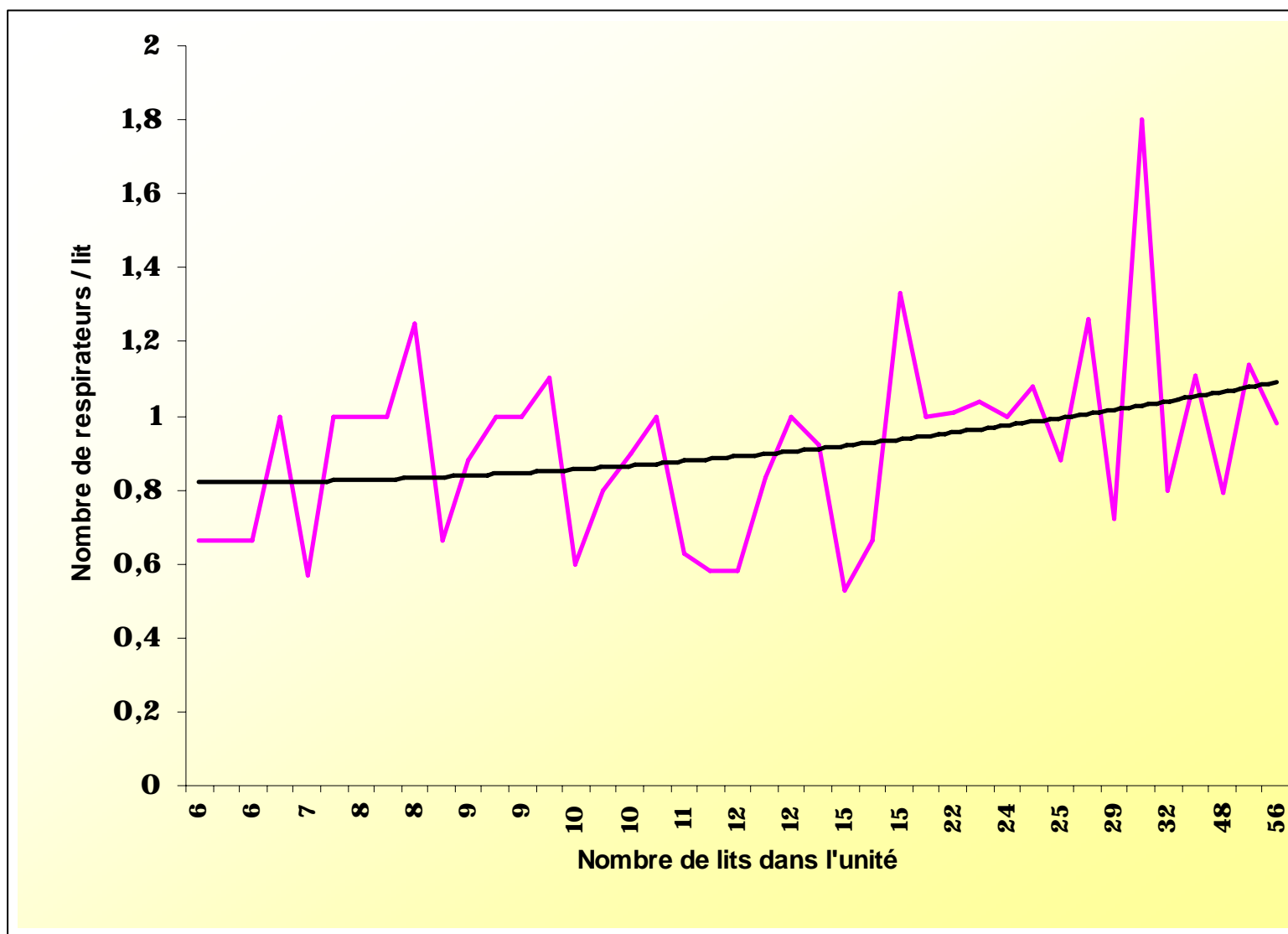
(5 HFO)

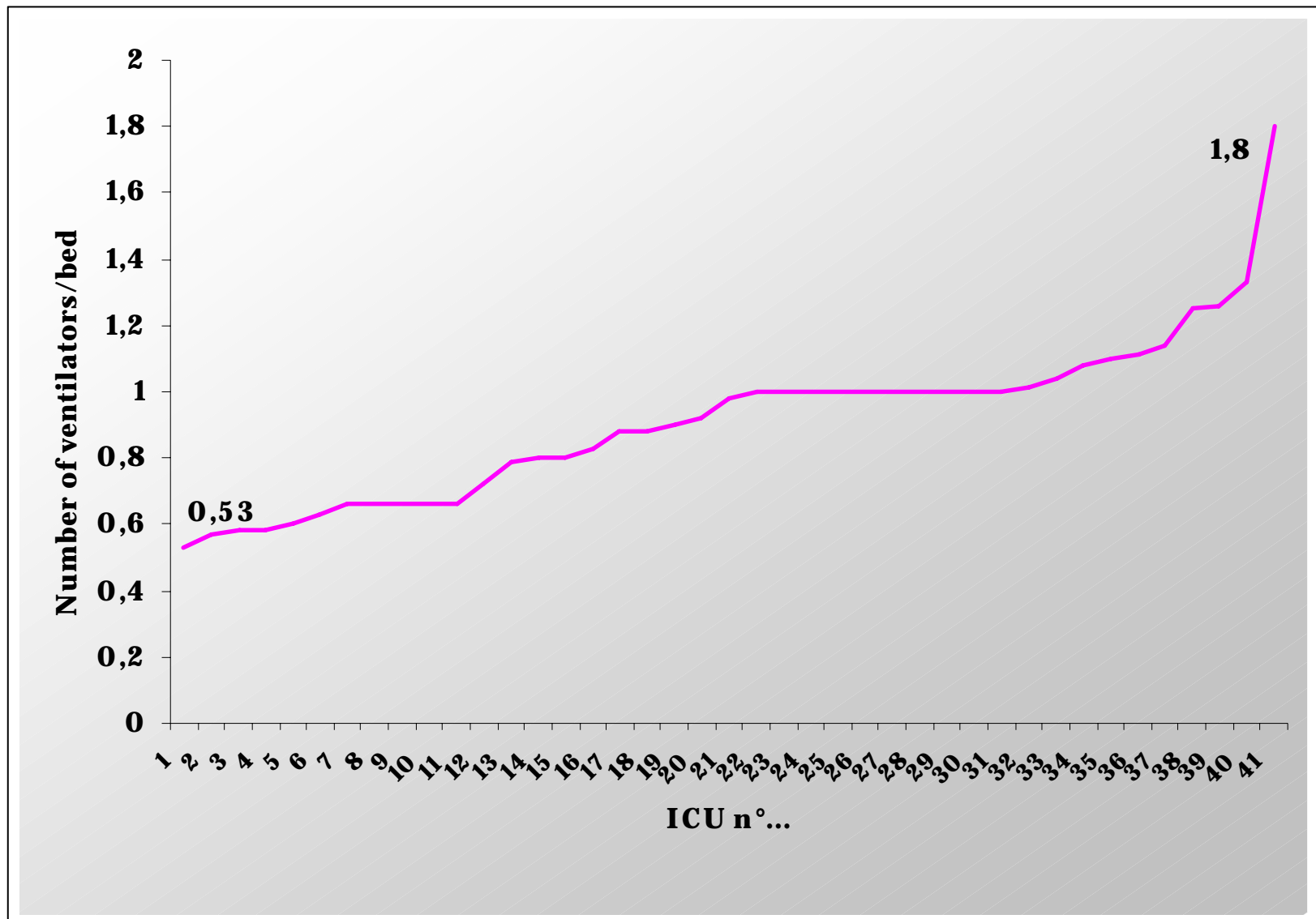
Number of ICU ventilator / ICU bed :

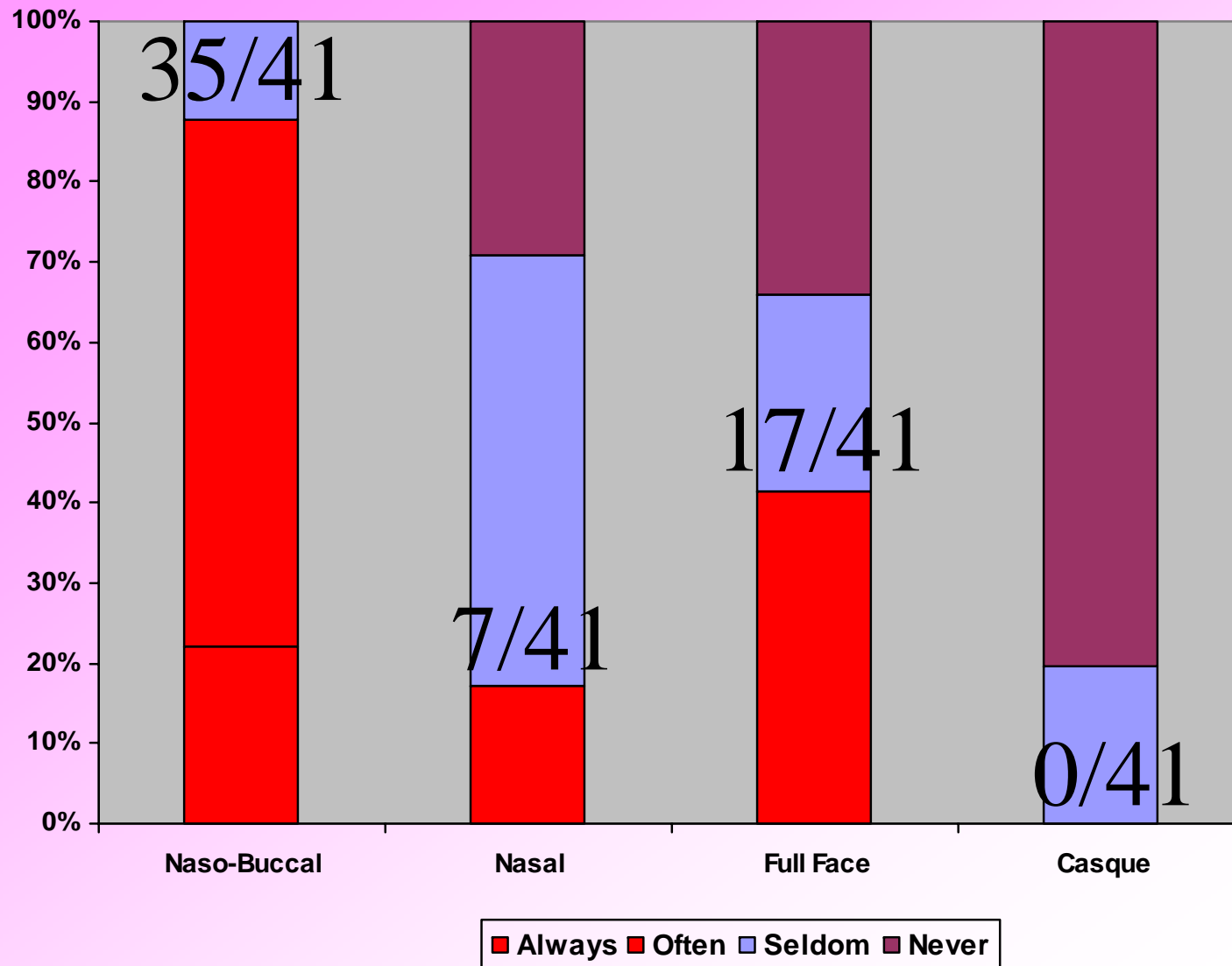
ICU N = 42

Mean 0,91+/-0,26

Médian 0,95







5 ICU/41 use preferentially the full face mask and use rarely the naso-buccal mask

Humidification

N=41

CHAUFFANTS		ECH	
Jamais	15	4 jamais	
		3 rarement	
		3 souvent	
		5 toujours	
Rarement	11	2 jamais	
		1 rarement	
		8 souvent	
Souvent	6	2 jamais	
		2 rarement	
		2 souvent	
Toujours	8	8 jamais	

Humidification

N=41

4 *Never*

6 *Seldom*

31 *Often*

9	HH only
5	HME only
17	Both

Humidification

N=41

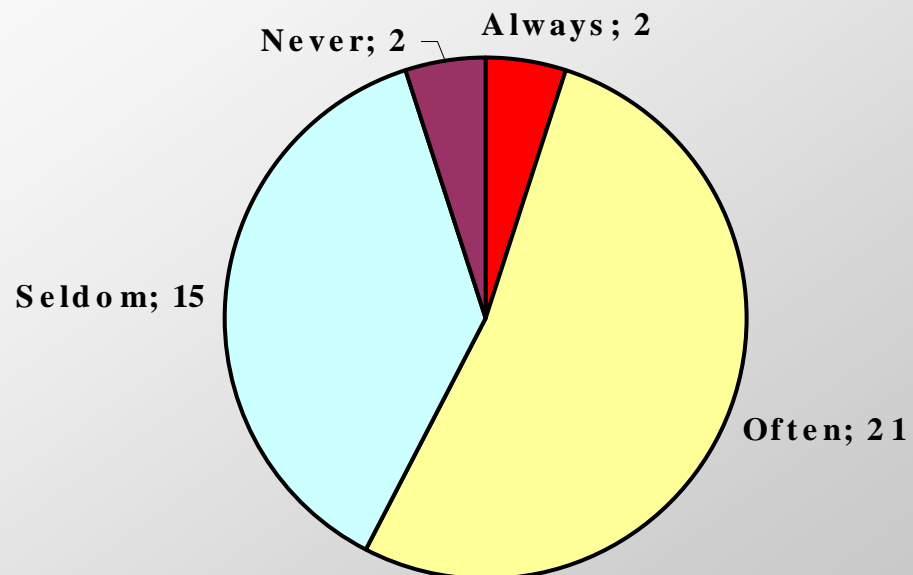
10 ICU : never or seldom
humidification

5 ICU : only HME

8 ICU : only HH

CPAP

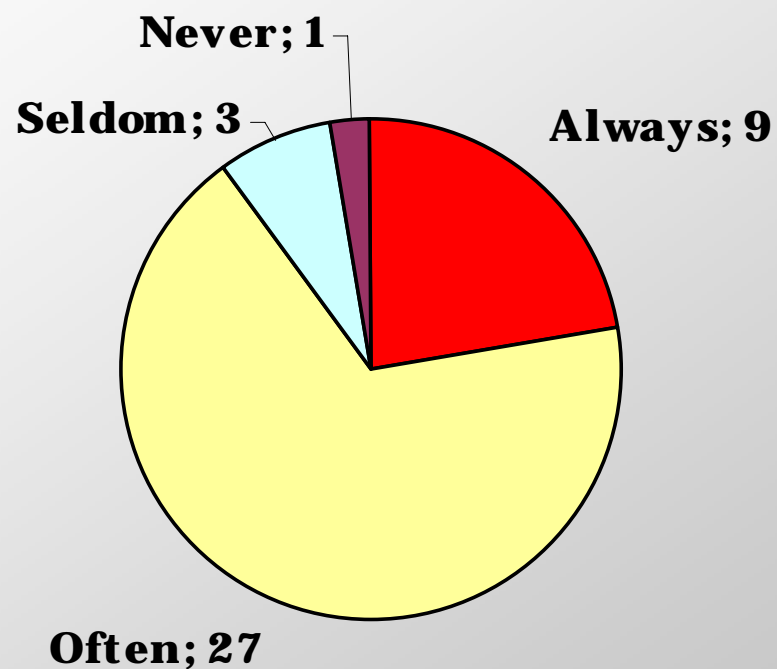
n = 40



■ Always ■ Often ■ Seldom ■ Never

Pressure Support Ventilation

n =40



■ Always ■ Often ■ Seldom ■ Never

Ventilatory Mode

N=40

Volume Control	30 never
	10 seldom

Ventilatory Mode

N=40

Volume Control	30 never
	10 seldom
Pressure Control	19 never
	14 seldom
	6 often
	1 always

Ventilatory Mode

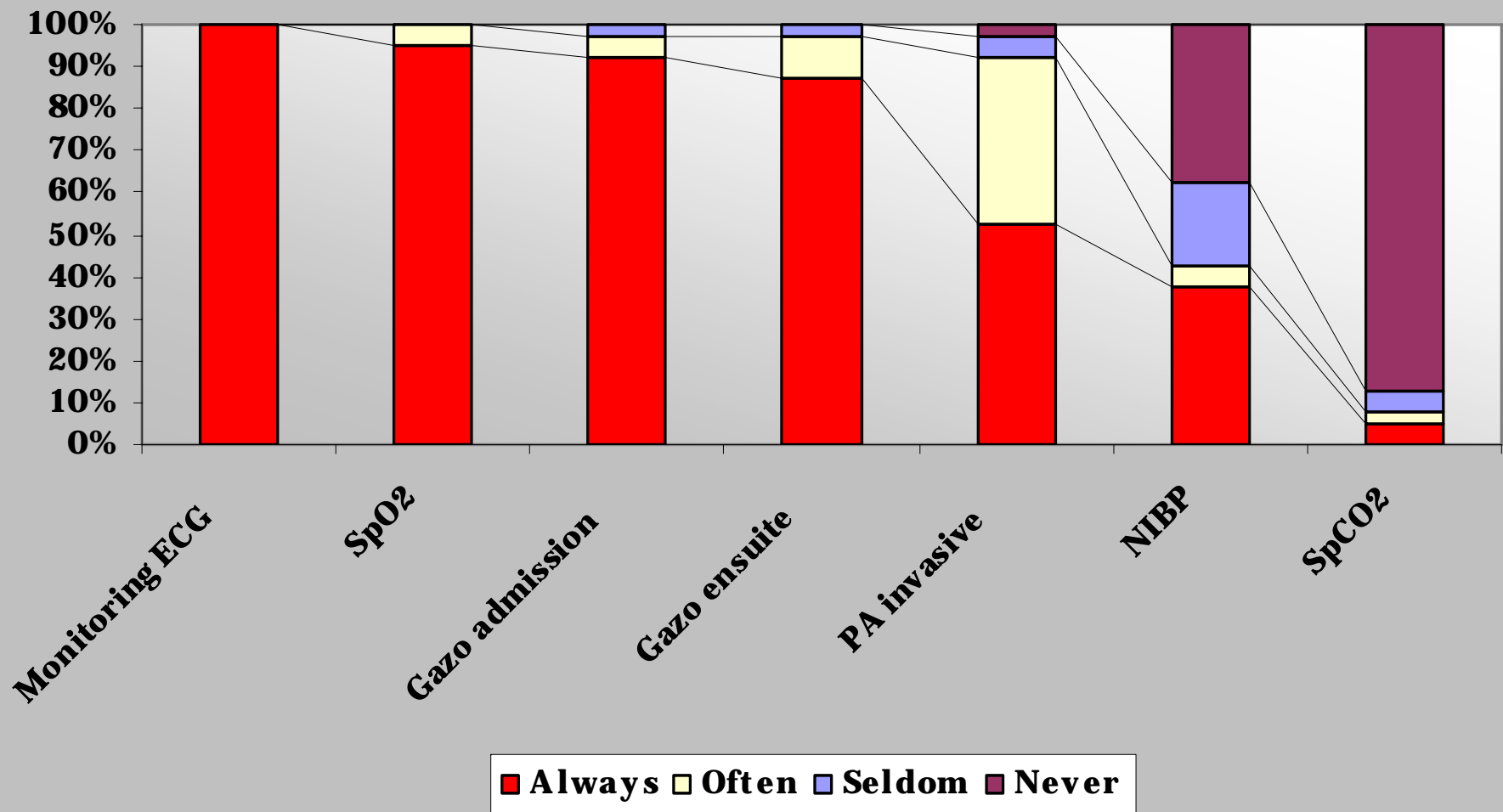
N=40

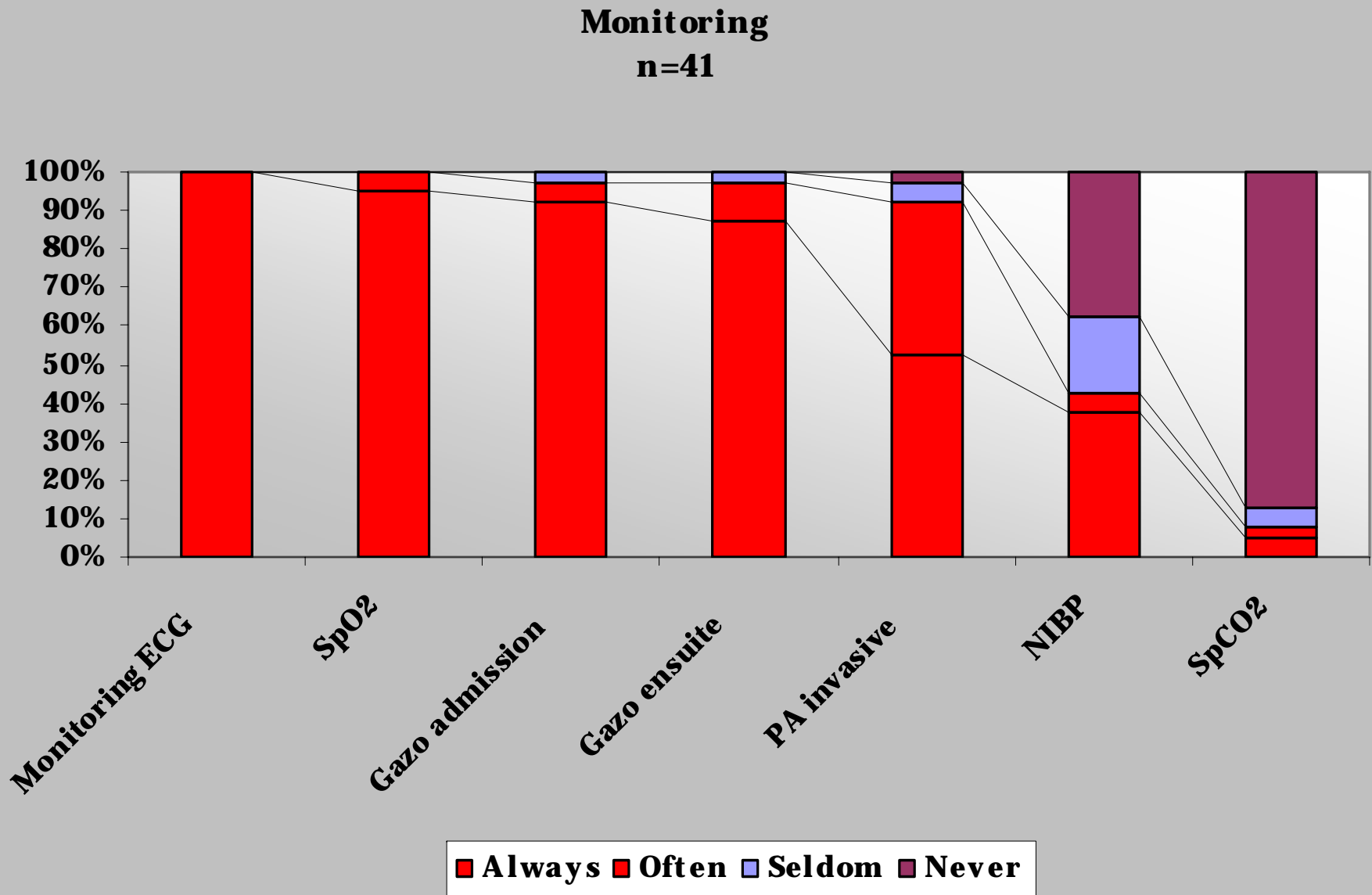
Volume Control	30 never
	10 seldom
Pressure Control	19 never
	14 seldom
	6 often
	1 always
PAV	36 never
	3 seldom
	1 often

Monitoring
Technical approach
Secondary effects

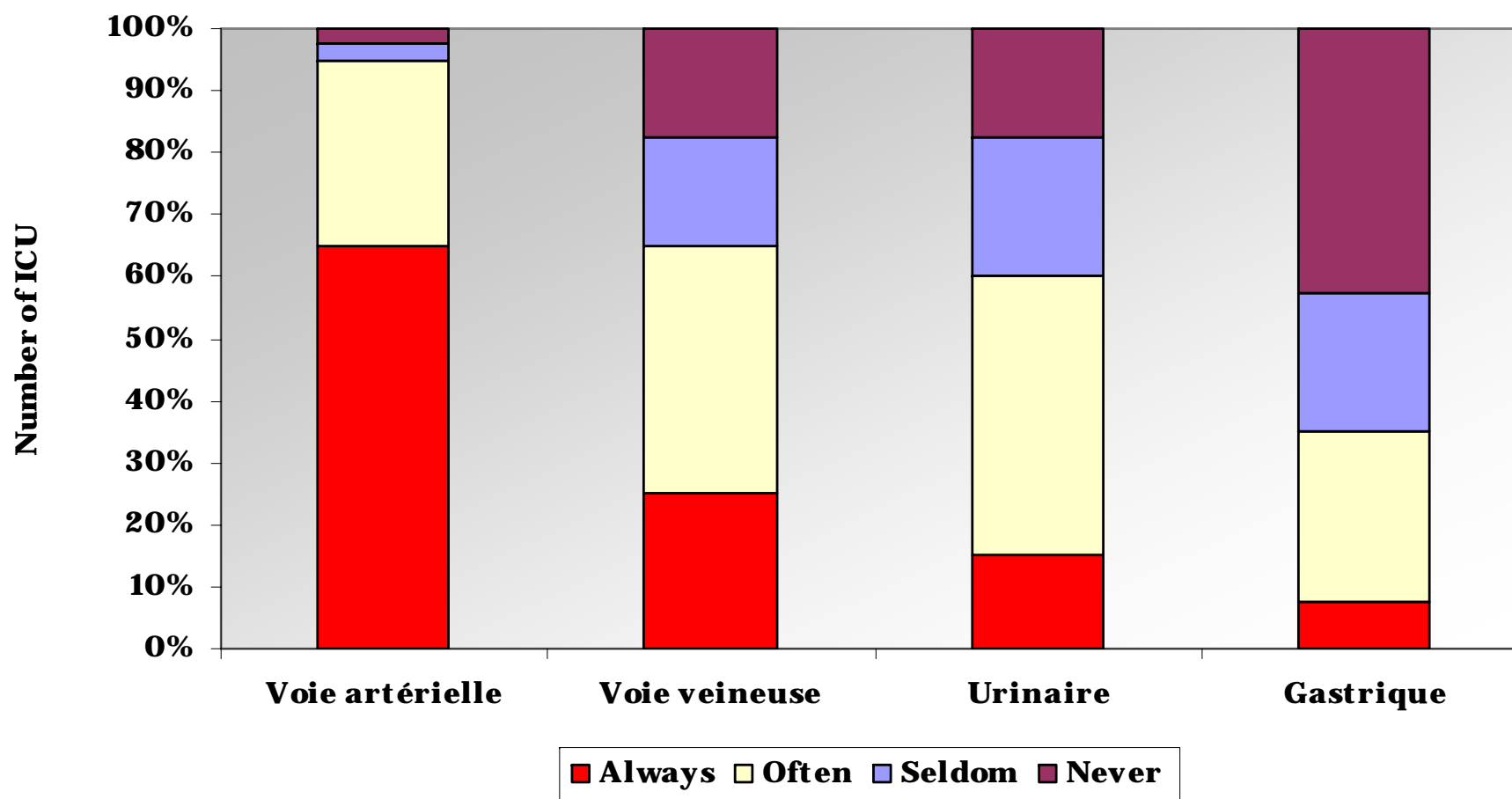
75-100 %	always
50- 75 %	often
25- 50 %	seldom
0- 25 %	never

**Monitoring
n=41**

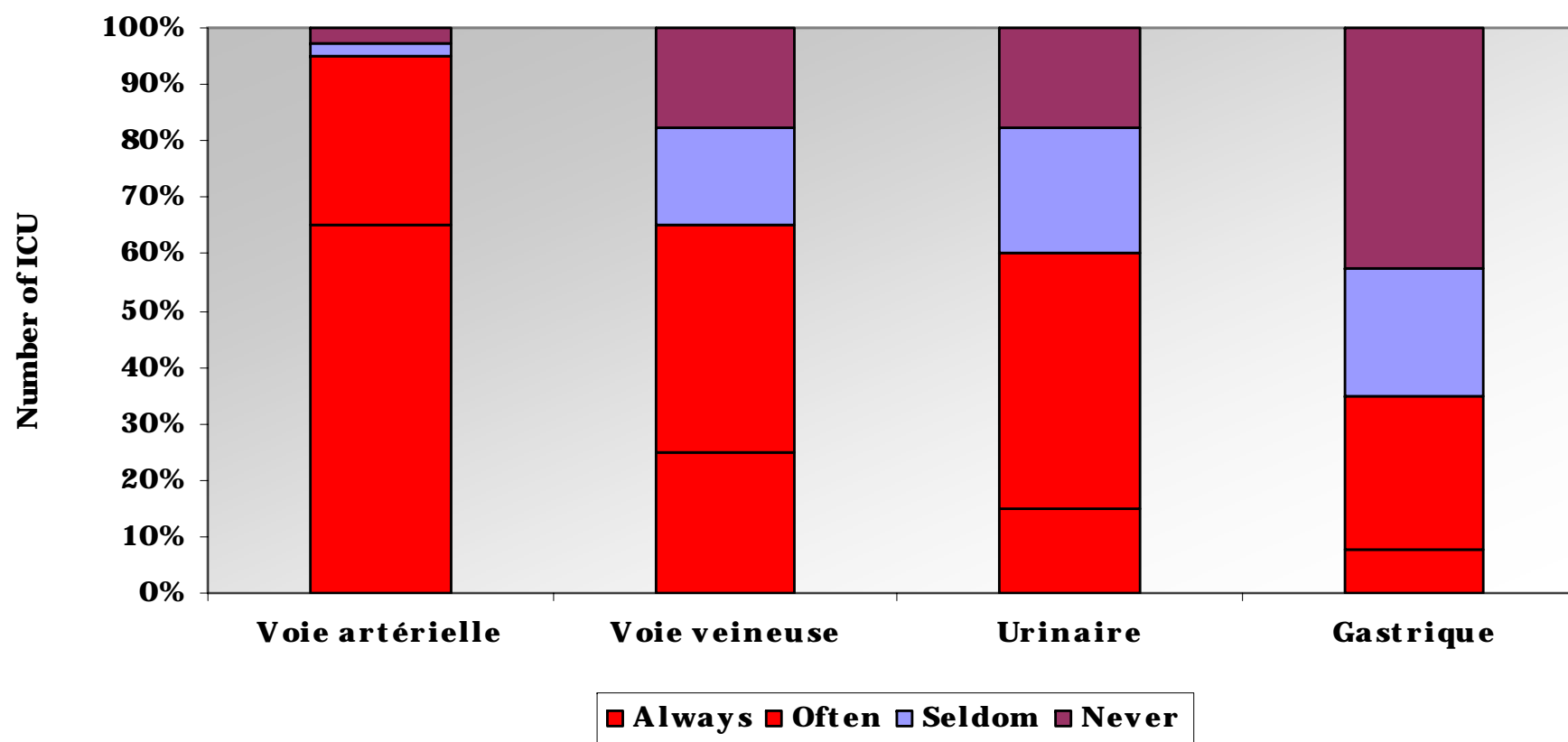




Gestes techniques associés
n=41



Gestes techniques associés
n=41



Secondary effects

n = 40				
	Always	Often	Seldom	Never
Cutaneous	0	9	28	3
Intolerance	0	17	22	1
Vomiting	0	1	25	14
Inhalation	0	2	24	14
Epistaxis	0	0	11	29

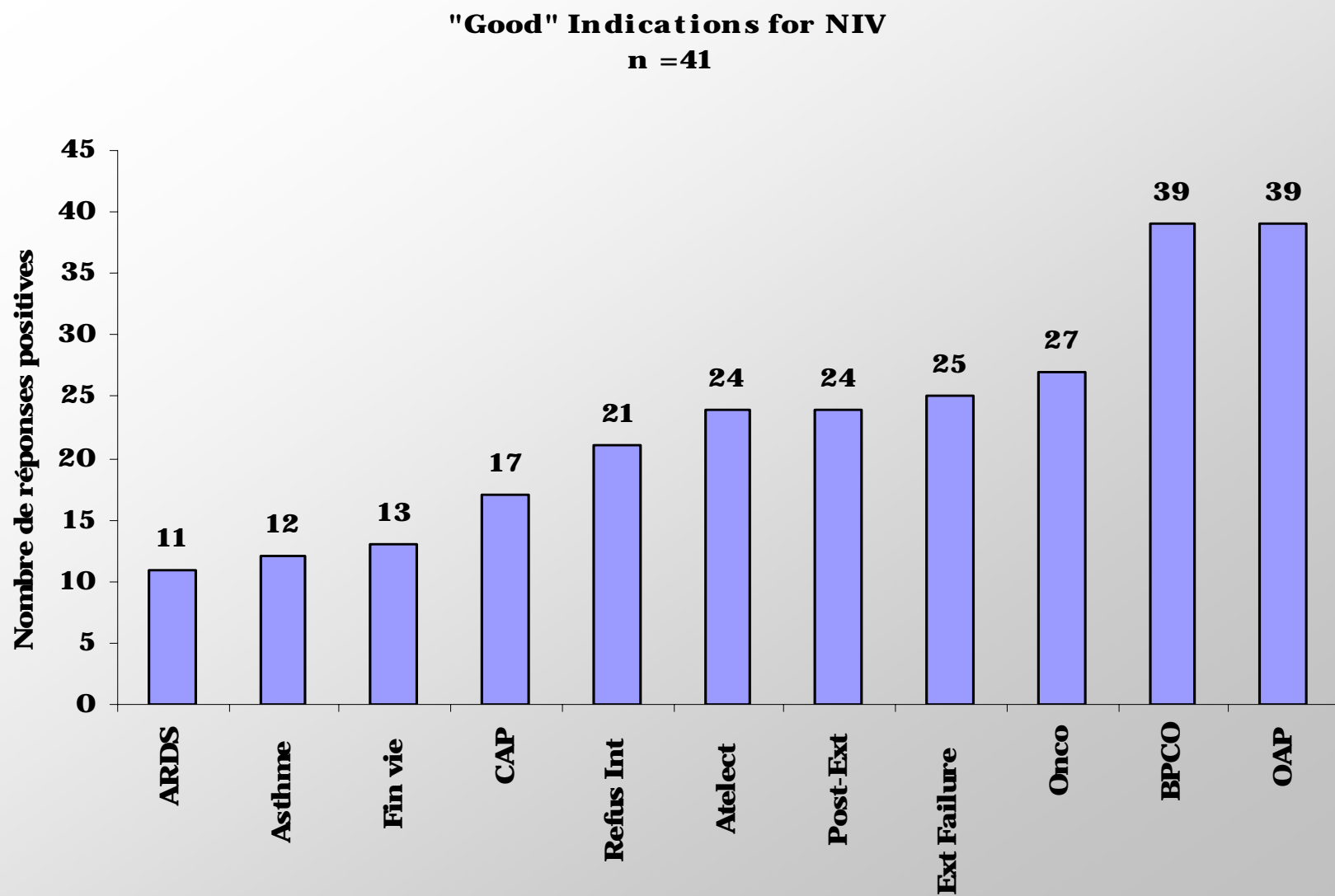
Secondary effects

Vomiting and inhalation are very unfrequent

Epistaxis was not observed

Conjunctivitis is reported frequent in an ICU using
only face mask

The “problem” is : “*intolerance*”



Tarification

Jamais	31
Vent Invasive	3
Mécanique	1
Autre	6

Financement

Ventilators	6	ICU	Physicians Hospital
	34	ICU	
One-use material	1	ICU	Patient Hospital
	39	ICU	

General Survey of ICU

“workload” and “staff”

20th october 2004

20th october 2004

Between 8^{am} and 2^{pm}

N = 44

**6 ICU responded only to the first questionnaire
10 ICU responded only to the second questionnaire
35 ICU responded to both**

20th october 2004

**Total number of patients présents in ICU,
Between 8^{am} and 2^{pm}**

N = 44

Total Patients 599

Number of patient/ICU

Mean 13,5 +/-10,28 (2-49) par USI

20th october 2004

**Total number of patients présents in ICU,
Between 8^{am} and 2^{pm}**

**Médian
10 patients/ICU**

(Median of beds: 12/ICU)

20th october 2004

Taux d'occupation calculé à partir des médecins ayant répondu aux deux questionnaires

Nombre d'USI	35 unités
Nombre de lits	575 lits
Nombre de patients	501 patients
Taux moyen occupation	85,3 +/- 22,7 %

Médiane

92%

20th october 2004

	MV	NIV
8:00 AM	161	41
admitted	66	22
established	11	21
Total	238	84
Médiane	40%	14%

20th october 2004

Intubated patients

Mean **39+/-24%** of the total population

Median: **26%**

20th october 2004

NIV patients

Mean 14,4 +/- 14,4 % of total

Median **10%** of total population

Mean 2 +/- 2,24 patient /ICU

Range 0-10 patients

Median **1 patient/ICU**

20th october 2004

**53% of the ICU patients were
on invasive or non invasive
mode of ventilation**

**39% ETI
14% NIV**

20th october 2004

**In the total population of
ventilated patients, 26%
were non-invasively
ventilated**

20th october 2004

Personnel Infirmier et Médical

44 unités, 599 patients :

***350* Infirmières**

20th october 2004

Personnel Infirmier et Médical

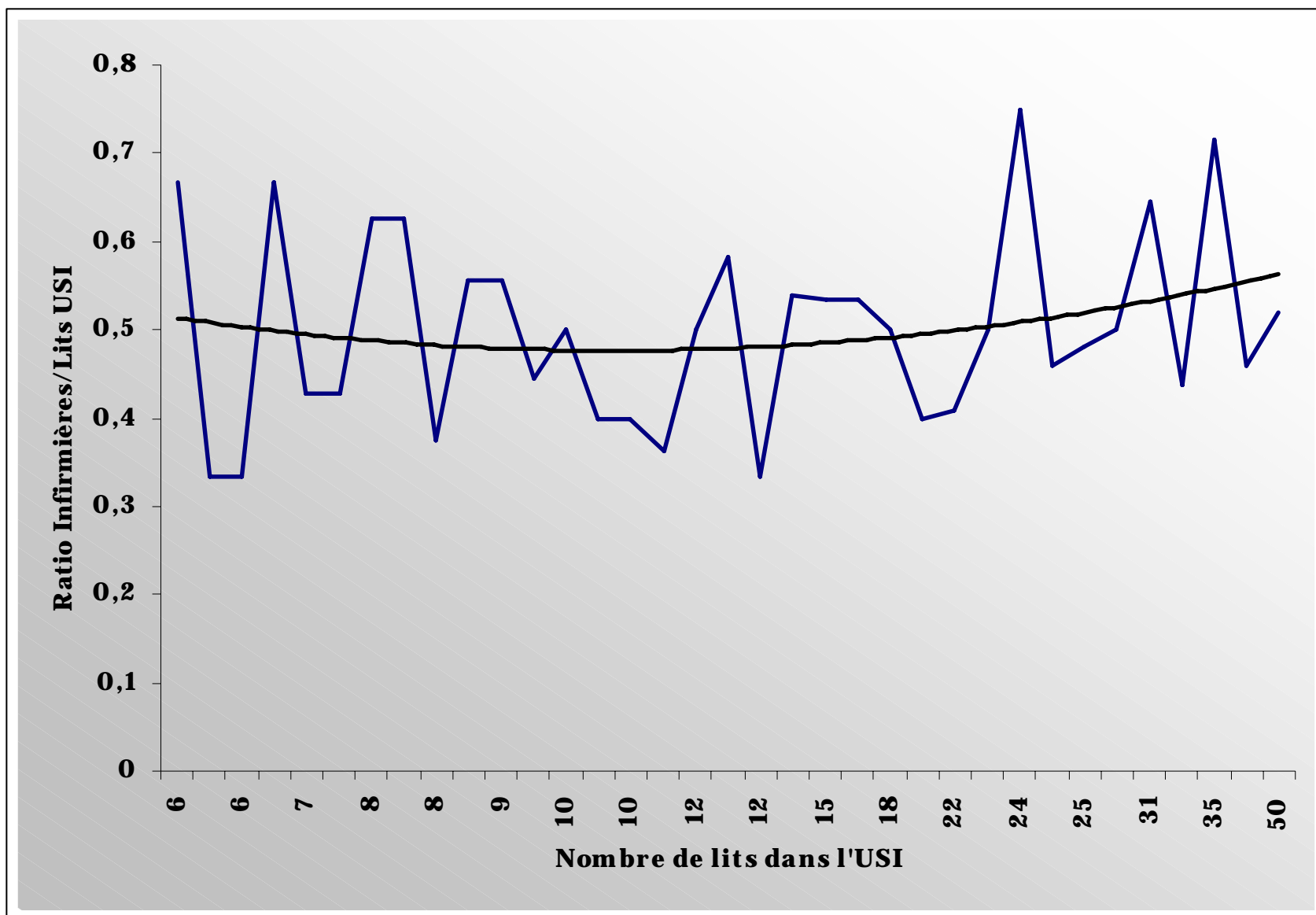
44 unités, 599 patients :

350 Infirmières

Nombre d'Infirmières par lit :

36	ICU
586	beds
300	nurses

moyenne 0,5 +/- 0,11 infirmière / ICU bed



20th october 2004

Nombre d'Infirmière par patient

44 USI, 599 patients, 350 infirmières

Moyenne 0,62 +/- 0,20 infirmière / patient (0,3-1,33)

Médiane 0,58 infirmière/patient

20th october 2004

Patient Survey of ICU

20th october 2004

Questionnaire « *par patient* »

45 ICU

61 NIV patients in **27** ICU

63,7 +/- 12,5 years old, 41 men

Questionnaire « *par patient* »

45 ICU

61 NIV patients in **27** ICU
63,7 +/- 12,5 years old, 41 men

Donc, sur **45** USI

18 n'avaient aucun patient sous VNI

27 avaient au moins un patient sous VNI

Questionnaire « *par patient* »

45 ICU

61 NIV patients in **27** ICU
63,7 +/- 12,5 years old, 41 men

Donc, sur **45** USI

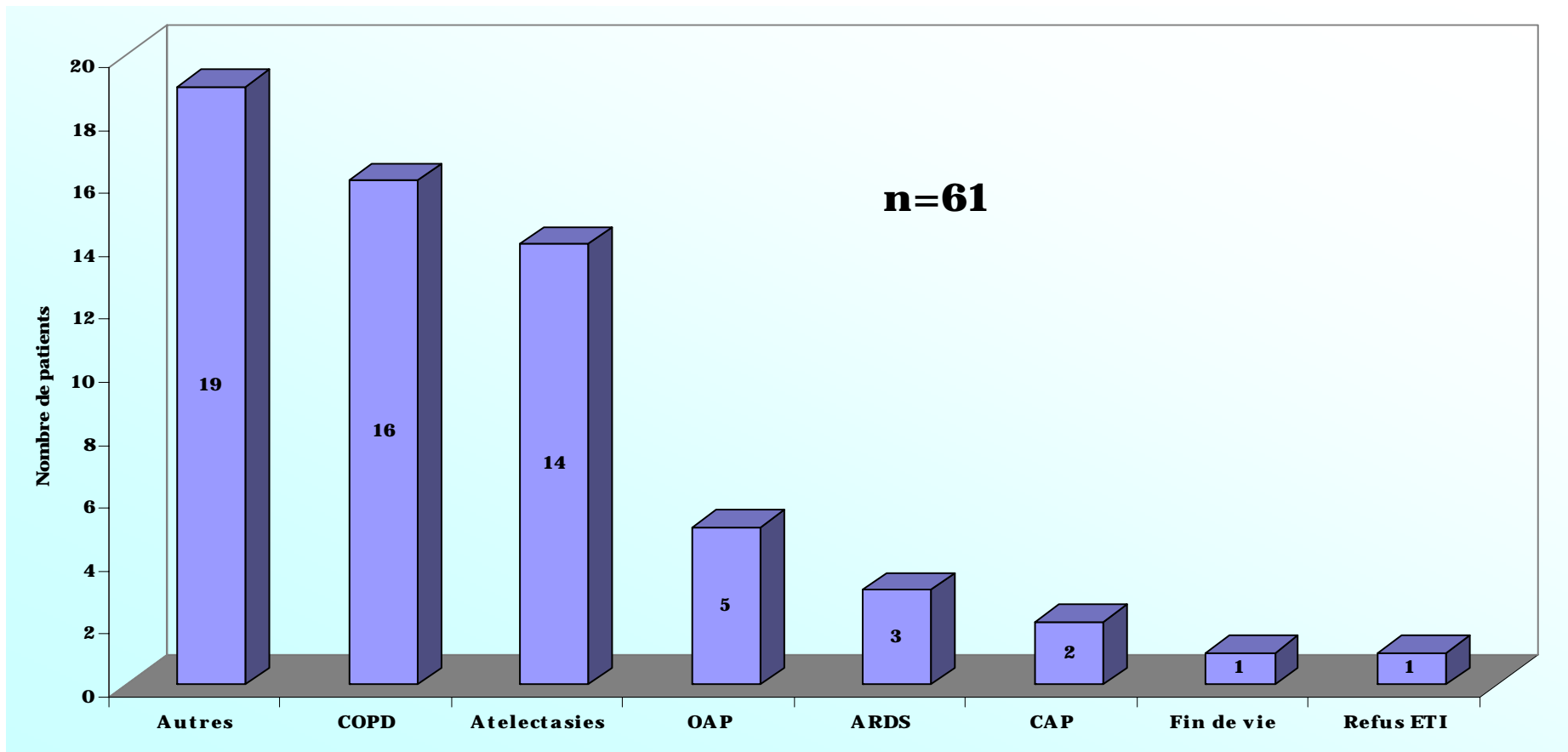
18 n'avaient aucun patient sous VNI

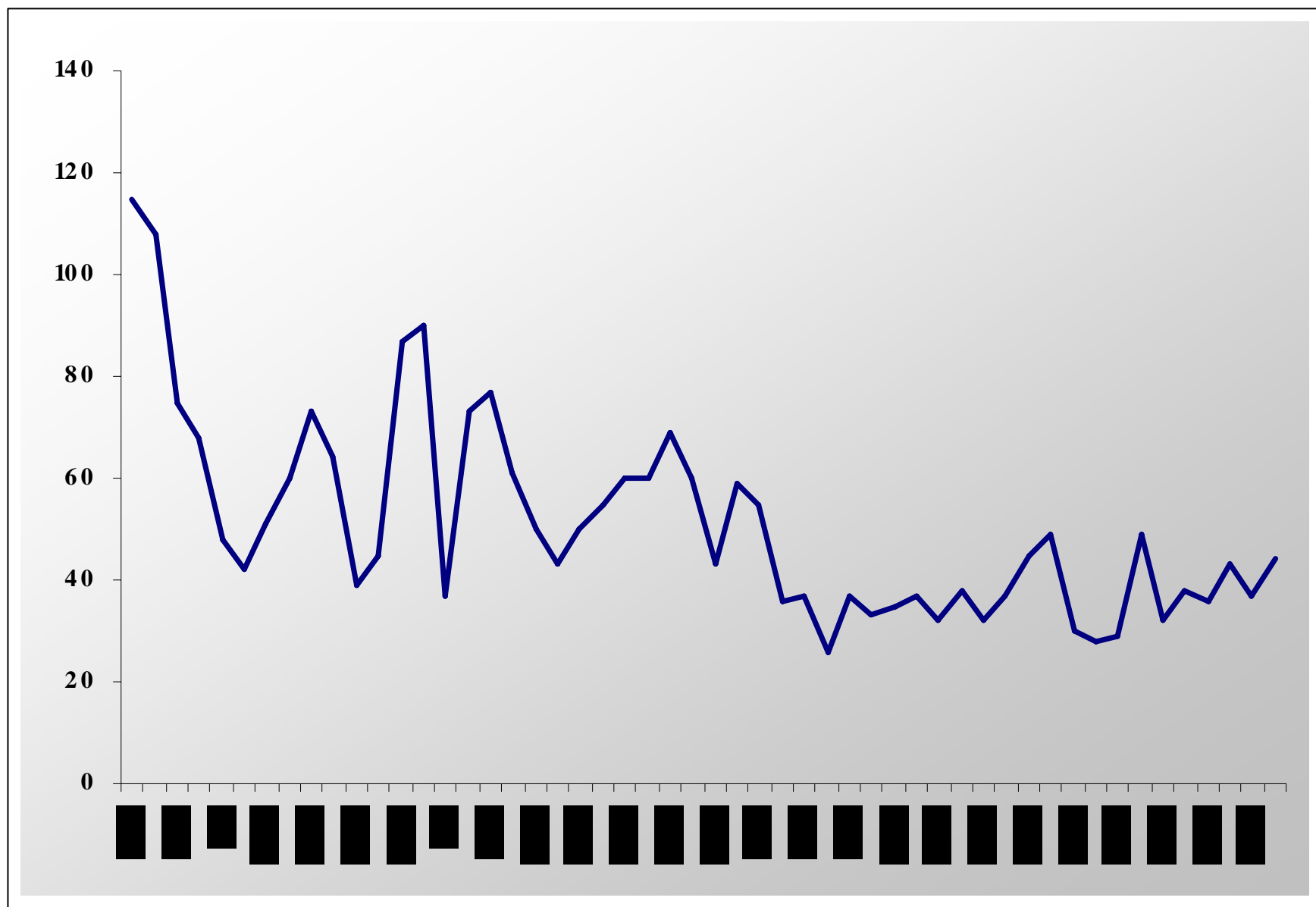
27 avaient au moins un patient sous VNI

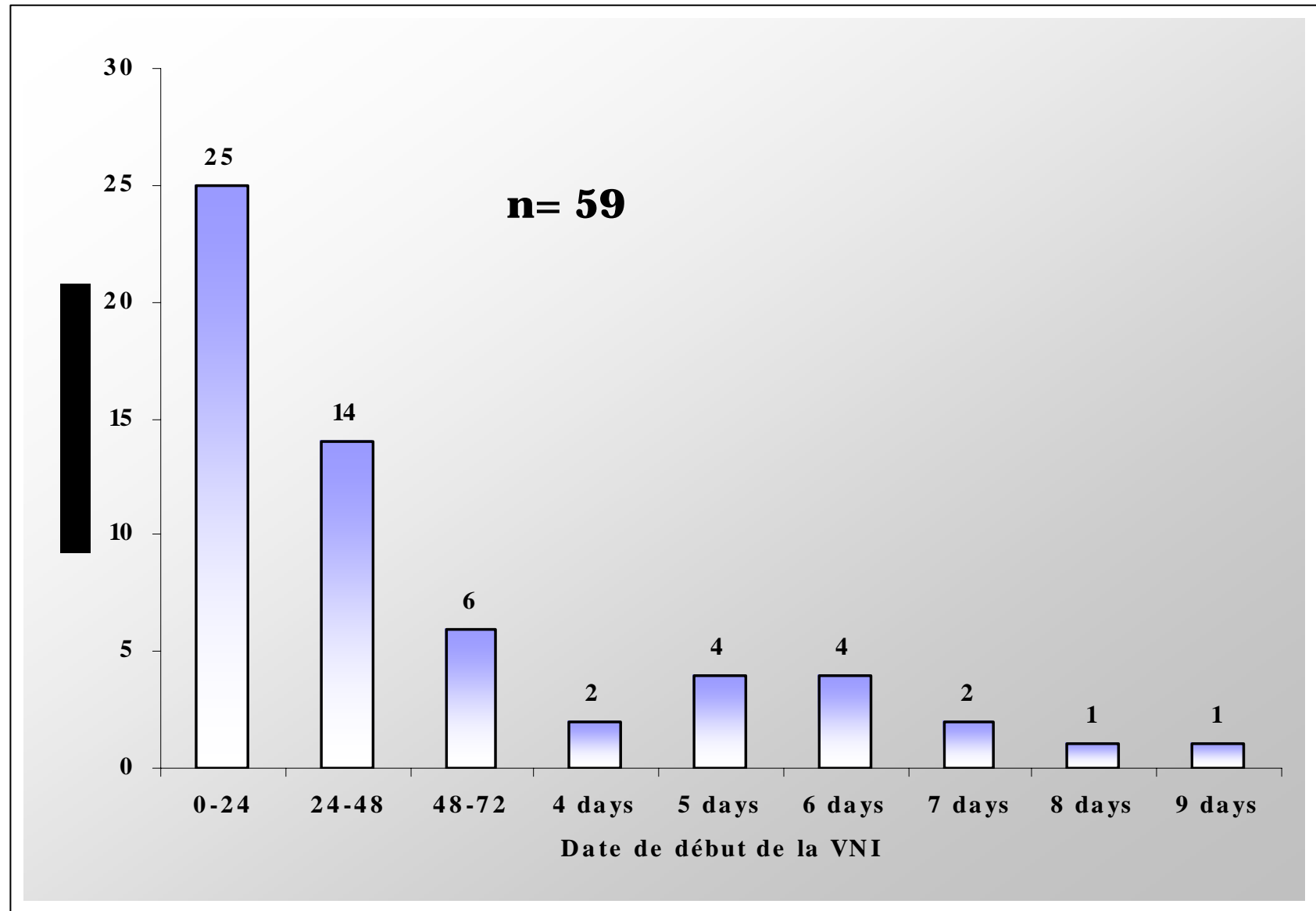
Moyenne générale **1,42 +/- 1,88 patient sous VNI par USI** (0 à 10)

Moyenne dans les USI ayant au moins un patient VNI **2,25 +/- 1,93** (1-10)

Indications de la VNI (20 octobre 2005)







20th october 2004

VNI patients

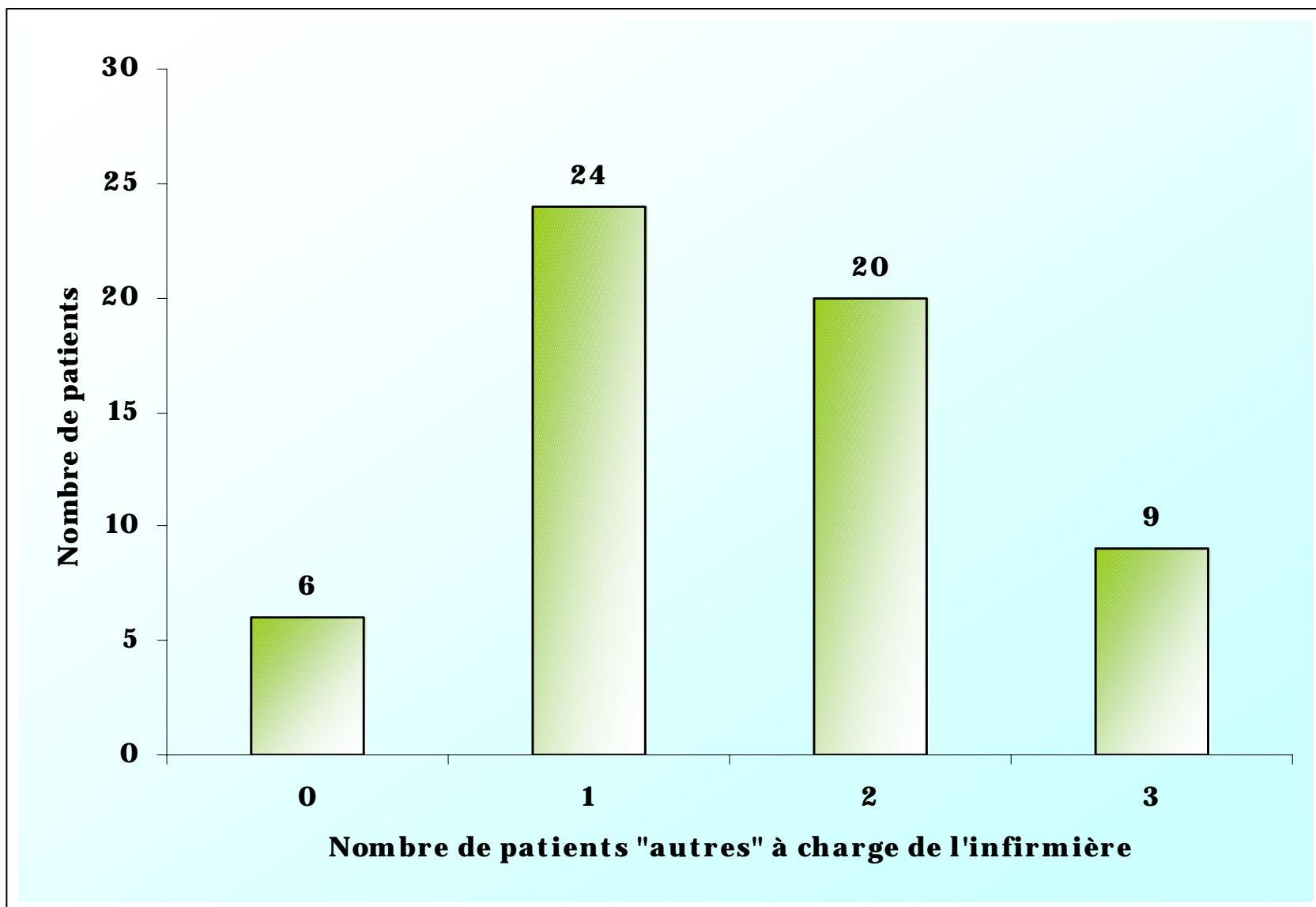
30% were on VNI for more than 48 hours

Scheduled NIV sessions 20th october

N = 50

Number	range	2-8
	mean	4,8 +/- 1,8
	median	4
Duration	mean	73,5 +/- 47,7 min
	median	60 minutes

La VNI est « *continue* »
pour
11 patients sur 61.



Nurse/NIV patient ratio

10% **1 / 1**

40% **1 / 2**

34% **1 / 3**

15% **1 / 4**

Première séance de VNI. Total de 60 patients.

Intervenants :

Mean	2,06 + / - 0,8
Range	0-3
Médiane	2

Première séance de VNI.
Total de 60 patients.
Intervenants : Médiane = 2

1ère séance de VNI				
% implication			Médianes	
Infirmière	72%			15 minutes
Kiné	83%			15 minutes
Médecin	60%			15 minutes

Première séance de VNI.
Total de 60 patients.
Intervenants : Médiane = 2

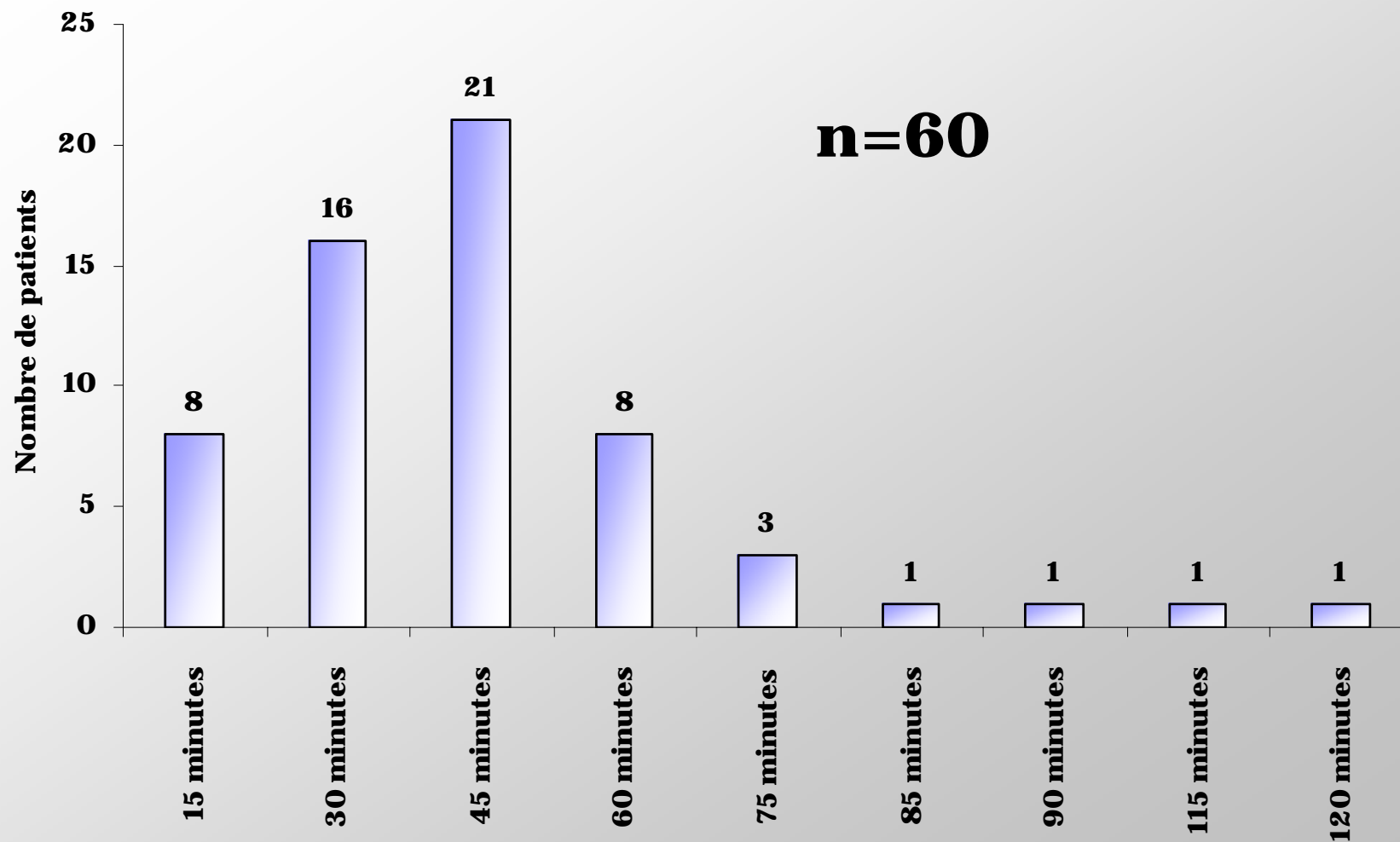
1ère séance de VNI			
% implication			Médianes
Infirmière	72%		15 minutes
		seule	23%
		avec doc	14%
		avec kiné	0%
		avec kiné et doc	62%
Kiné	83%		15 minutes
Médecin	60%		15 minutes

Première séance de VNI.
Total de 60 patients.
Intervenants : Médiane = 2

1ère séance de VNI				
% implication			Médianes	
Infirmière	72%			15 minutes
		seule	23%	
		avec doc	14%	
		avec kiné	0%	
		avec kiné et doc	62%	
Kiné	83%			15 minutes
		seul	44%	
		avec infirmière	12%	
		avec doc	4%	
		avec inf et doc	40%	
Médecin	60%			15 minutes

Première séance de VNI .
Total de 60 patients.
Intervenants : Médiane = 2

1ère séance de VNI				
% implication			Médianes	
Infirmière	72%			15 minutes
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		avec doc	14%	
		avec kiné	0%	
		avec kiné et doc	62%	
Kiné	83%			15 minutes
		seul	44%	
		avec infirmière	12%	
		avec doc	4%	
		avec inf et doc	40%	
Médecin	60%			15 minutes
		seul	0%	
		avec infirmière	36%	
		avec kiné	6%	
		avec inf et kiné	58%	

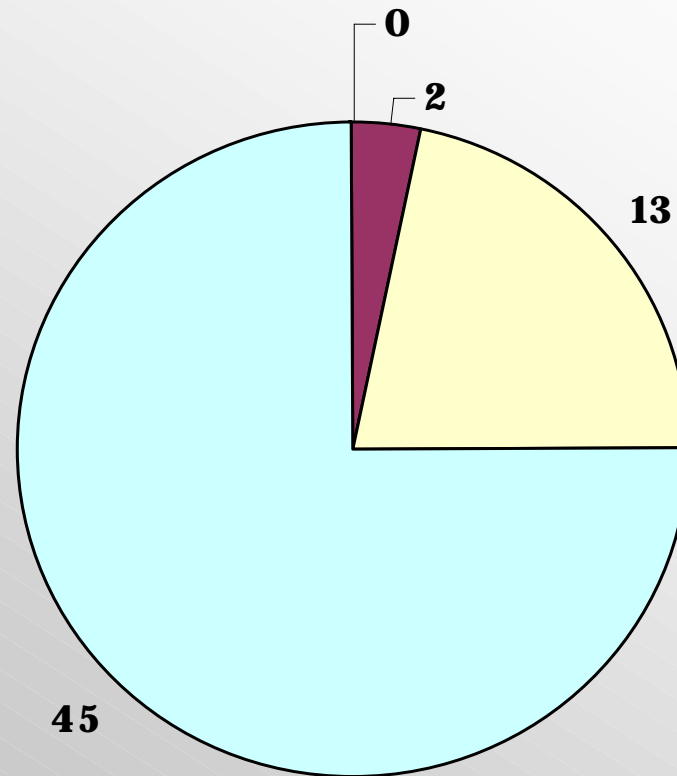
Temps total consacré à la première séance

First NIV session duration

15 minutes	15%
30 minutes	25%
45 minutes	35%
60 minutes	15%
> 60 minutes	15%

Séance de VNI du 20 octobre

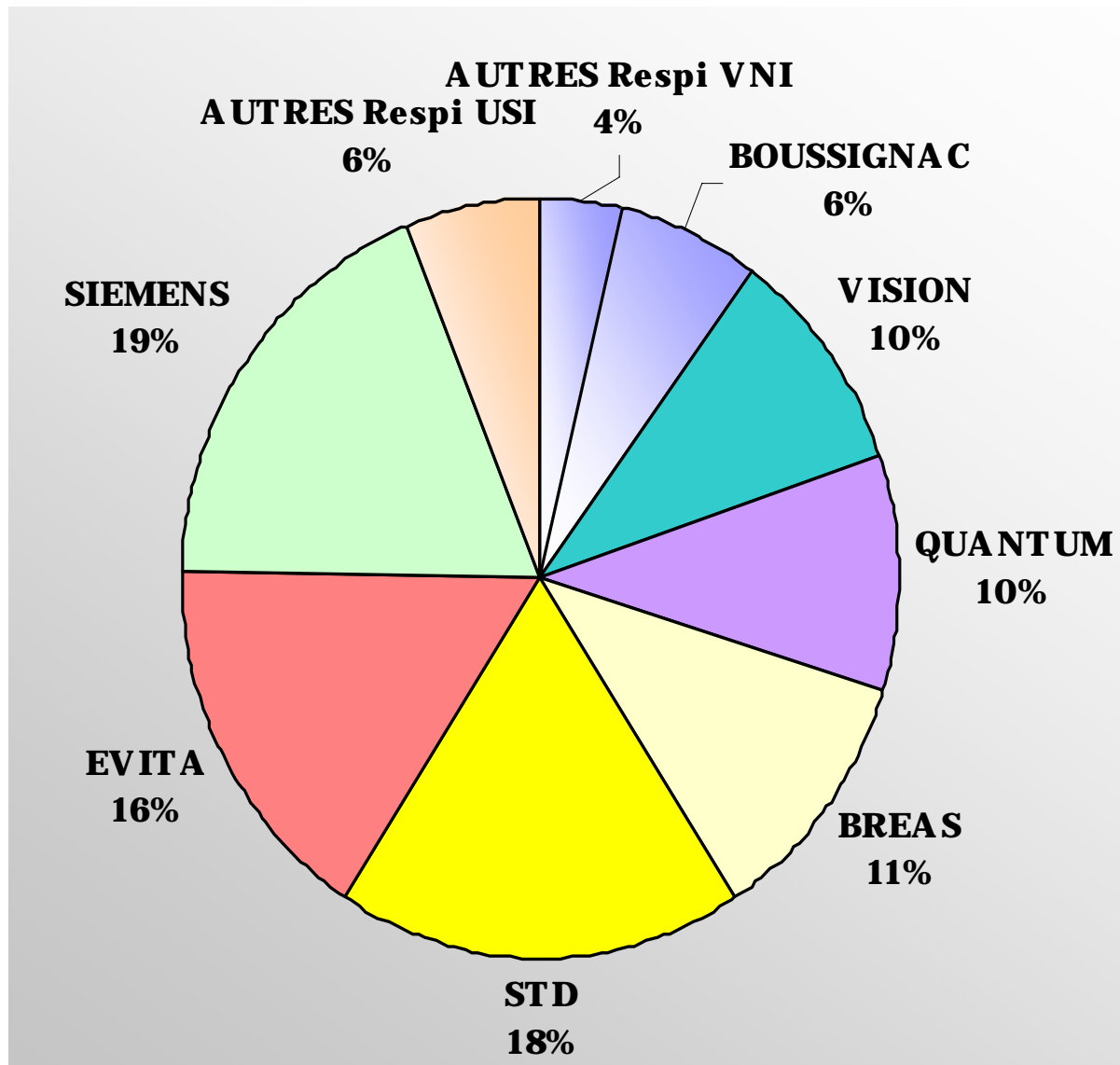
% implication		Médianes	
Infirmière	74%	15 minutes	
		seule	18%
		avec doc	11%
		avec kiné	25%
		avec kiné et doc	45%
Kiné	88%	15 minutes	
		seul	30%
		avec infirmière	24%
		avec doc	2%
		avec inf et doc	43%
Médecin	45%	15 minutes	
		seul	0%
		avec infirmière	20%
		avec kiné	3%
		avec inf et kiné	77%



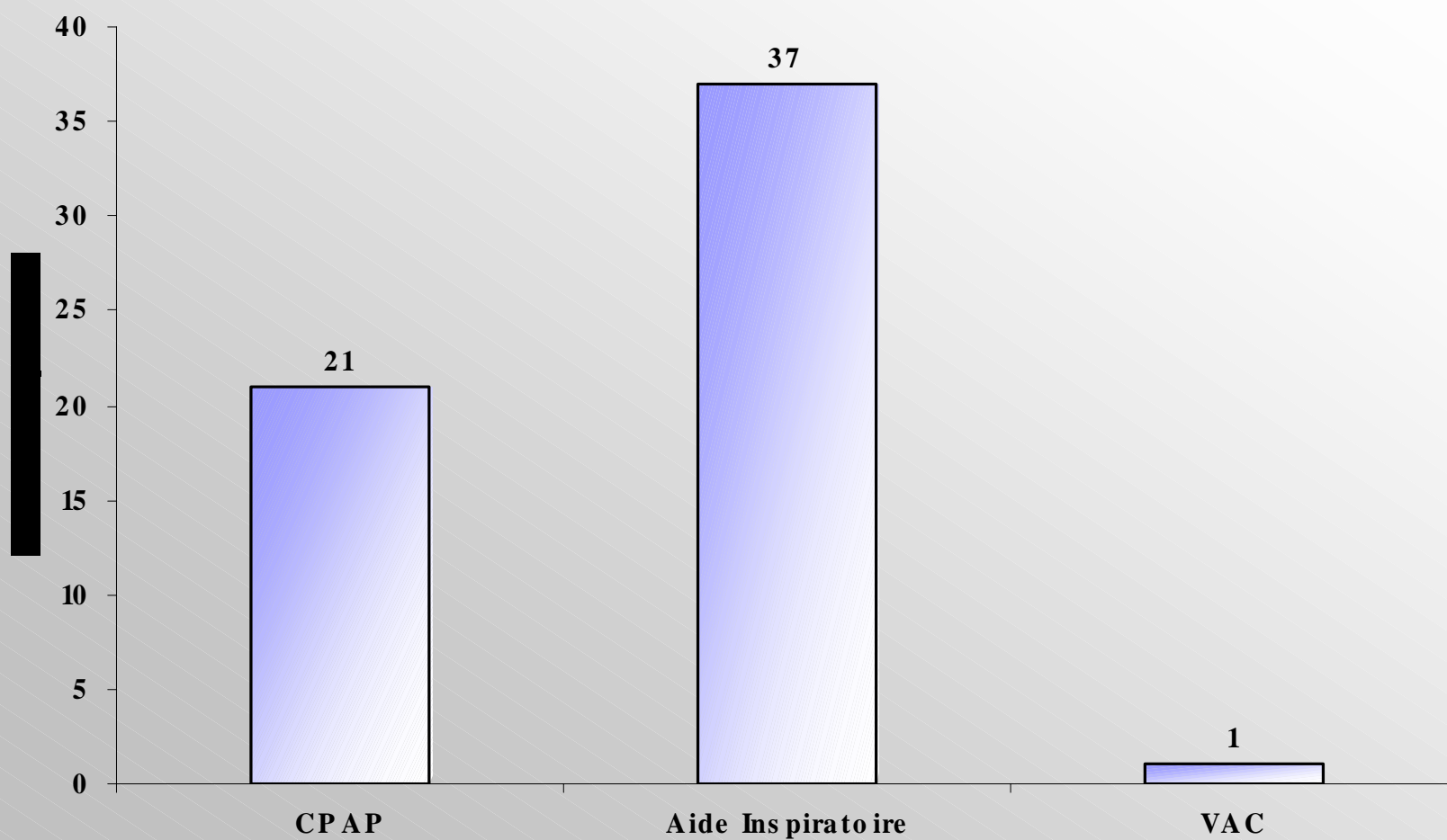
■ Nasal ■ Helmet ■ Full Face ■ Oronasal

Respirators

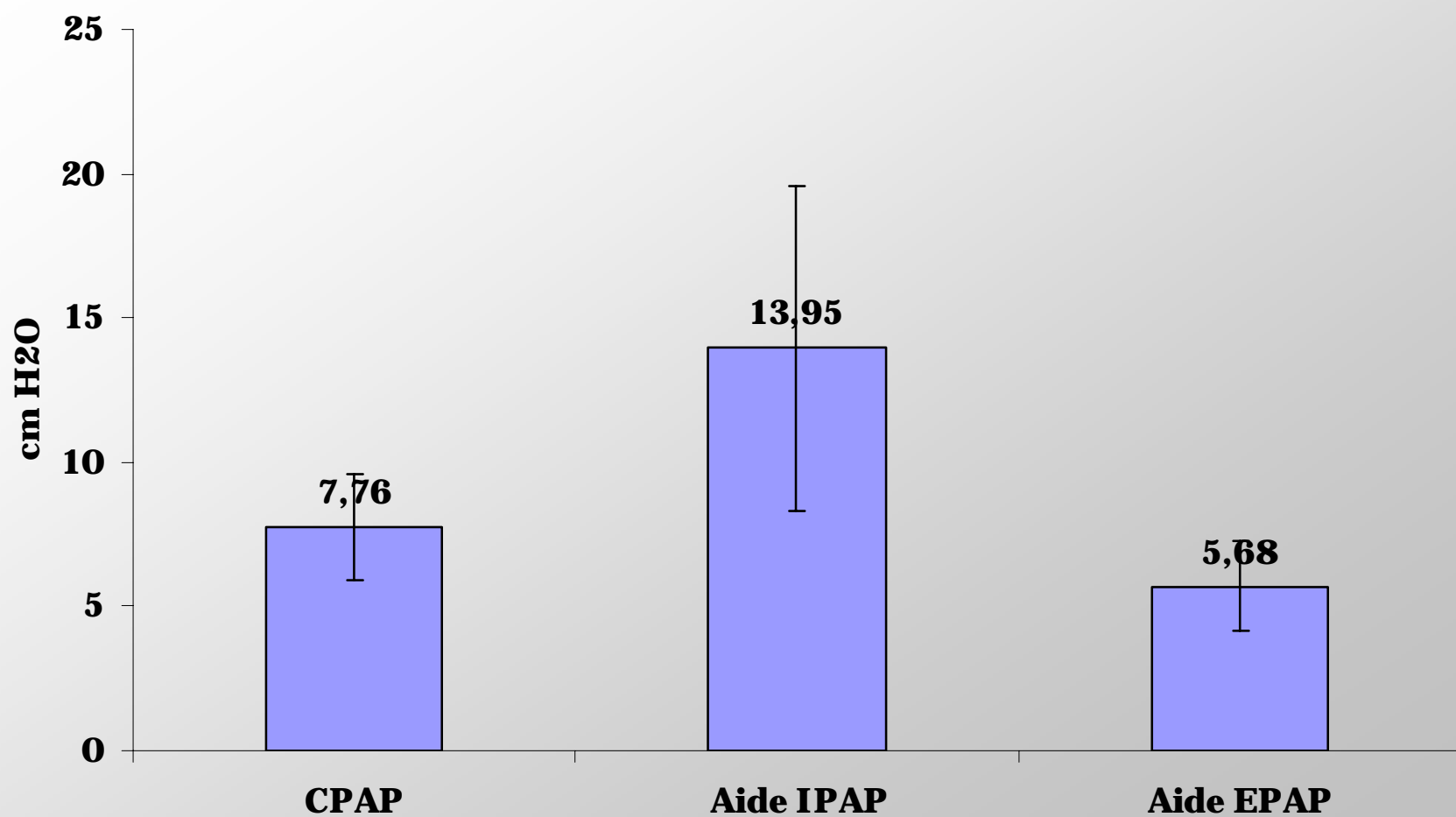
41%	ICU ventilators
59%	NIV ventilators



Mode Ventilatoire en VNI



Niveaux de pressions en VNI

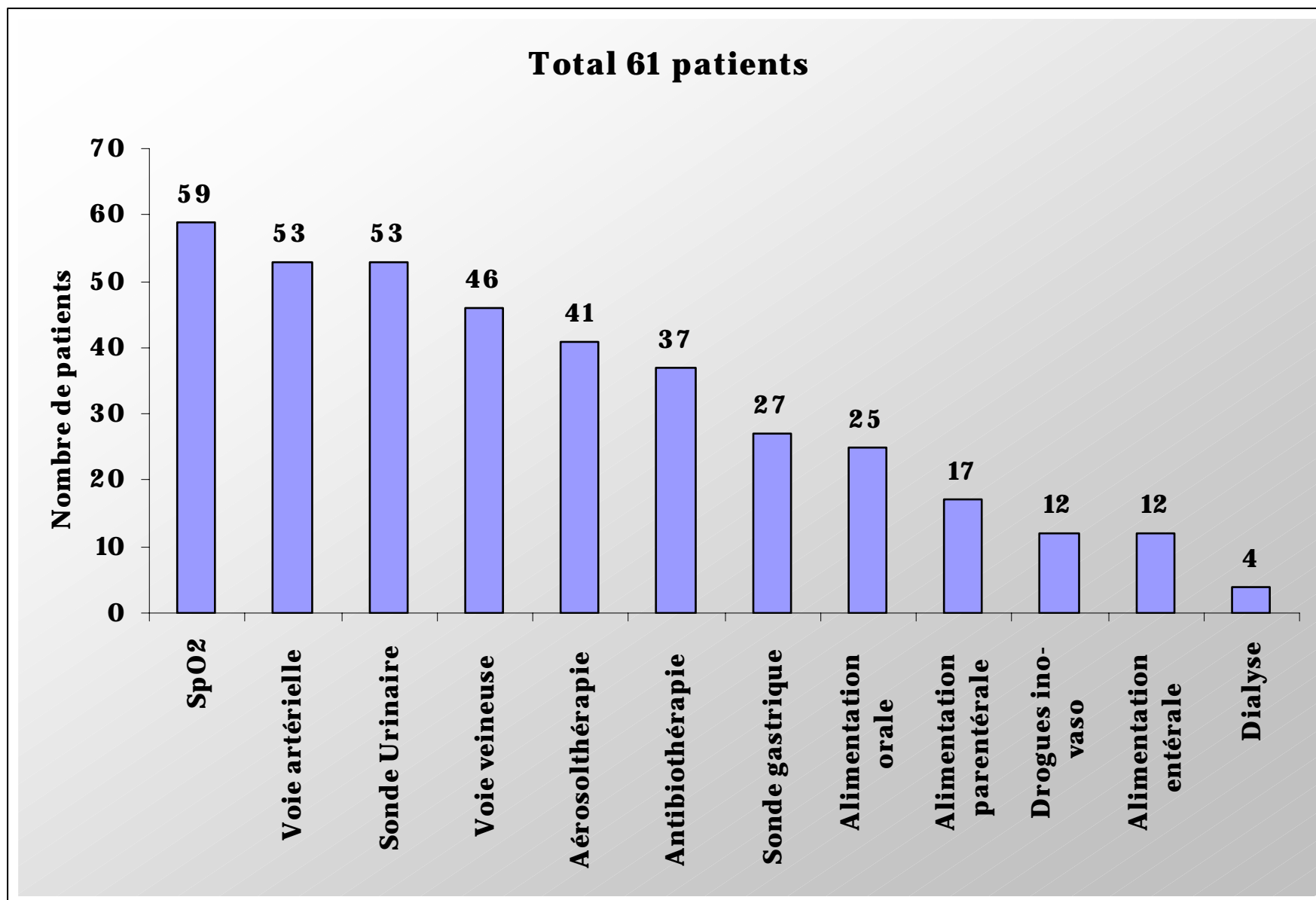


Humidification des gaz respiratoires.

25 patients sur 61.

Oxygène supplémentaire

56 patients sur 61



Conclusion: **Questionnaire général**

42 réponses sur 140 questionnaires

726 lits,

70 admissions/bed/year

1 USI respirator / bed

1 NIV respirator / 6 beds

ICU is relatively often the unique ward applying VNI

Stratégie VNI

- masque naso-buccal, PSV with oxygen
- humidification absente dans 25% des NIV patients
- Le problème = Intolérance

Conclusion: **20th october 2004**

45 ICU, 599 patients

27 ICU with NIV patient(s)

1 NIV/ICU

26% of ventilated patient were on NIV

0,5 nurse /bed, 0,6 nurse/patient

For NIV patients: 0.5 to 0.33 nurse/NIV patient

4 sessions 60 minutes/day (20% are continuous)

2 persons/session

15 minutes/ person

Conclusion

Variability of NIV use

(0 to 10 patients per ICU)

(0 to 0,65 specific ventilator/bed)

Monitoring

(ECG, SpO₂, Gas, arterial pressure)

Invasivity

(arterial, central venous, urinary catheters)

Large panel of indication

(difficult weaning, post-extubation)

Long duration of NIV

(30% for more than 48 hours)

Conclusion

This evaluation is too static

Project:

! a more dynamical and comparative evaluation !

! economical evaluation !

! Improvement "adherence" level !