Device inalatori nella BPCO:

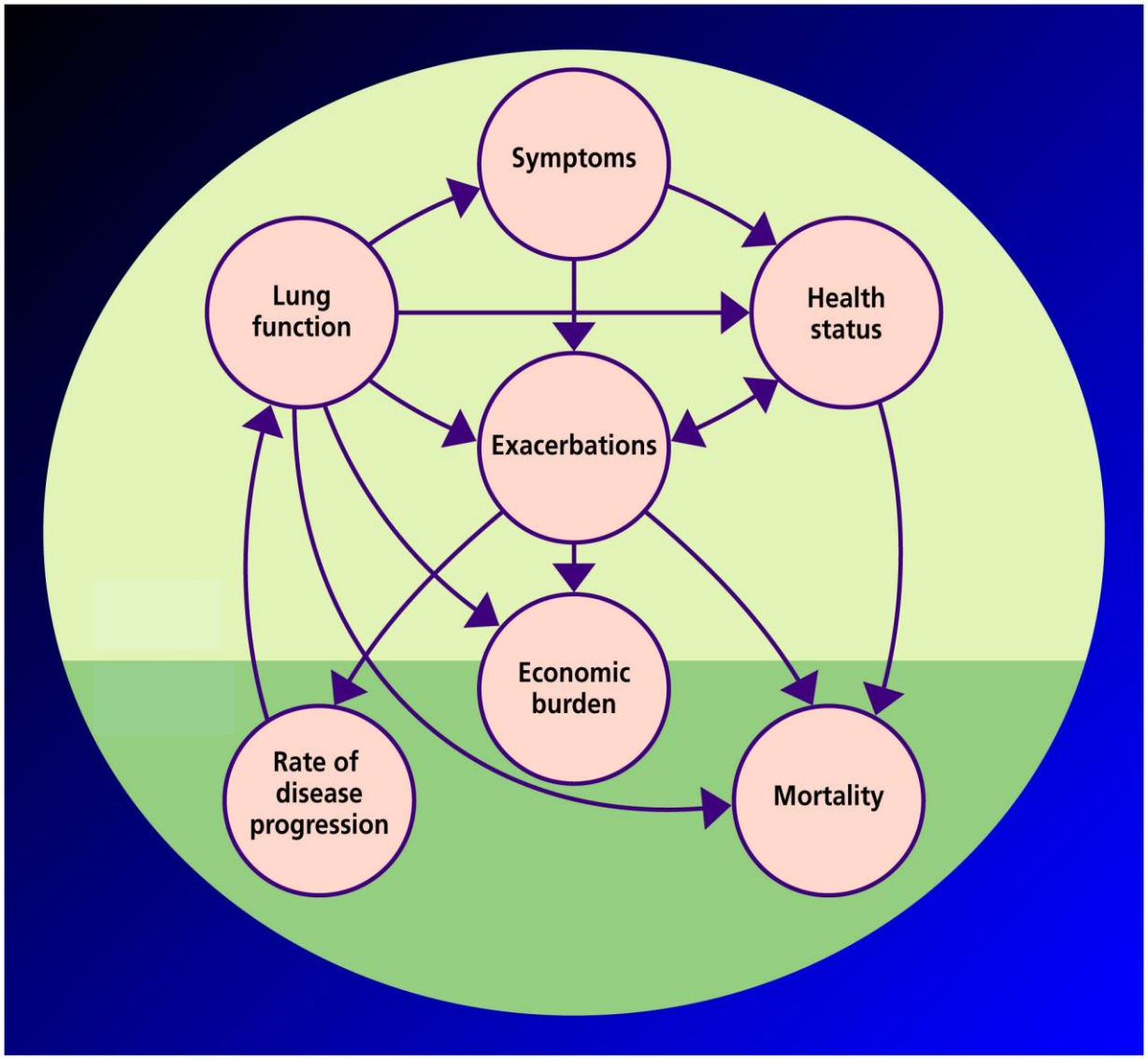
d'uso, counseling, aderenza alla terapia

Fulvio Braido

Azienda Ospedaliera Universitaria San Martino

Università degli Studi di Genova

COPD OUTCOMES



Cazzola M et al. ERJ 2008

THORAX

Adherence to inhaled therapy, mortality and hospital admission in COPD

J Vestbo, J A Anderson, P M A Calverley, et al.

Thorax 2009 64: 939-943 originally published online August 23, 2009

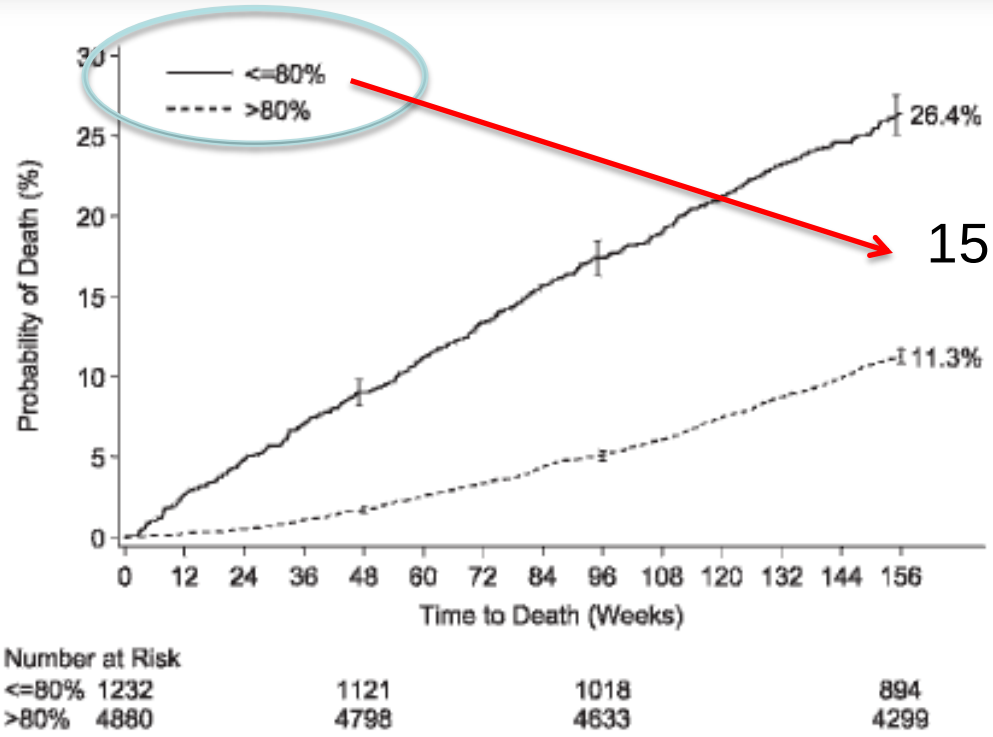
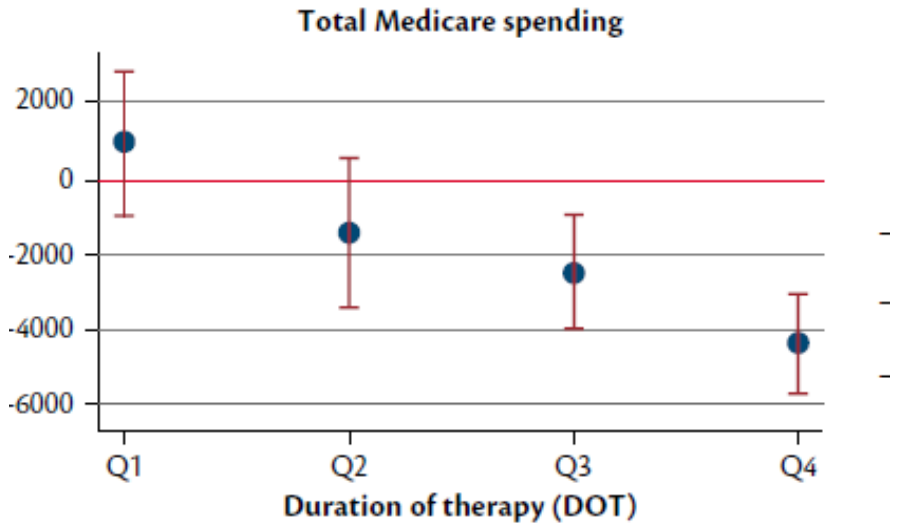


Figure 1 Kaplan–Meier plot of survival in patients adherent to study treatment and patients not adherent.

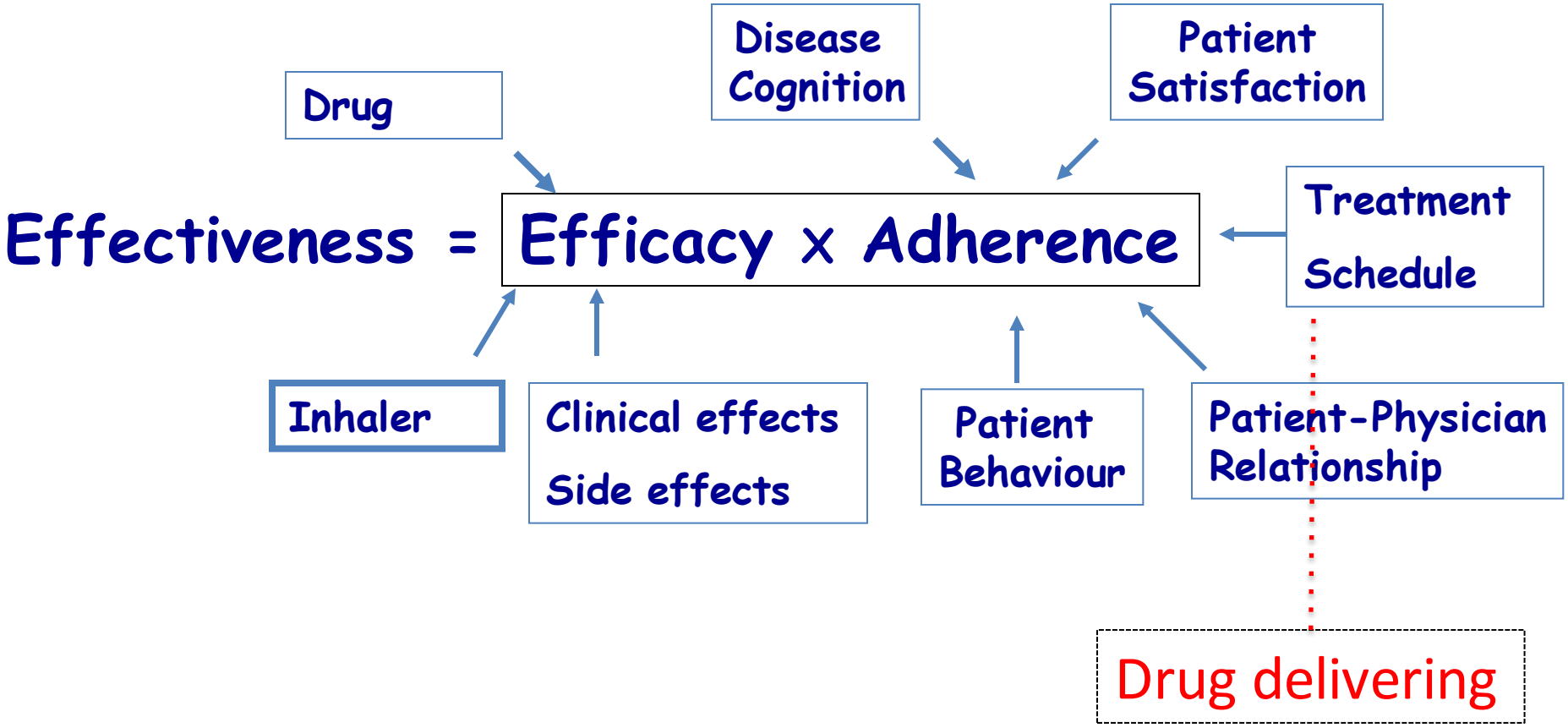
Total medicare spending



Simoni-Wastila,
Am J Geriatr Pharmacother, 2012

Efficacia: outcomes effettivamente raggiunti / outcomes attesi

Efficienza : rapporto output – input


Drug
Disease Cognition
Patient Satisfaction
Effectiveness = Efficacy x Adherence
Treatment Schedule
Inhaler
Clinical effects
Side effects
Patient Behaviour
Patient-Physician Relationship
Drug delivering

The tough math of evidence based health care:

ROI = E x KT2

- **ROI = return on investment.**
- **E = efficacy of treatment.**
- **KT2*:**
  - **Physician**
  - **Patient**

*knowledge translation type 2

Haynes, ACP Journal Club 2009

The tough math of evidence based health care: asthma and ICS.

- 25% therapeutic efficacy.
- 37% for patient adherence.
- 78% Physician adherence.

.25 x .37 x .78 = .0725

7.5% the overall effectiveness

Haynes ACP, Journal Club 2009

Braido *et al. Respiratory Research* 2013, **14**:94
http://respiratory-research.com/content/14/1/94

RESPIRATORY RESEARCH

RESEARCH Open Access

Obstructive lung diseases and inhaler treatment: results from a national public pragmatic survey

Fulvio Braido[1*], Ilaria Baiardini[1], Massimo Sumberesi[2], Francesco Blasi[3] and Giorgio Walter Canonica[1]

PAP

Respiratory diseases management

Perception and experience of the disease, adherence and attitudes towards the device

PUBLIC PERCEPTION

Doxa

MARKETING Advice

EXTENSIVE SURVEY

The methodology used

Type of investigation:	ad hoc quantitative
Detection mode:	personal interviews (C.A.P.I. system) 30 minutes' structured questionnaire
Reference population:	men and women aged 15 years and over resident in the whole national territory
Sample:	2.000 interviews representative of the sample according to the main socio-demographic parameters
Survey:	from May 22nd to June 7th, 2012

Doxa MARKETING Advice

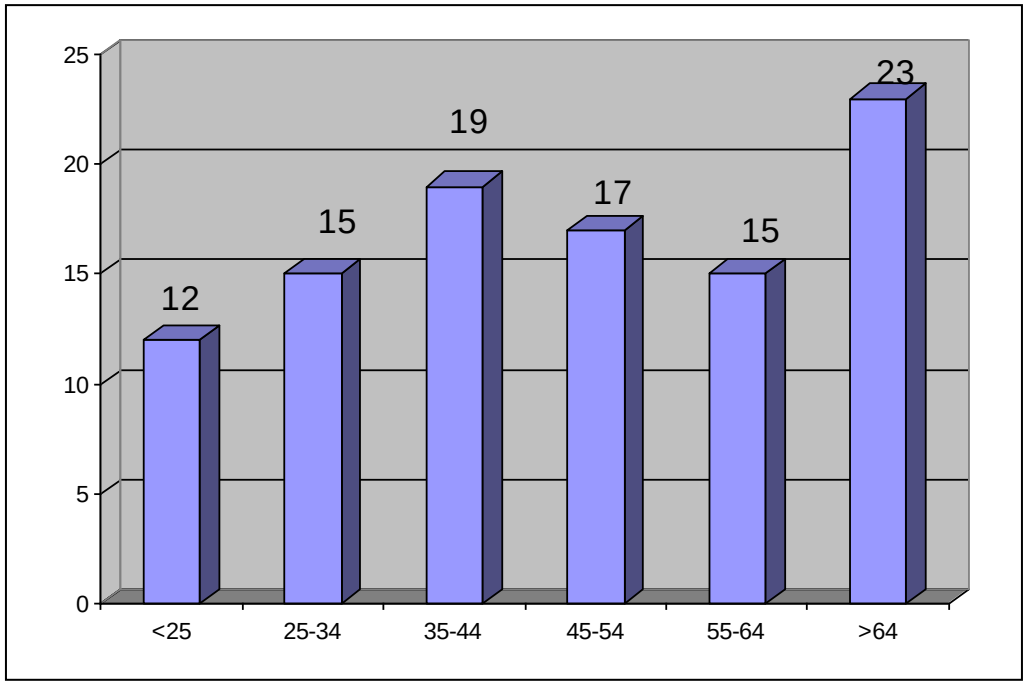
Sample demographic characteristics

N° of patients: 2008

Table 1 Sample demographics

Demographic characteristics		%
Sex	Males	48
	Females	52
Age	< 25 yrs.	12
	25-34 yrs.	15
	35-44 yrs.	19
	45-54 yrs.	17
	55-64	15
	> 64 yrs.	22
Geographic area	Northwest	27
	Northeast	19
	Centre	20
	South and Islands	34
Education	Primary and secondary school	50
	High school	41
	Academic degree	9
Professional condition	Employed	47
	Unemployed	53
Socio-economic condition	Low	2
	Medium-low	13
	Medium	70
	Medium-high	13
	High	2

AGE

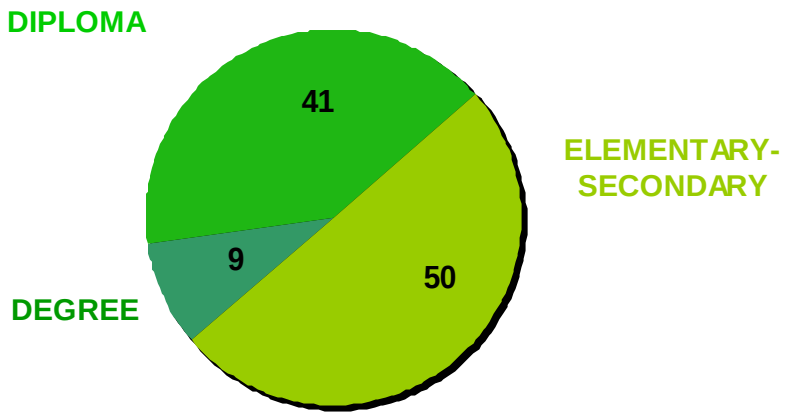


TOWN SIZE

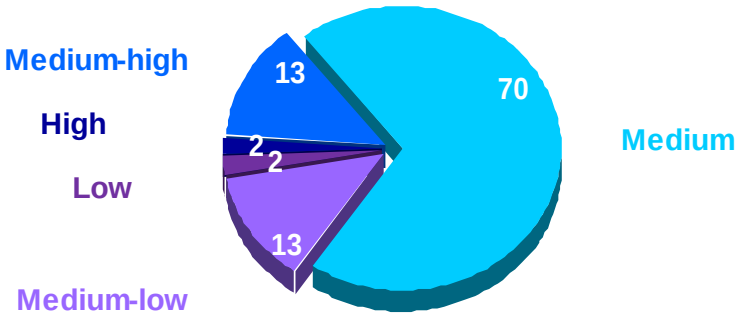
LITTLE < 30.000 inhab.	59
MEDIUM 30-100.000 inhab.	16
BIG > 100.000 inhab.	25

Socio-economic condition

EDUCATION



SOCIO-ECONOMIC CATEGORY

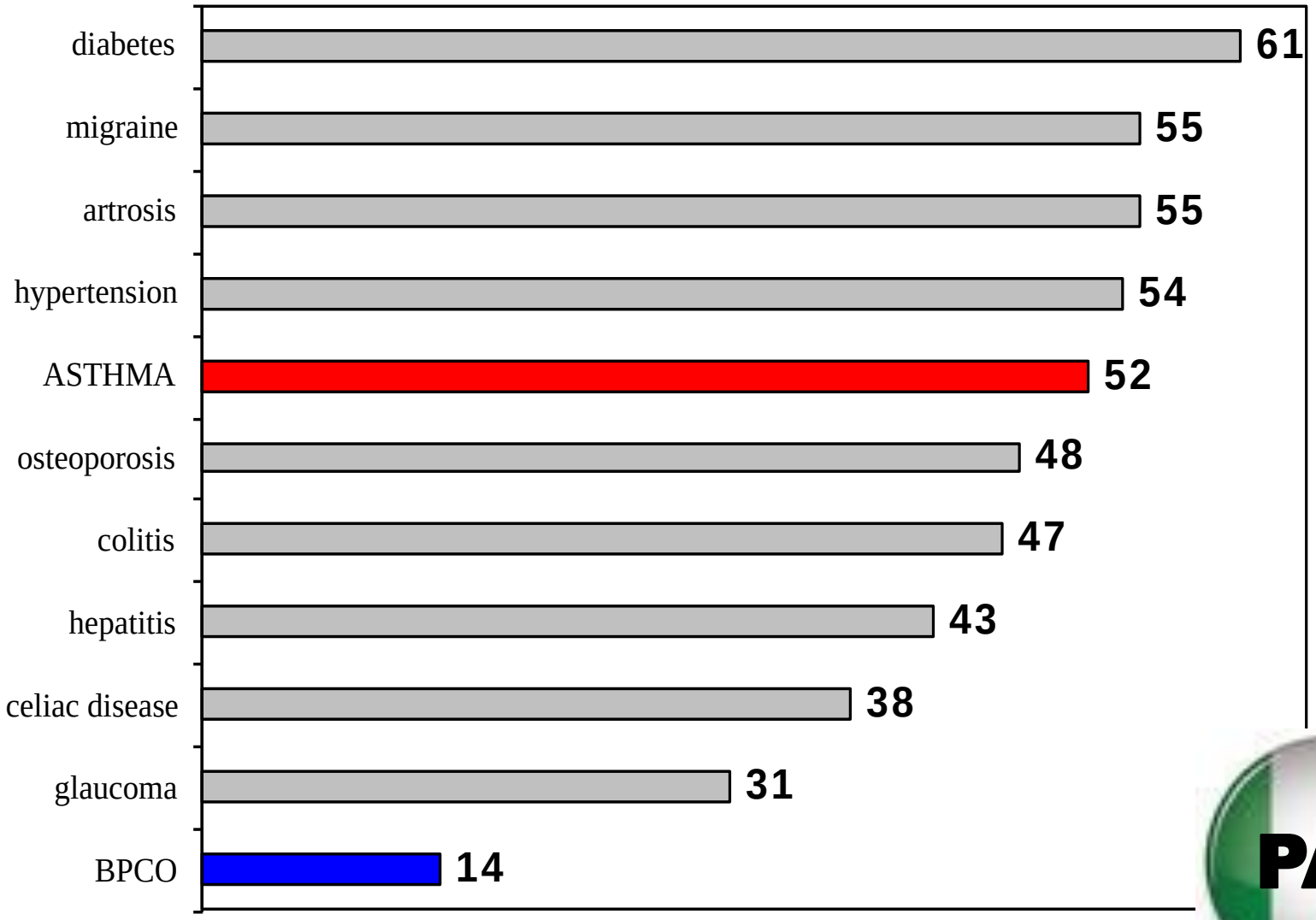


JOB

WORKING	***47***
EMPLOYEE	18
TRADER, CRAFSTMAN	8
TECHNICIAN	6
WORKER	5
ENTREPRENEUR, FREELANCE PROFESSIONAL	5
TEACHER	2
MIDDLE MANAGER	2
EXECUTIVE MANAGER	1
FARMER	1
NOT WORKING	***53***
RETIRED	26
HOUSEWIFE	12
STUDENT	10
UNEMPLOYED	6

N° of patients: 2008

AWARENESS OF RESPIRATORY DISEASES

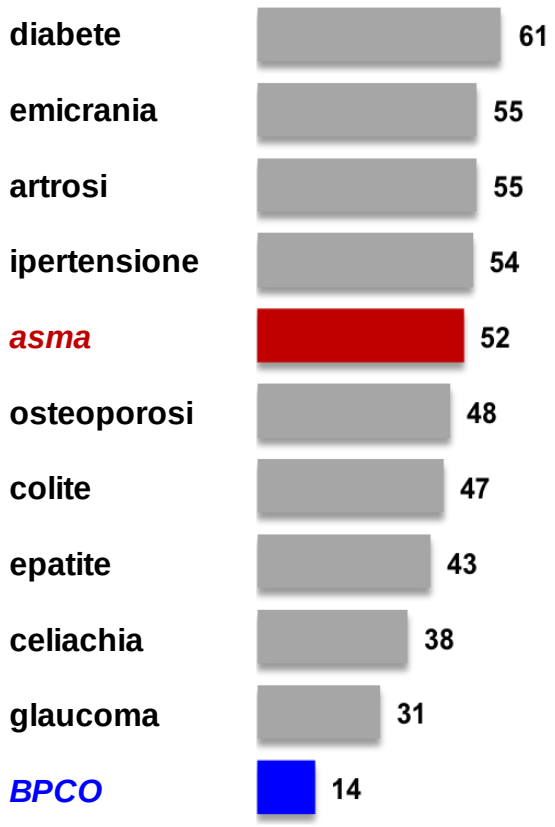


PAP

La conoscenza delle malattie respiratorie

LIVELLO DI AWARENESS

Di recente Le è capitato di sentir parlare di qualcuna delle seguenti malattie?

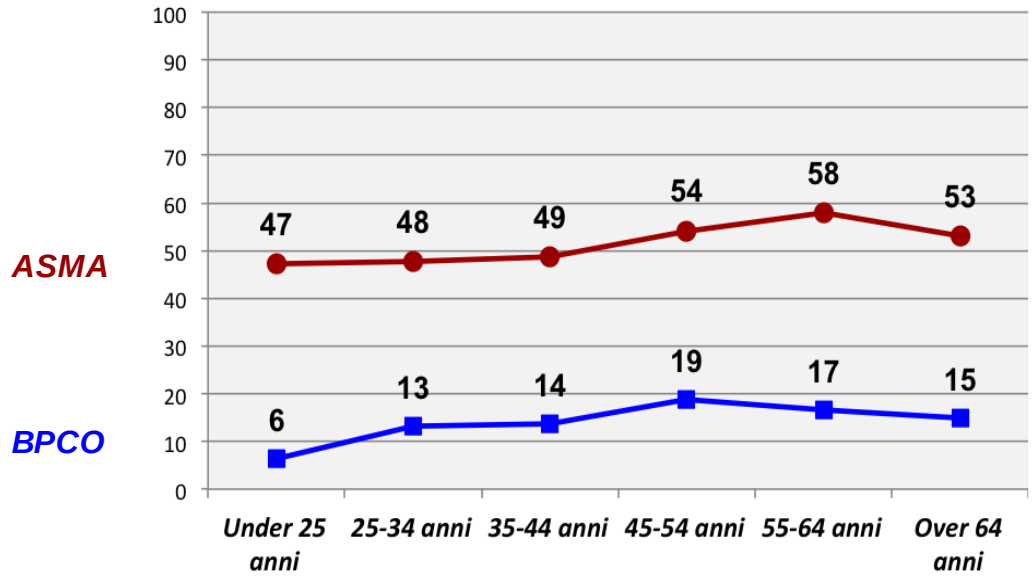


Rispondenti (totale campione): 2.008

%

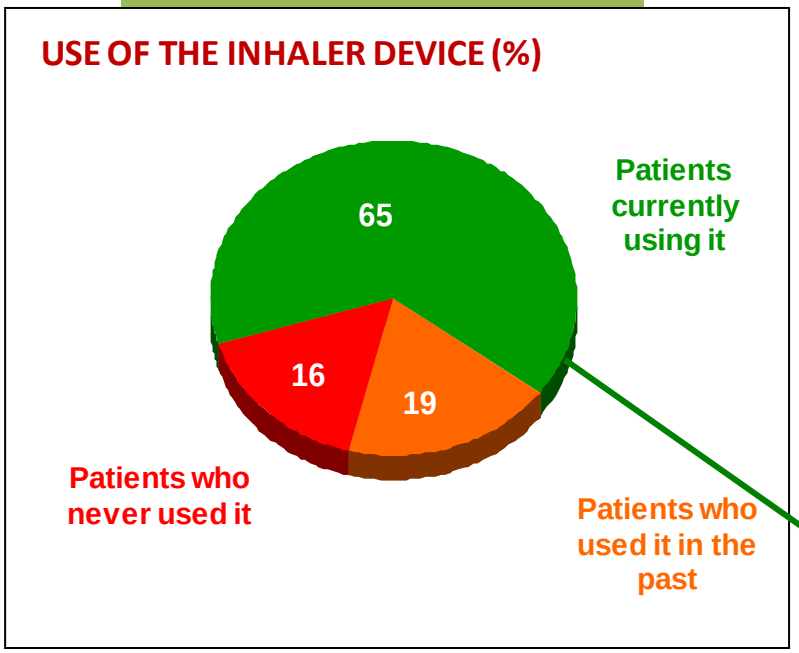
Presso il general public la conoscenza delle malattie respiratorie croniche presenta consistenti discontinuità. Da un lato si è sentito parlare molto di asma, mentre la BPCO rimane un patologia ancora misconosciuta.

Awareness per classi di età



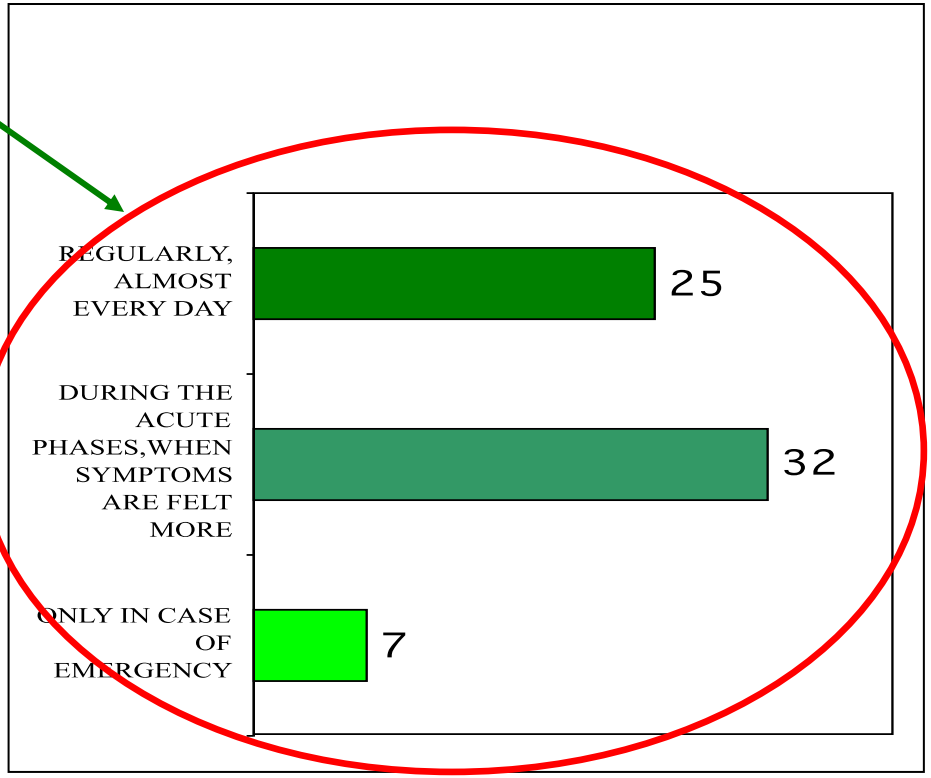
USE OF THE INHALER DEVICE

Respondents: suffer from asthma/COPD



%

The use of device is less extended than we might expect. The percentage of abandoners is significant.



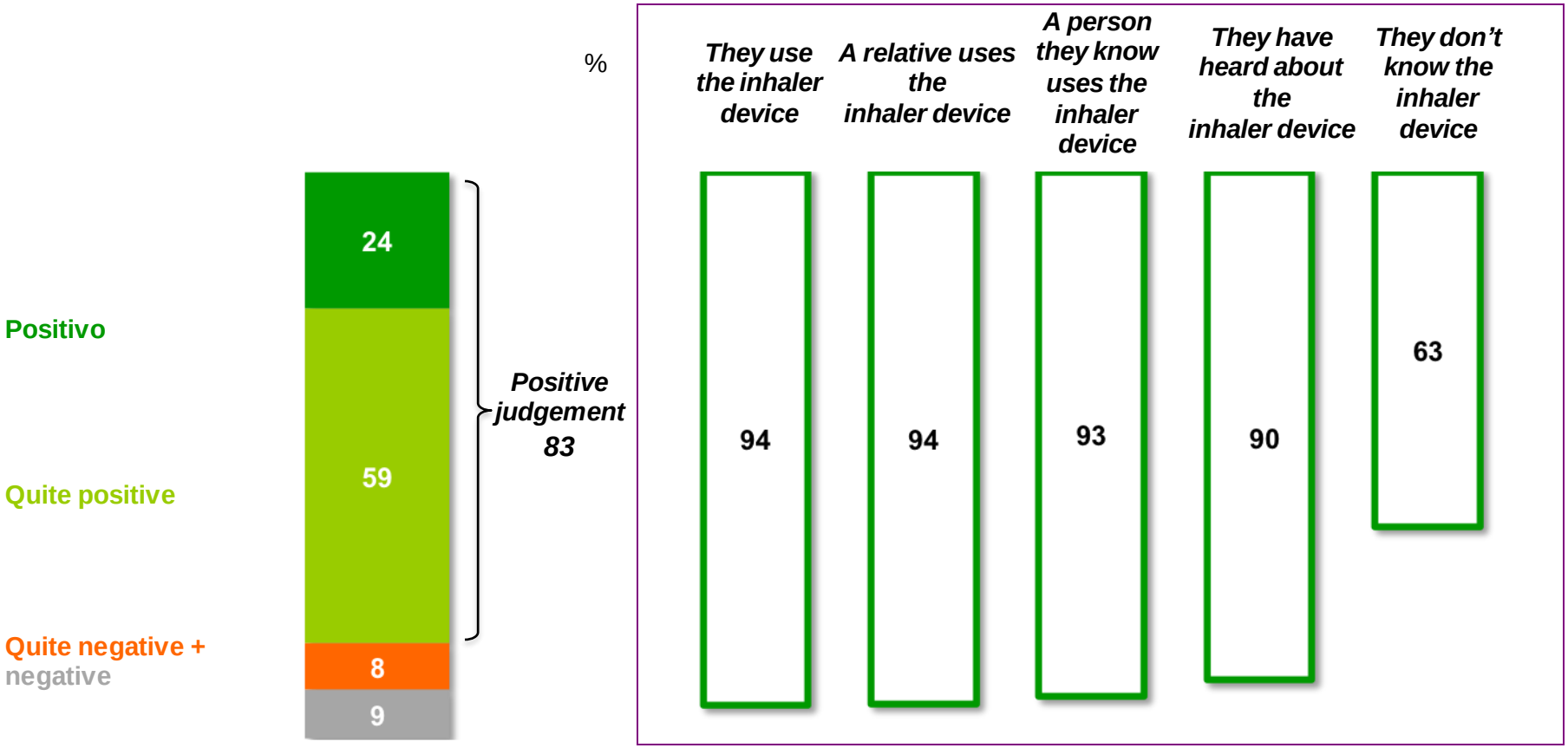
It should be noticed an intermittent use of the device: in most cases it is used as needed.

PAP

Attitudes towards the device

OVERALL OPINION

If you had to give your overall opinion on the treatment with drugs taken by means of an inhaler device, which would be your judgment?

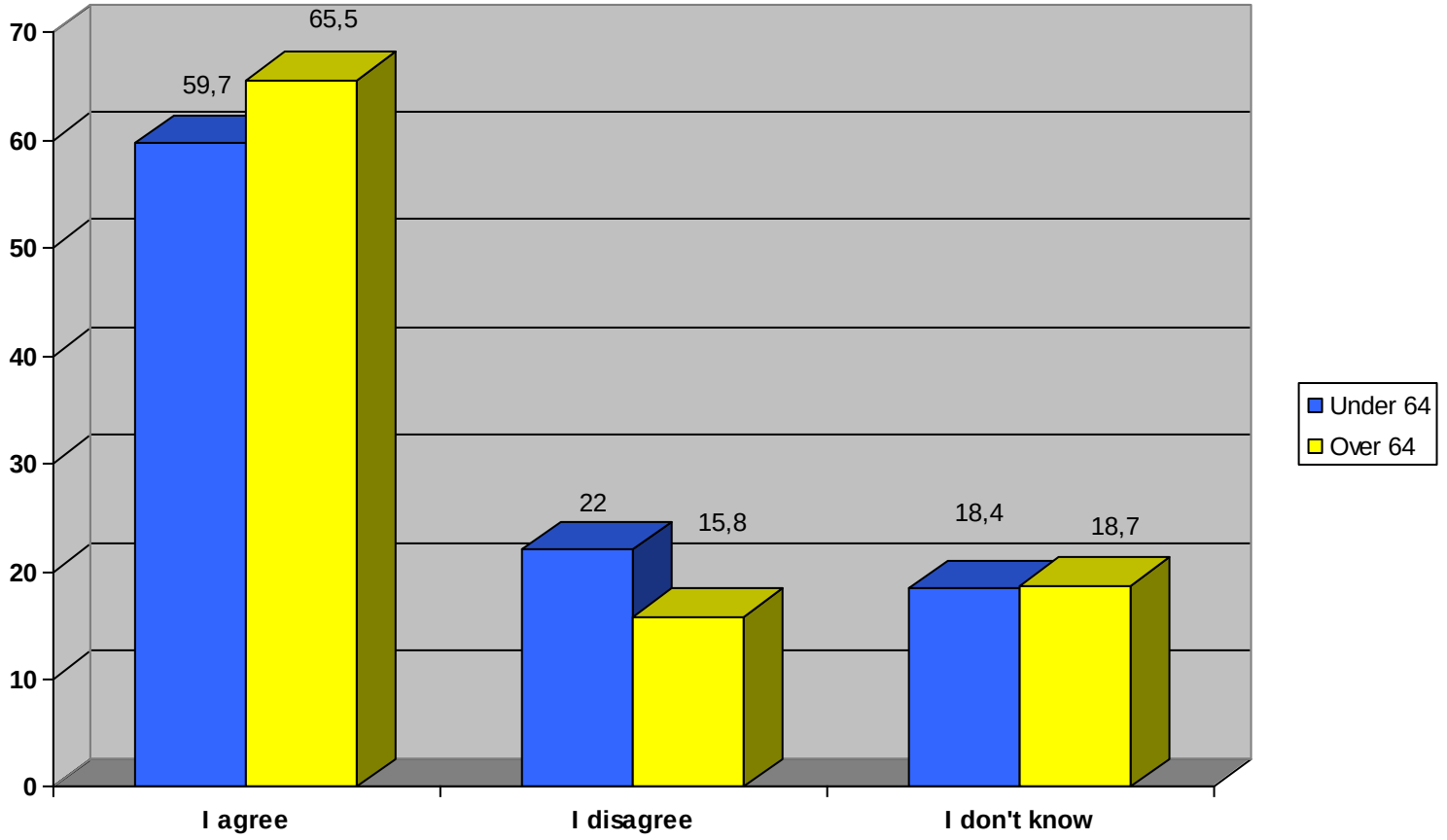


The resistance to the device is limited to people who can not rely on knowledge of the device. Where there is direct or indirect experience, there is an attitude of frank openness.

Respondents: total sample

I believe that all device are more or less the same, that one is as good as another

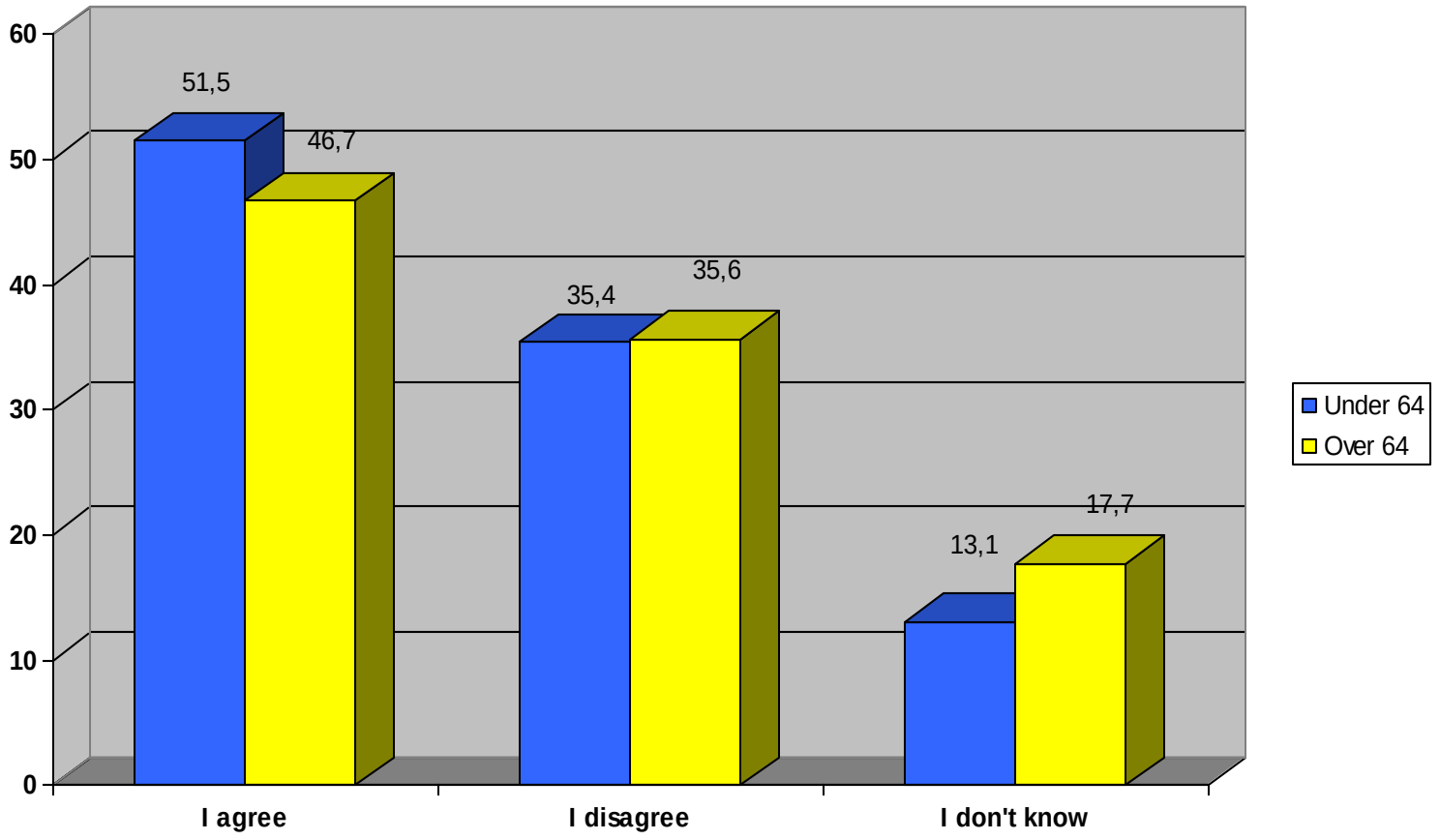
INDIFFERENCE



χ^2 =8.6865 **p<0.0130**

The device is just a device, it does not contribute to the effectiveness of treatment

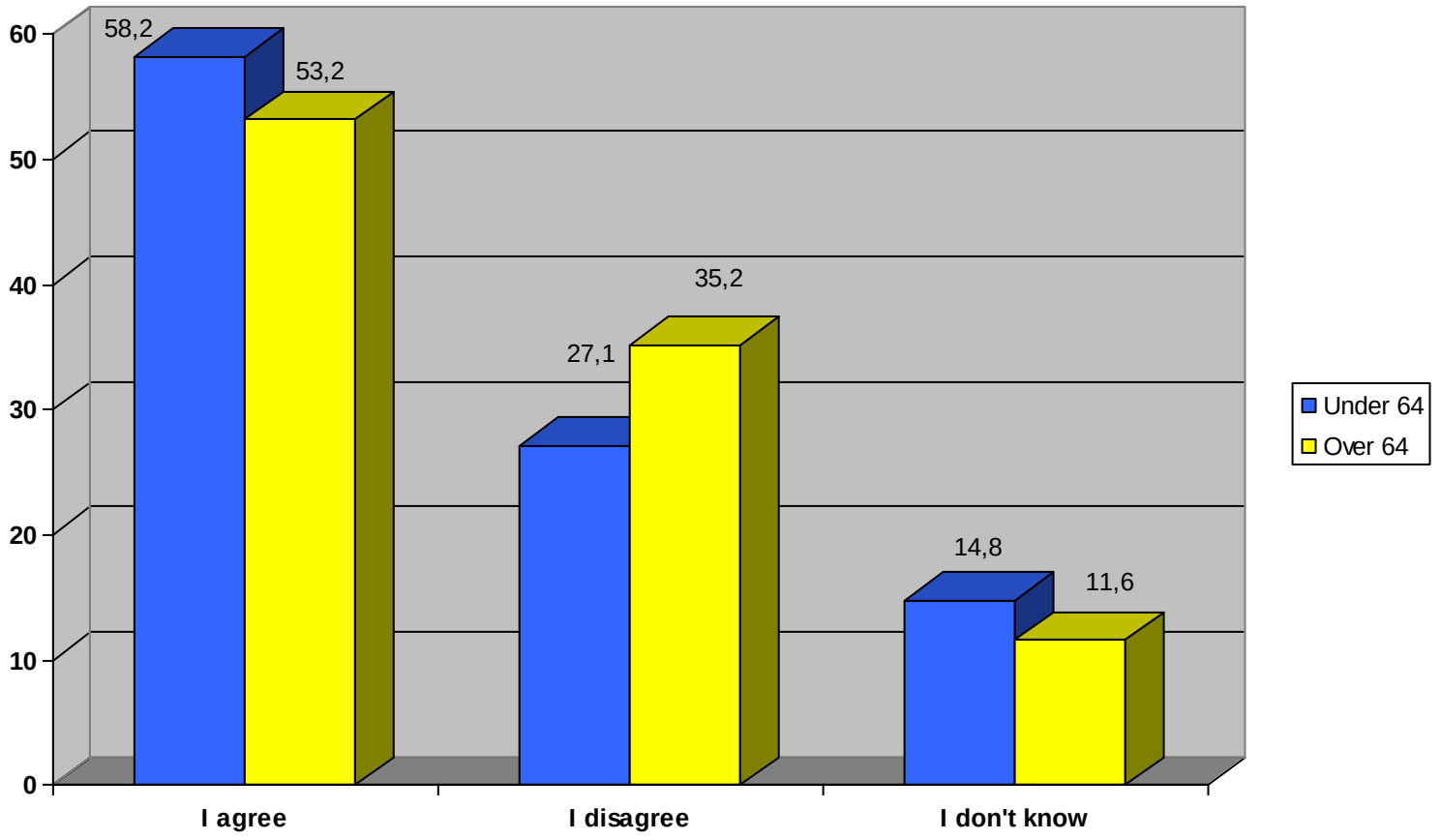
INDIFFERENCE



$\chi^2 = 7.0610$ **p<0.0293**

I would be willing to use the device only for a short period of time, for therapies of a few days

AVAILABILITY



χ^2 =12.2936 **p<0.0021**

EUROPEAN RESPIRATORY JOURNAL

EDITORIAL

Inhaler devices for asthma: a call for action in a neglected field

A. Papi*, J. Haughney#, J.C. Virchow", N. Roche+, S. Palkonen1 and D. Price#

Eur Respir J 2011; 37: 982–985

Choosing the inhaler
Training the patient
Maintaining technique

REVIEW ARTICLE

THE INTERNATIONAL JOURNAL OF CLINICAL PRACTICE

The Genuair® inhaler: a novel, multidose dry powder inhaler

H. Chrystyn,[1] C. Niederlaender[2]

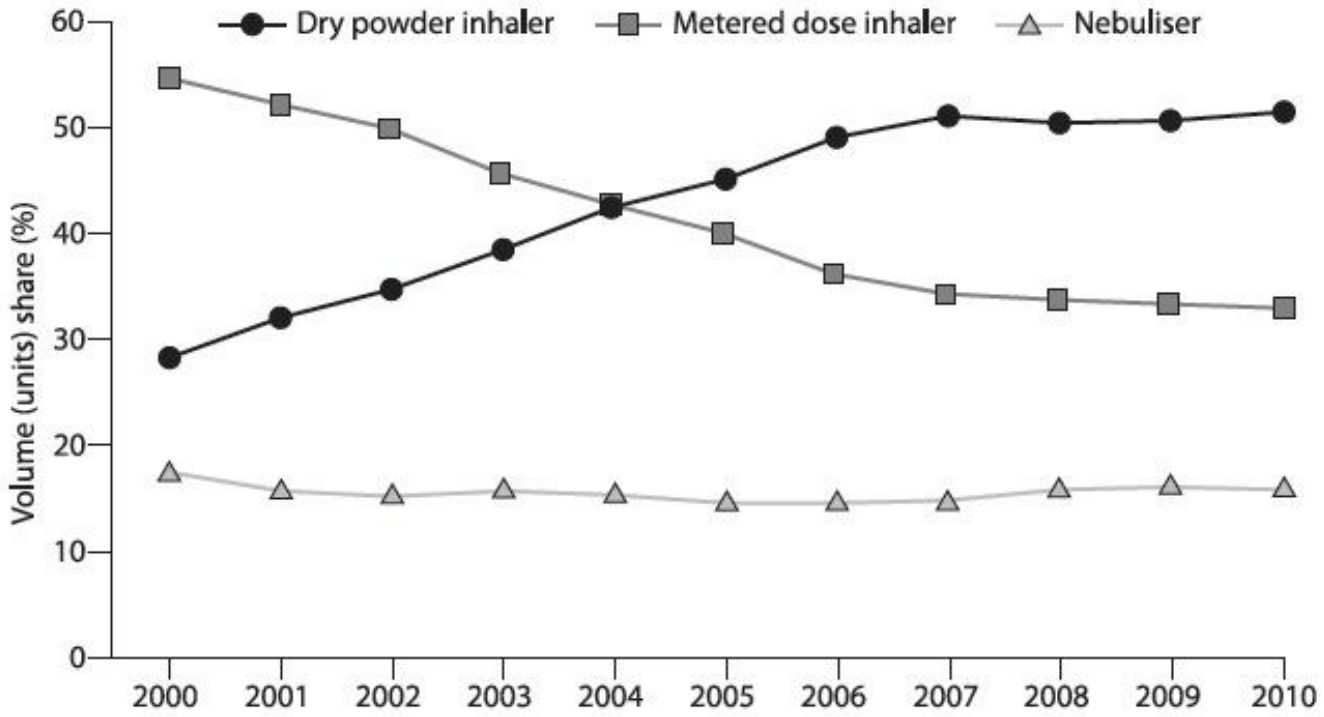
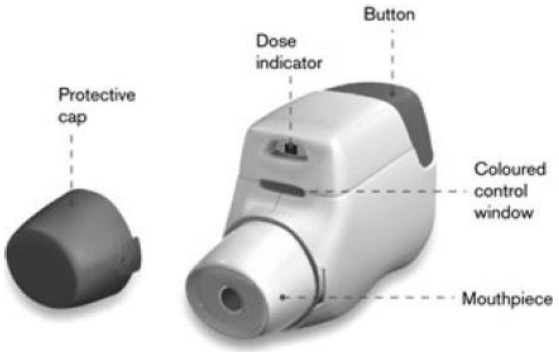


Figure 1 Market for inhaled drugs for the maintenance treatment of obstructive airway disease by device type in five European countries (France, Germany, Italy, Spain, UK) (1)

The Genuair® inhaler: first multidose dry powder inhaler containing a LAMA

- Novel, multidose breath-actuated DPI with 1 month's supply
- Ready-to-use device from the package



Handihaler
Breezehaler

Respimat

Chrystyn and Niederlaender, *Int J Clin Pract* 2012

DPI, dry powder inhaler

The Genuair® inhaler: inhalation is a simple two-step process

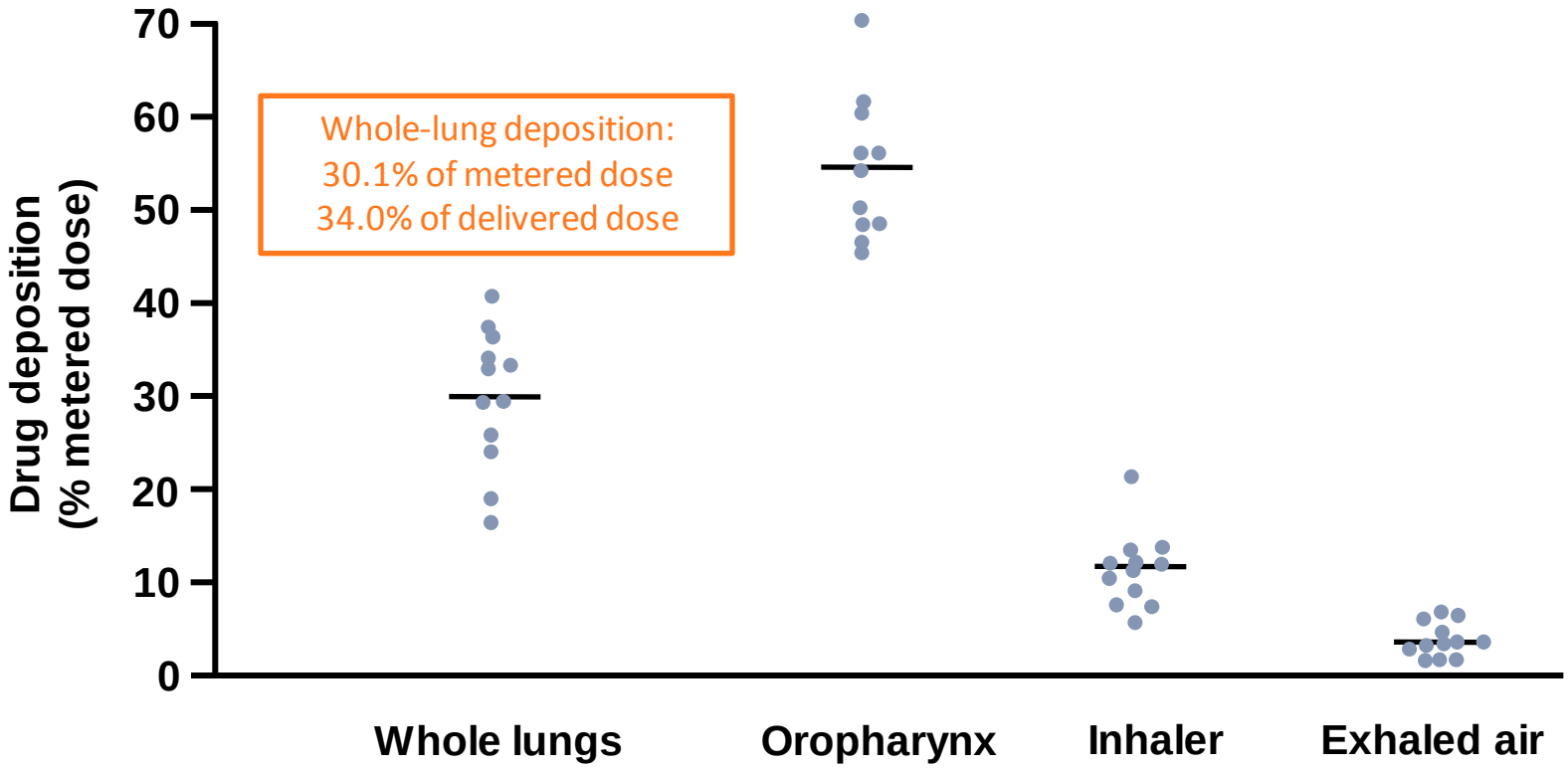
Turbohaler 5
Diskus 4
Nexthaler 3

The Genuair® inhaler: inbuilt safety measures

- Dose indicator
  - Indicates when patient is close to last dose
- Empty inhaler prevention system
  - Button is locked and cannot be depressed after last dose has been taken
- Over-dosing prevention system
  - Only one dose released prior to inhalation, irrespective of how many times button is pressed

Genuair®
Tecnologia

Lung deposition



Newman et al, *Respiration* 2009

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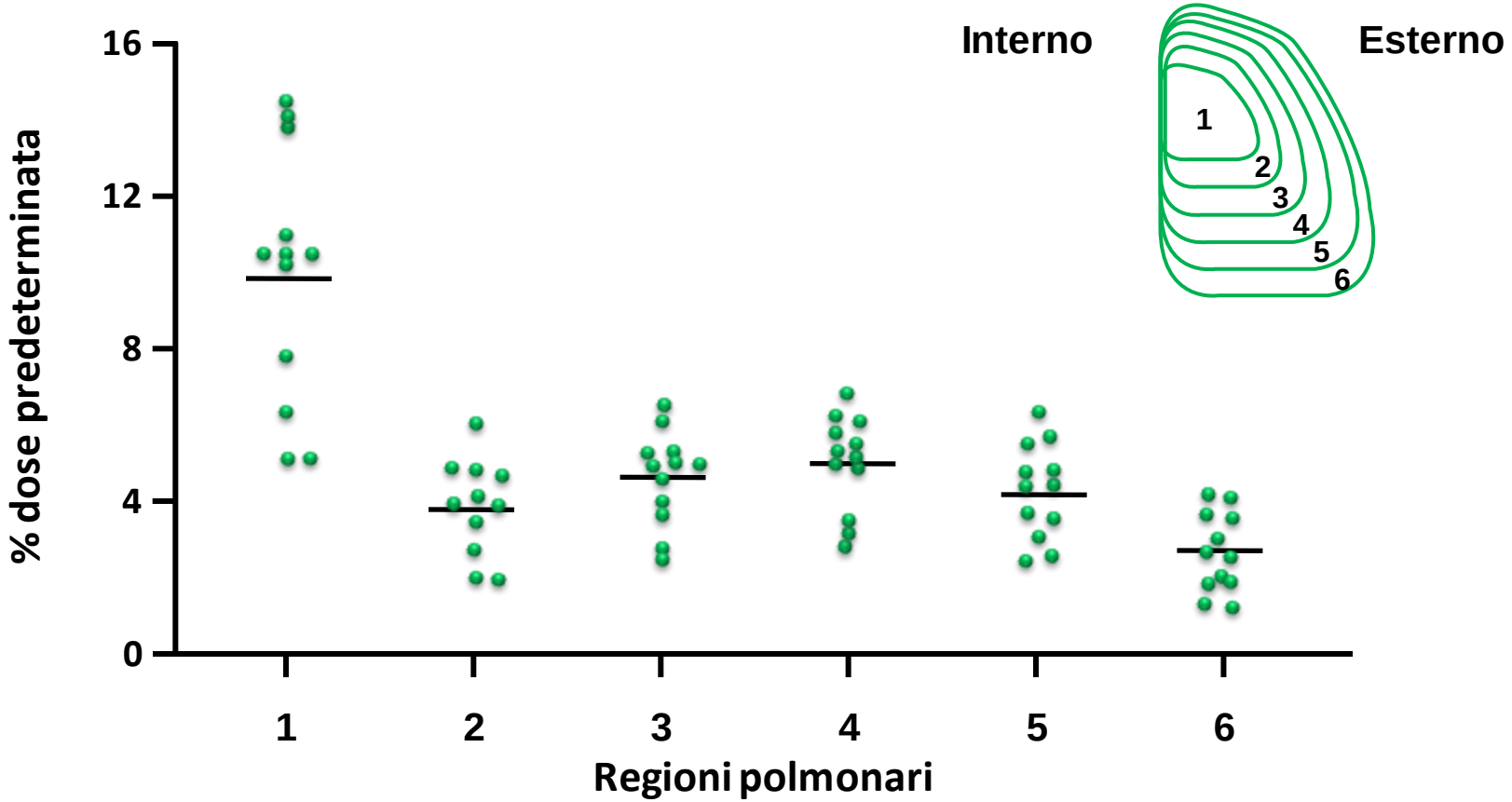
Table 1. Whole lung deposition for the multidose dry powder inhaler used to deliver a formulation of aclidinium in the present study, and for several other DPIs used to deliver a range of drug formulations

DPI	Subjects	% metered dose	% delivered dose	Reference
Taifun®	asthma	34.3 (5.8)	41.6 (7.3)	[24]
Novolizer®	healthy	32.1		[16]
Genuair®	healthy	30.1 (7.3)	34.0 (8.0)	present study
Turbuhaler®	healthy	27.7 (9.5)	32.0	[23]
Clickhaler®	healthy	26.8 (6.8)		[33]
HandiHaler®	healthy	18.0 (5.0)	43.0 (9.0)	[17]
Pulvinal®	healthy	14.1 (3.2)	14.8	[34]
Ultrahaler®	healthy	13.3 (4.8)	13.6	[35]
MAGhaler®	healthy		26.4 (4.3)	[36]
Spiromax® (Airmax®)	asthma		25.8 (6.5)	[37]

Genuair®

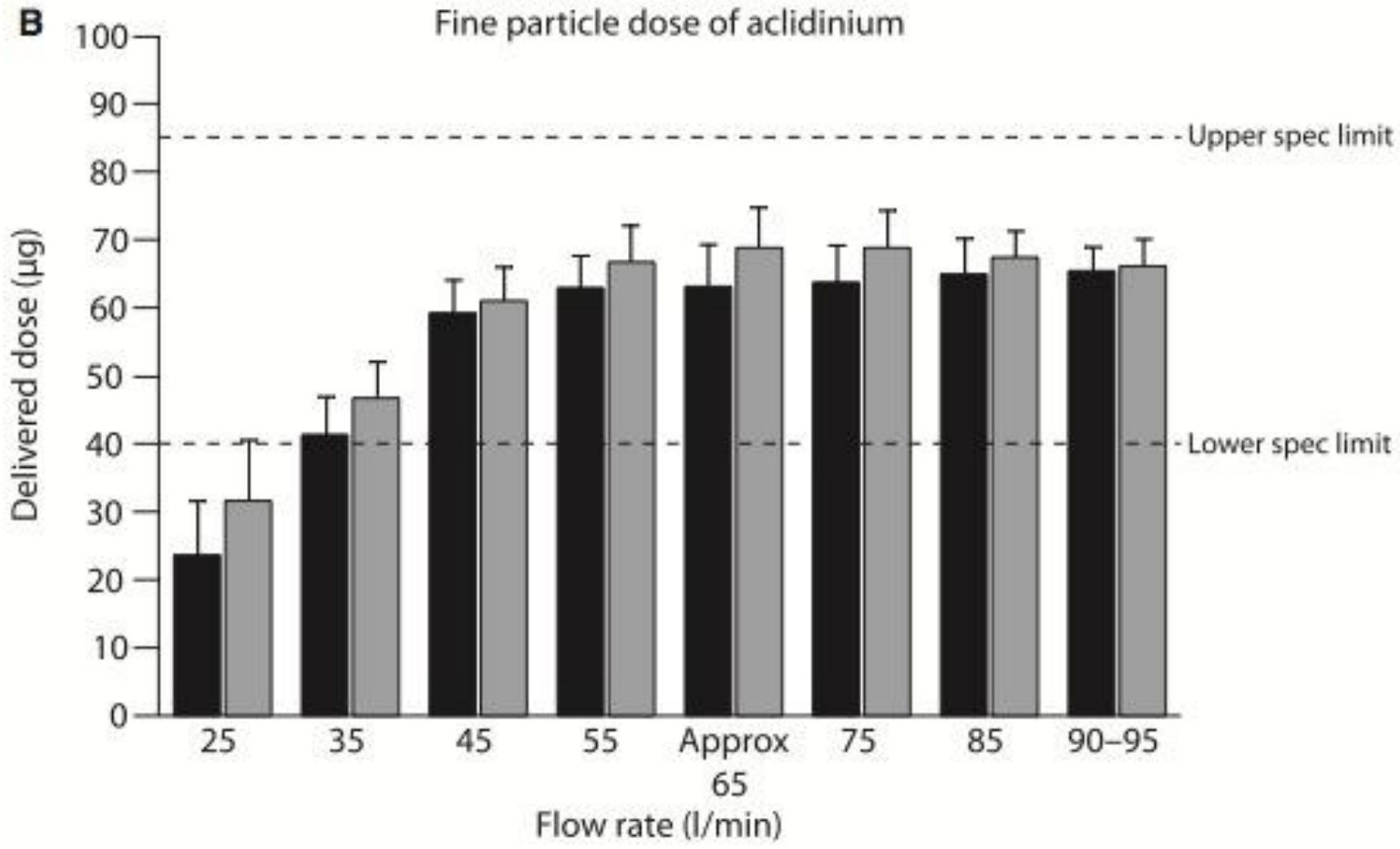
Pattern di distribuzione intrapolmonare



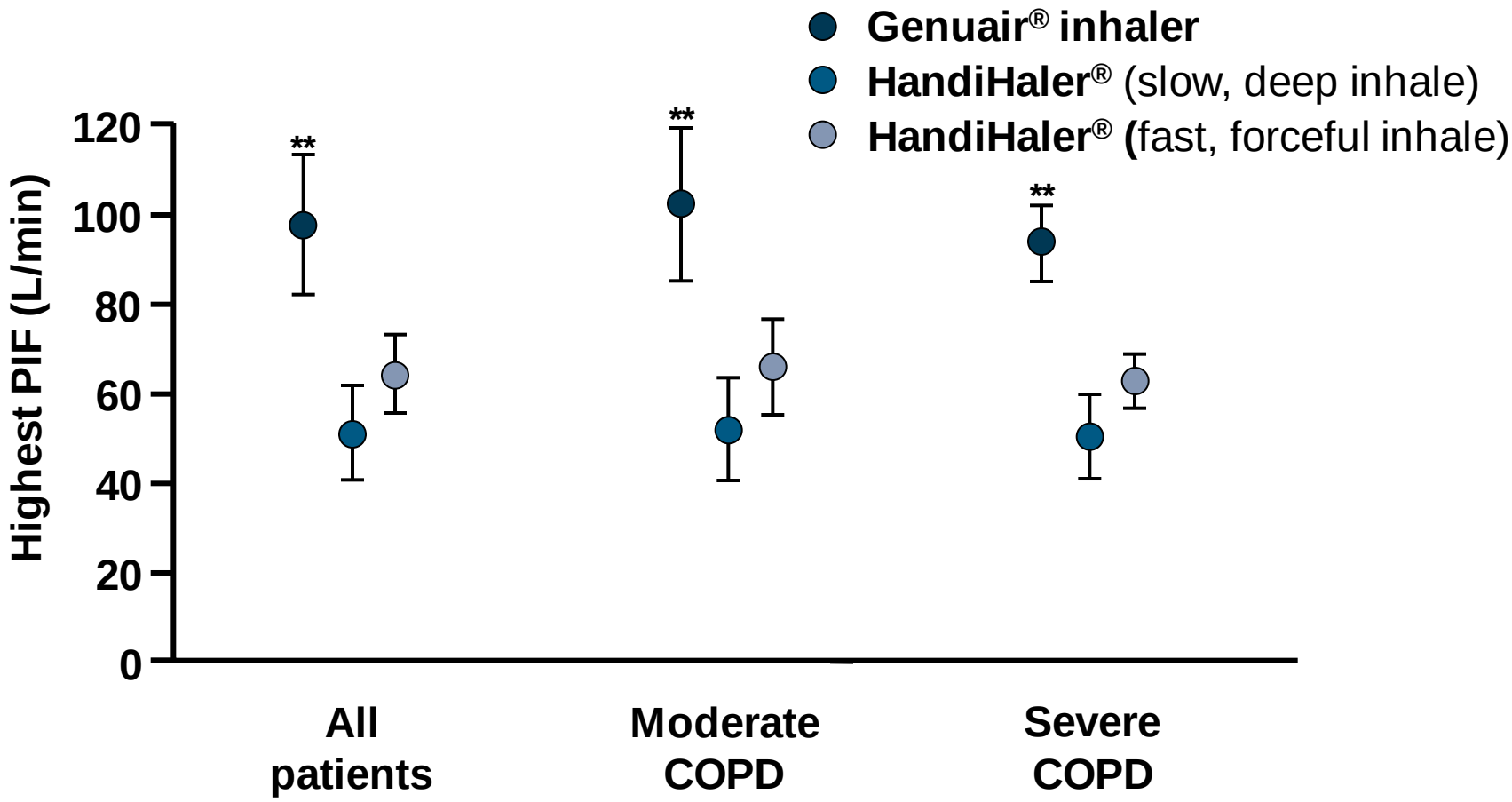
CV = 24%

CV, coefficiente di variazione; dati ottenuti da 12 adulti maschi sani dopo l'inalazione di una singola dose di aclidinium 200 µg radiomarcato con 99mTc

Newman SP, Sutton DJ, Segarra R et al. *Respiration* 2009;78(3):322-328


B
Fine particle dose of aclidinium
Delivered dose (µg)
100
90
80
70
60
50
40
30
20
10
0
Upper spec limit
Lower spec limit
25
35
45
55
Approx 65
75
85
90–95
Flow rate (l/min)

Patients achieved highest peak inspiratory flow (PIF) with Genuair®



Magnussen et al, *Respir Med* 2009

**p<0.001 vs HandiHaler®

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Technical Note

Respiration

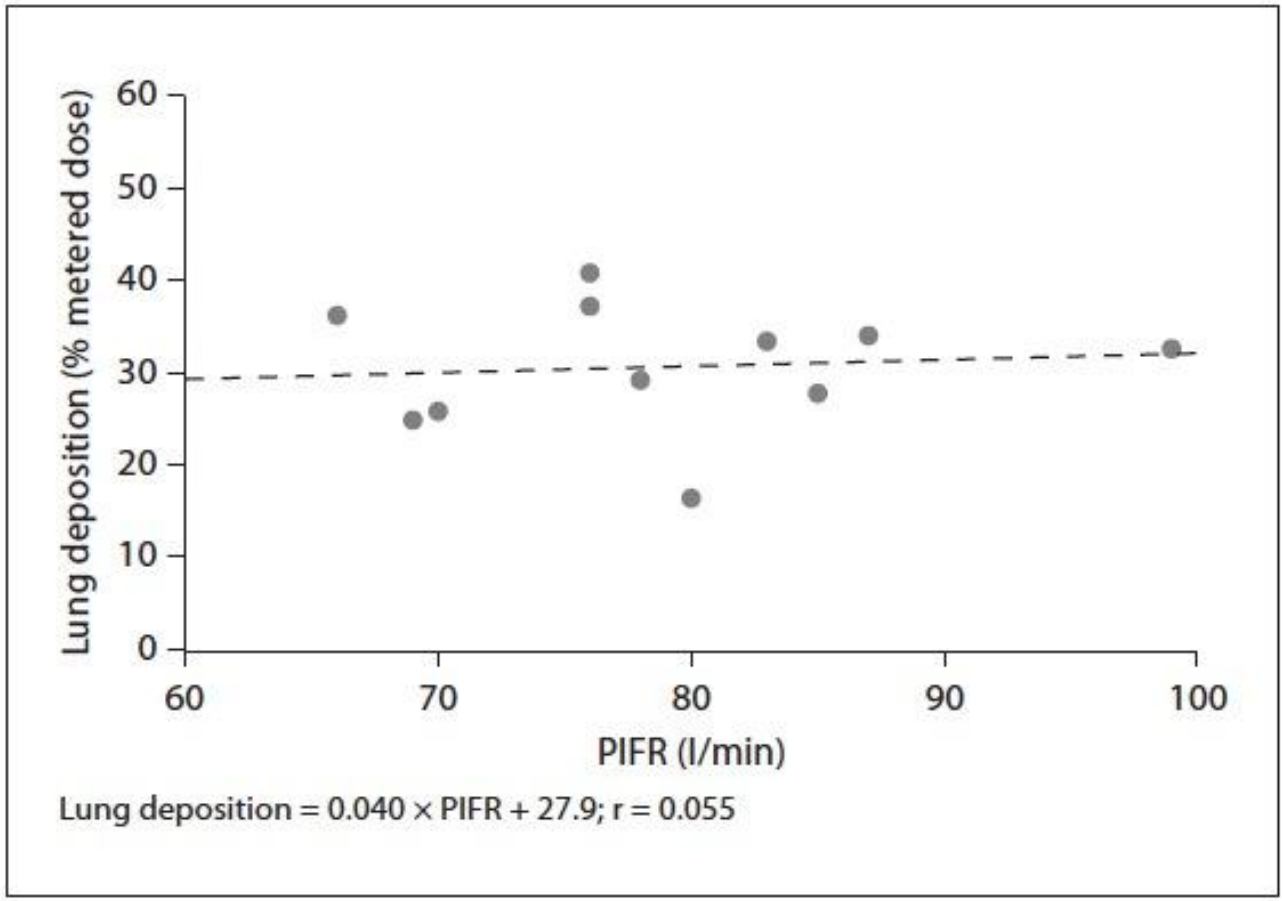
Respiration
DOI: 10.1159/000219676

Received: October 23, 2008
Accepted after revision: March 9, 2009
Published online: May 16, 2009

Lung Deposition of Aclidinium Bromide from Genuair®, a Multidose Dry Powder Inhaler

S.P. Newman[a] D.J. Sutton[b] R. Segarra[c] R. Lamarca[c] G. de Miquel[c]

[a]Scientific Consultant, Nottingham, [b]Pharmaceutical Profiles Ltd., Nottingham, UK; [c]Laboratorios Almirall SA, Barcelona, Spain



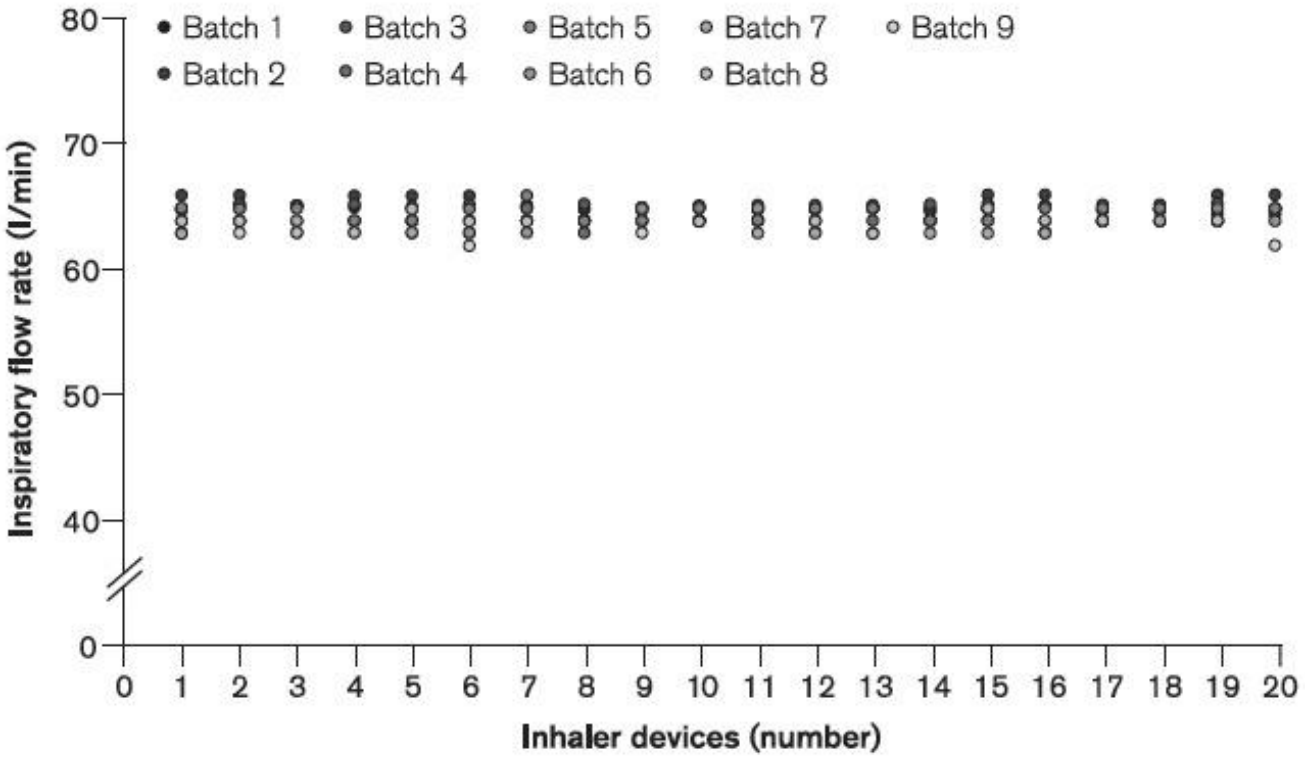


Figure 3 Inspiratory flow rate through the Genuair® inhaler determined at a pressure drop of 4.0 kPa for 20 inhalers randomly taken from nine different batches (20)

Correct inhalations with Genuair® and HandiHaler®

97.2%

of inhalations through Genuair®

were successful (activation of trigger mechanism) and optimal (PIF ≥45 L/min)

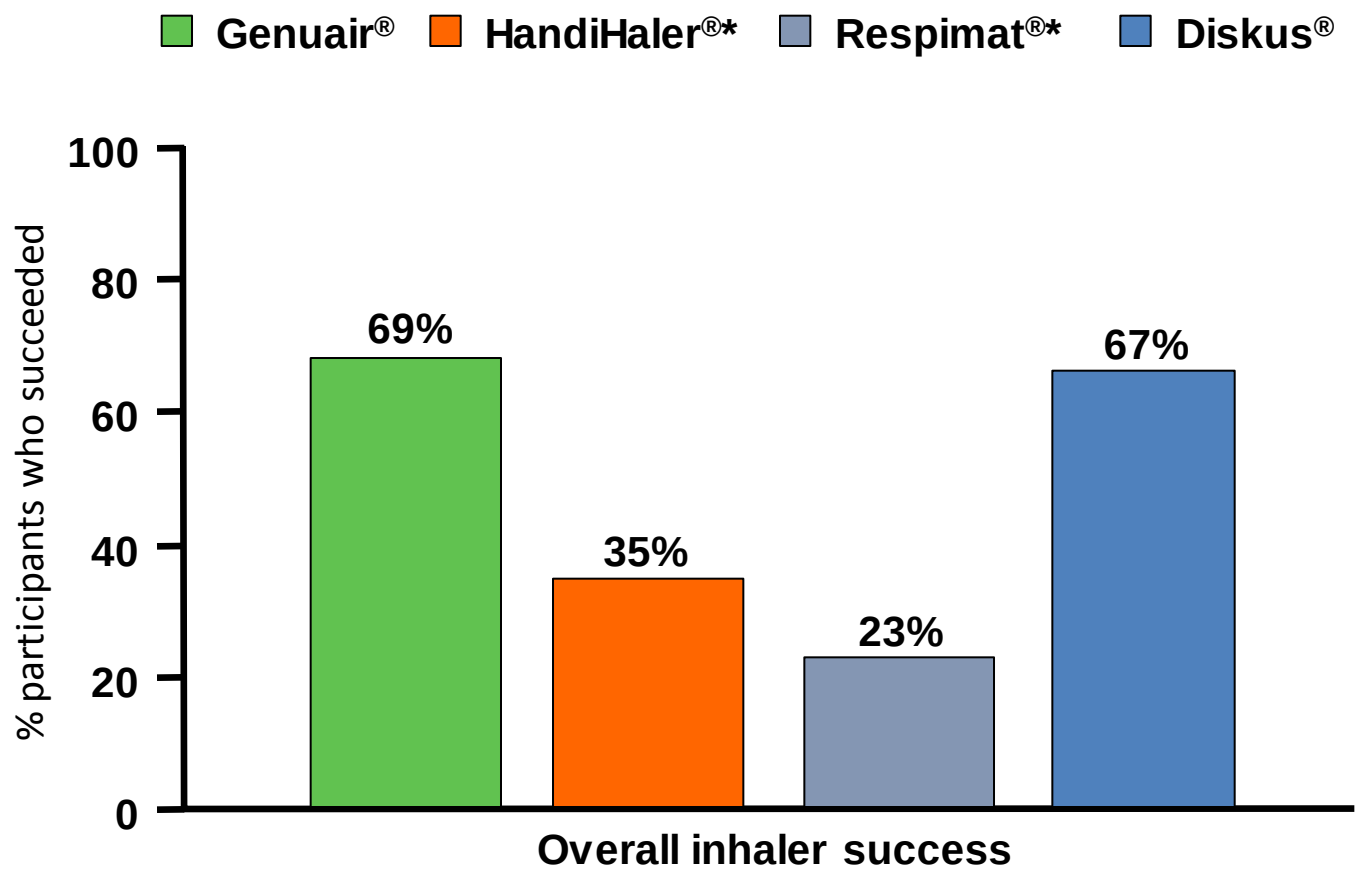
73.6%

of inhalations through HandiHaler®

(slow, deep inhalation) resulted in capsule vibration heard and no powder remaining in the centre chamber

Magnussen et al, *Respir Med* 2009

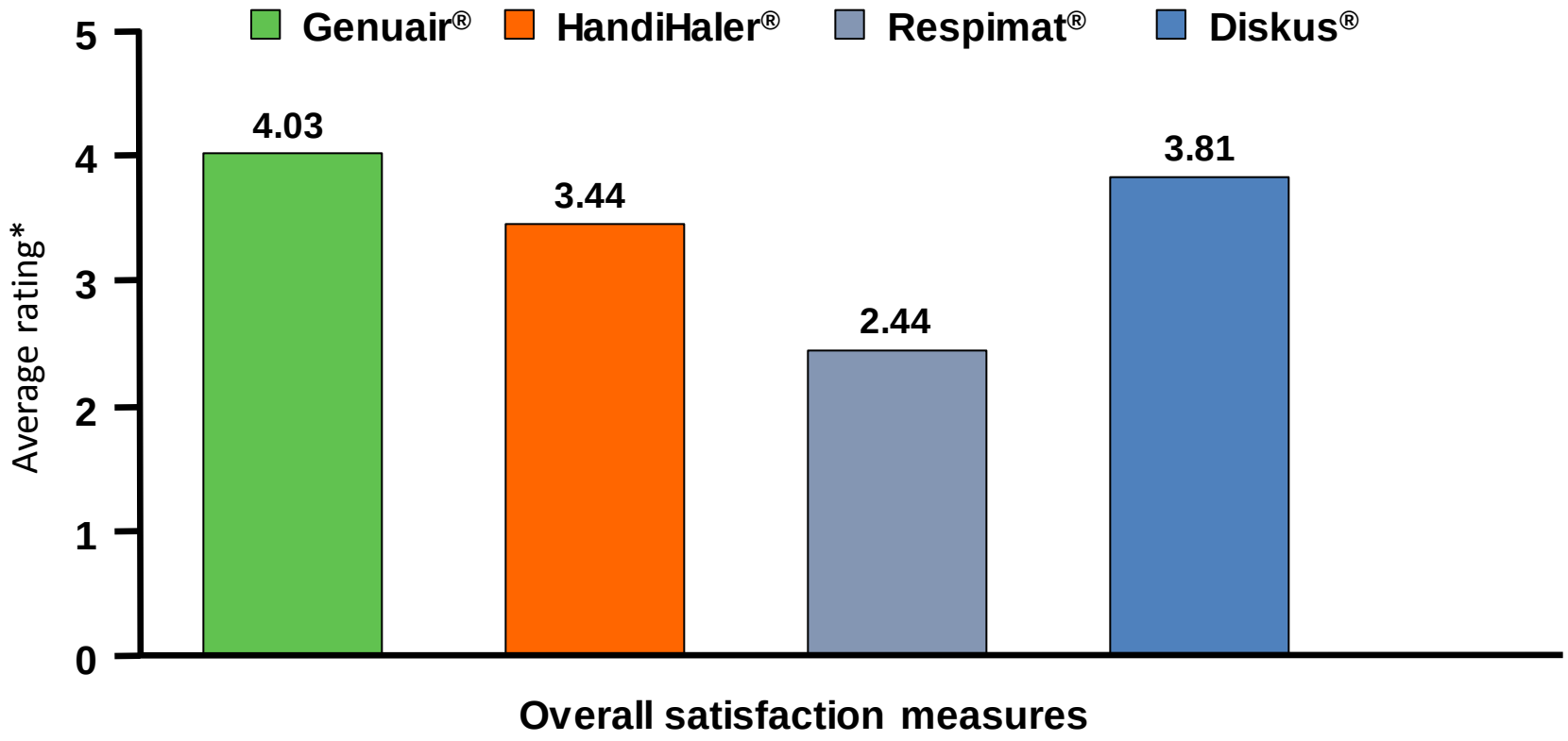
Overall inhaler success is higher with Genuair® compared with other inhalers



Hass et al, CHEST 2010

*HandiHaler® blister pack manipulation and Respimat® cartridge loading were not tested

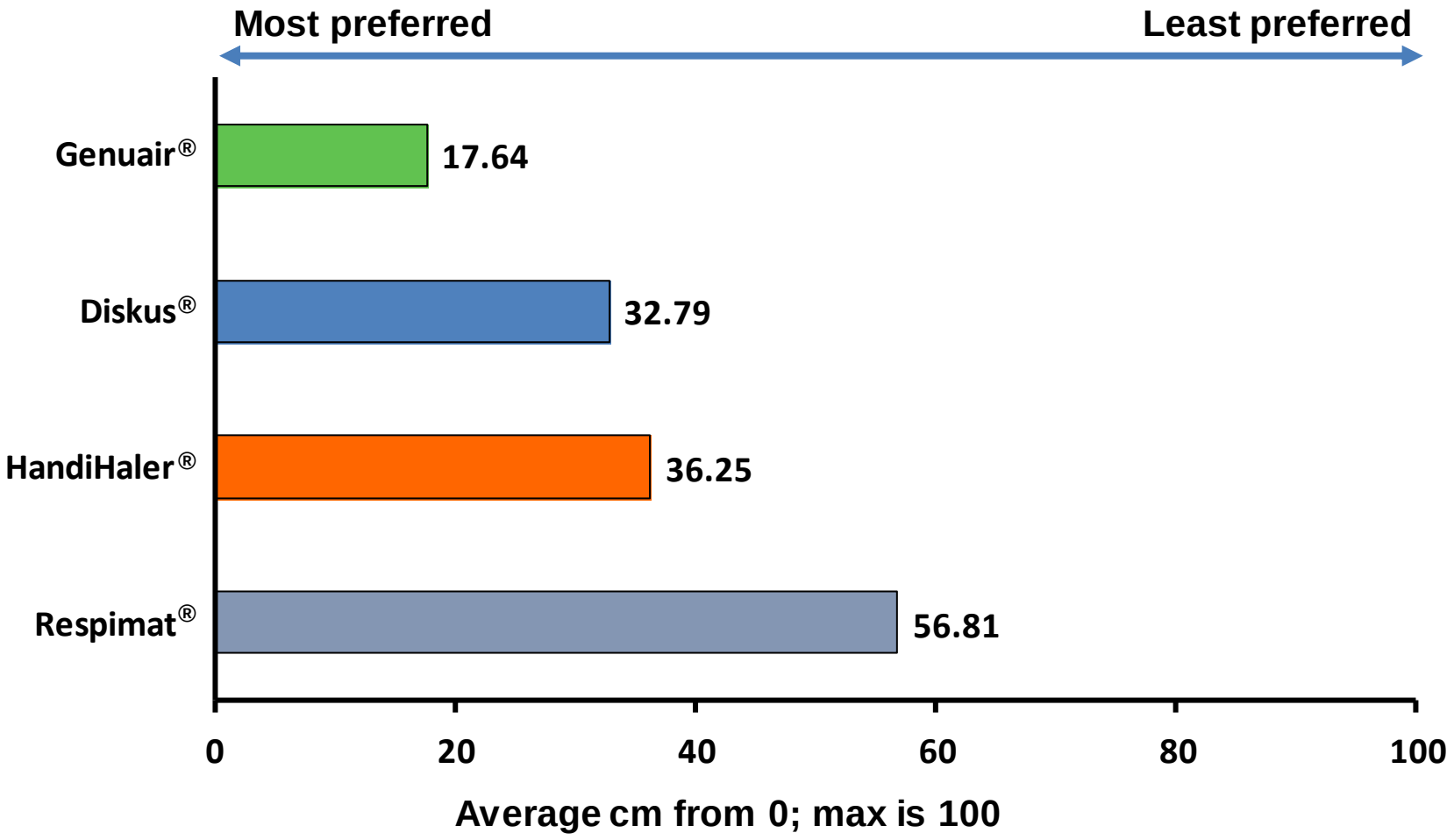
Patients are more satisfied with Genuair® compared with other inhalers



Hass et al, CHEST 2010

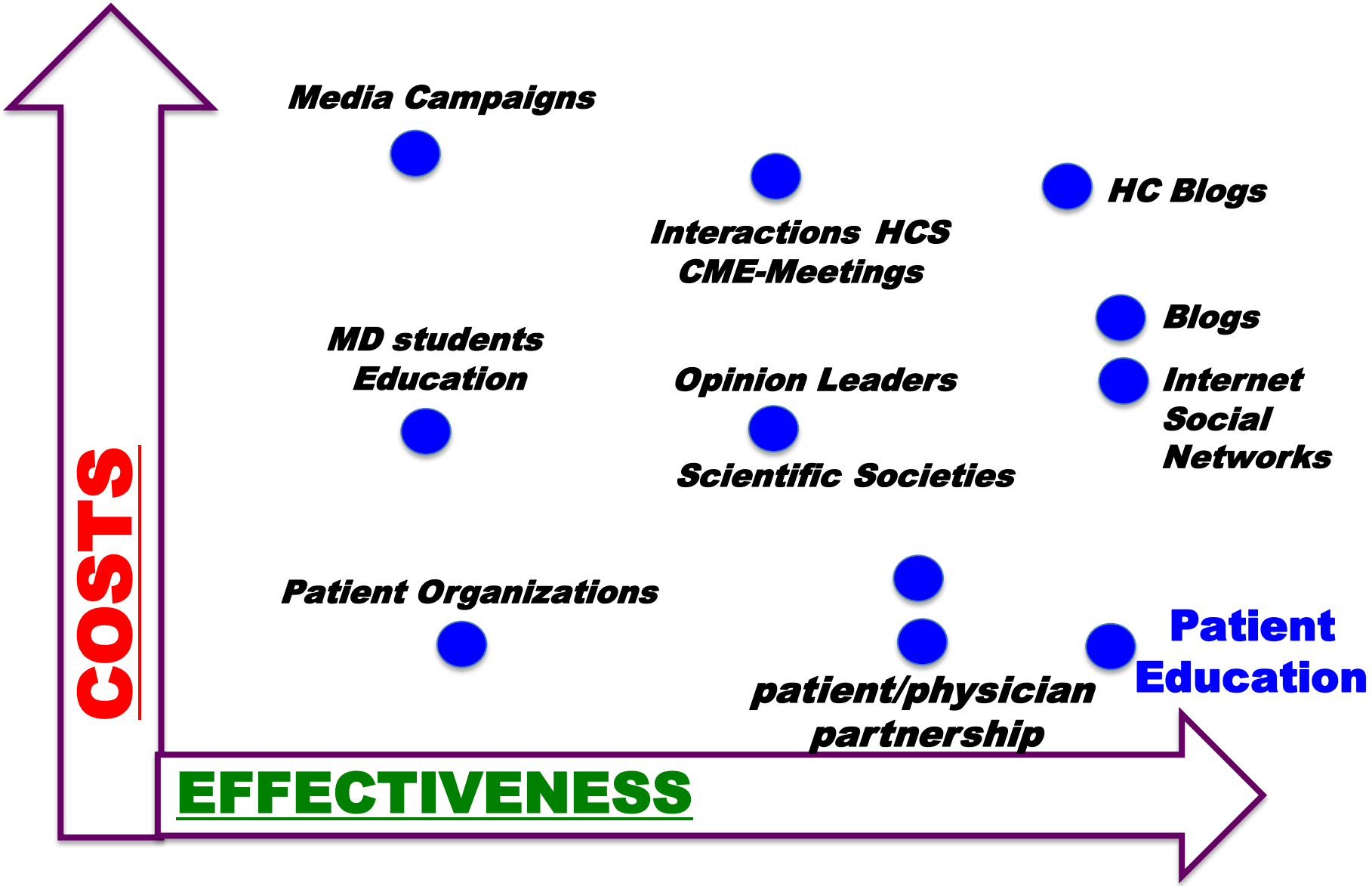
*Rating 1–5 (worst–best)

Patients prefer Genuair® compared with other inhalers



Hass et al, CHEST 2010

ADHERENCE
Implementation Strategies



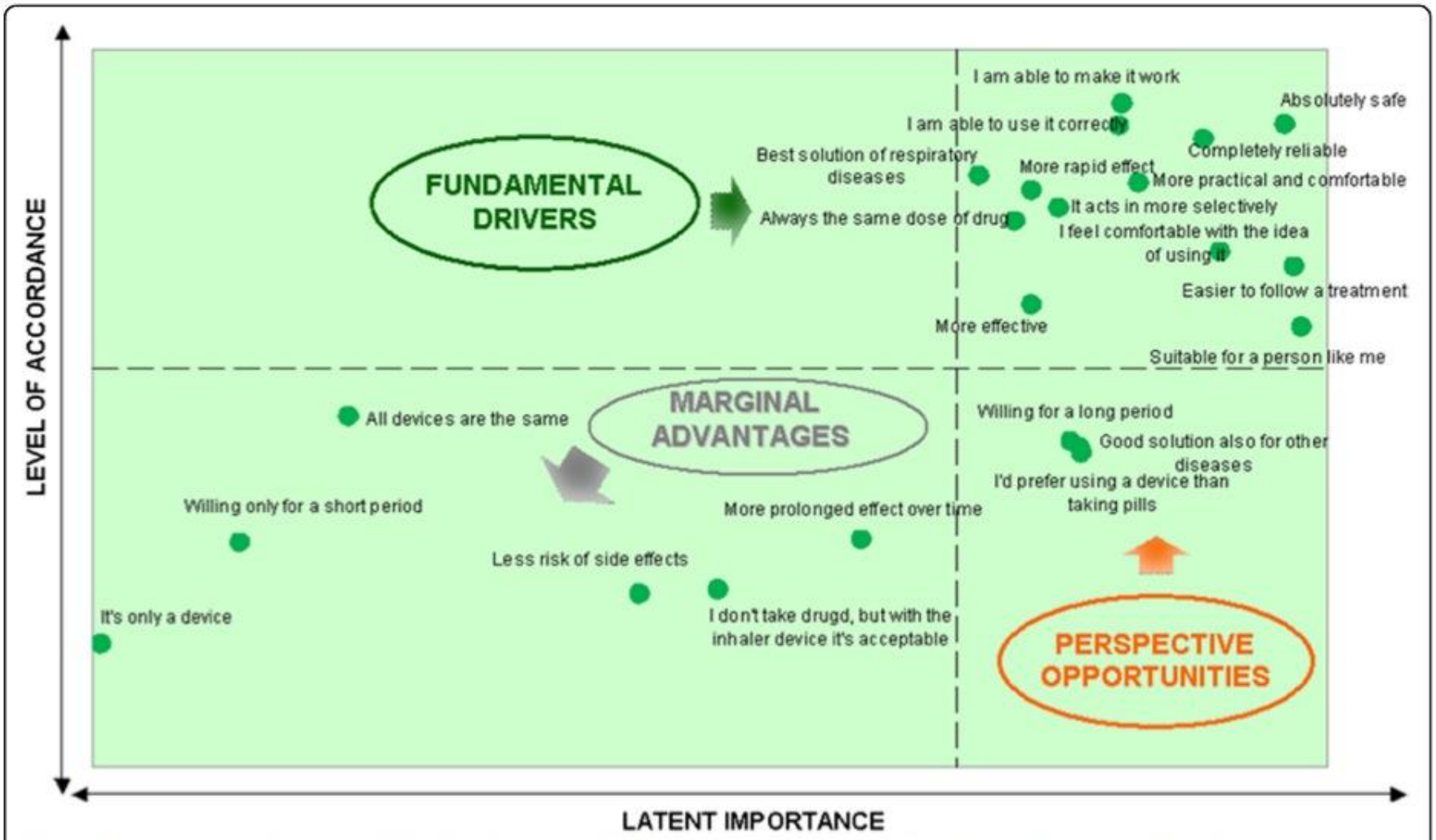


Figure 2 Reasons for adherence: relationship between level of acceptance and latent importance. The upper right side quadrant represents the reasons for adherence already achieved that need to be maintained; the perspective opportunities represent the reasons for adherence for which a return of investment is highly probable. The reasons for adherence, located in the left lower quadrant, represent the issues for which a return of investment is not as probable.

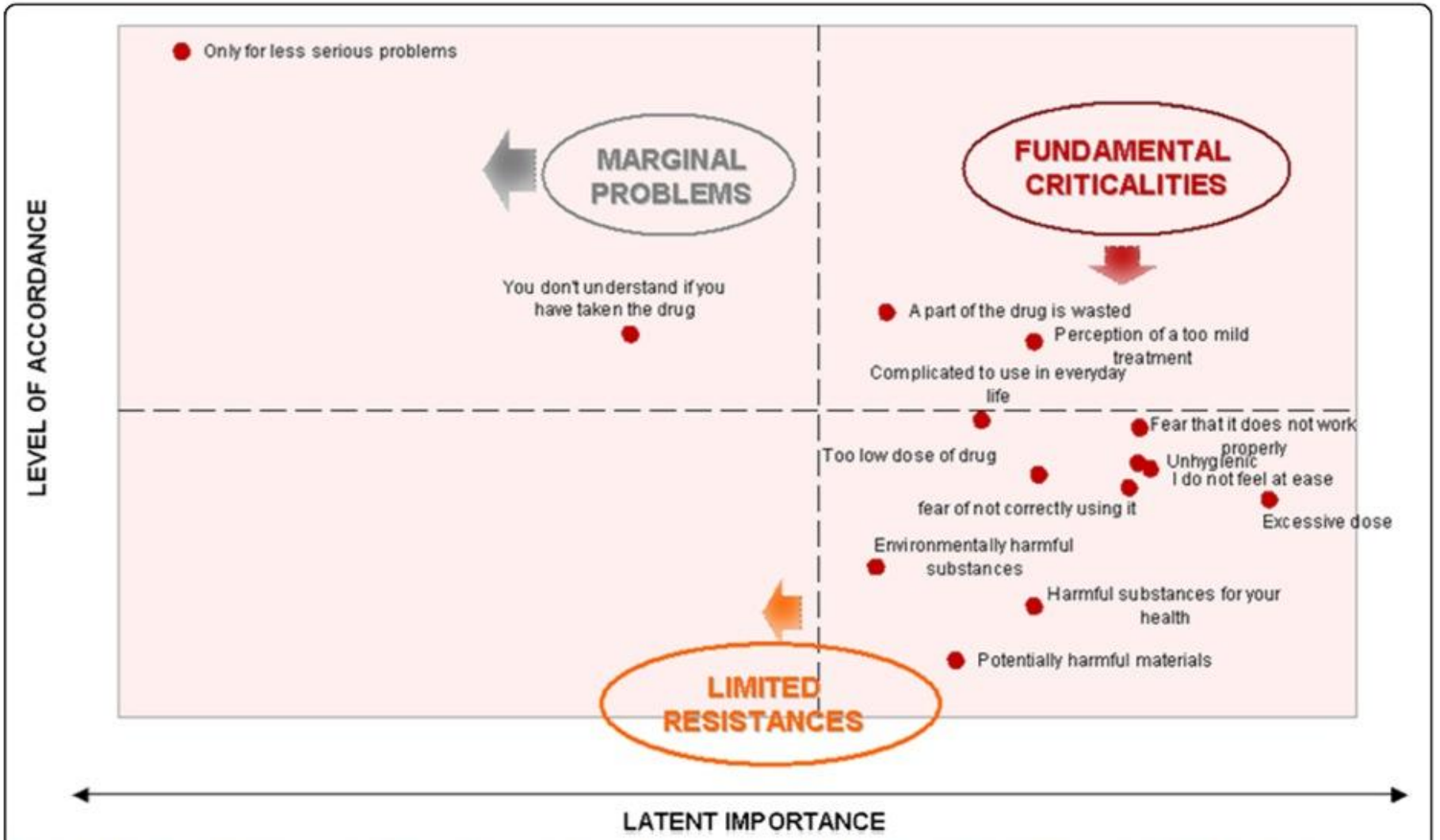


Figure 3 Barriers for adherence: relationship between level of acceptance and latent importance. The lower right side quadrant represents the barriers for adherence already contrasted that need to be maintained; the fundamental criticalities represent the barriers for adherence for which a return of investment is highly probable. The barriers for adherence, located in the left upper quadrant, represent the issues for with a return of investment is not as probable.

The tough math of evidence based health care:

ROI = E x KT2

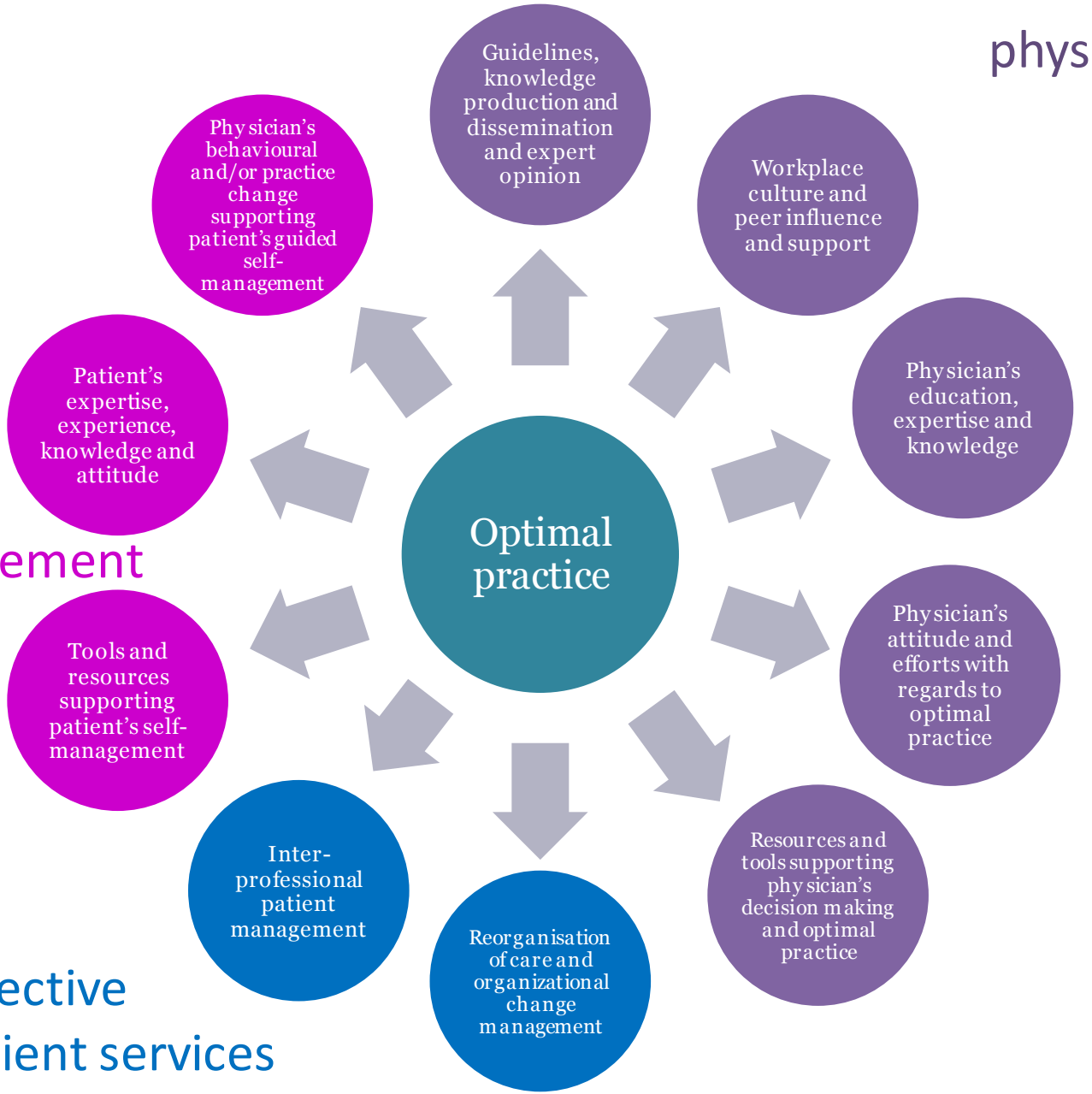
- **ROI = return on investment.**
- **E = efficacy of treatment.**
- **KT2*:**
  - **Physician**
  - **Patient**

*knowledge translation type 2

Haynes, ACP Journal Club 2009

Support physicians to achieve optimal practice

Assist and motivate patients to enact optimal guided self-management



Offer effective and efficient services

Device inalatori nella BPCO:

d'uso, counseling, aderenza alla terapia

Fulvio Braido

Azienda Ospedaliera Universitaria San Martino

Università degli Studi di Genova