

Proposal for relative units of value (RUV) for use in allergy examinations

J.M. Negro Álvarez^{a,h}, A. Pascual Camus^a, T. Murcia Alemán^b, C. Aparicio García^c, J.L. Jiménez Molina^d, J. Hernández García^a, J.A. Pagán Alemán^a, J. Puerta Jiménez^c, E. Serrano^e, R. Ferrandiz Gomis^f and M. Alcaraz Quiñonero^g

^aDept. of Allergology. ^bDeputy Director. Information and Evaluation Systems. ^cEvaluations Unit. ^dDept. of Admissions. Documentation and Archiving. ^eDeputy Director. Medical Services. ^gManaging Director. University Hospital Virgen de la Arrixaca. Murcia. Spain. ^fManaging Director. Hospital San Jaime. Torrevieja. Alicante. Spain. ^hAssociate Lecturer in Allergology. Faculty of Medicine. Murcia. Spain.

ABSTRACT

Health resources are limited and consequently real cost generators must be identified to optimize resources.

In the present article, we describe the structure of the Homogeneous Functional Groups (HFG) for Diagnostic Techniques in the Allergy Department of the Virgen de la Arrixaca University Hospital in Murcia (Spain) and the healthcare products generated.

Based on the 2005 budget, variable costing was used to calculate the costs of the healthcare products generated (skin tests, investigation of drug allergies, etc.) by one of the three HFG (the HFG for complementary investigations).

On the basis of these costs, and taking as the unit the cost of one skin prick test, we assigned relative units of value (RUV) to each of the products in our services portfolio.

The following conclusions can be drawn: 1) the current system of variable costing provides information, which should be useful to health professionals; 2) the real cost generators in the microcosm of daily clinical practice should be identified to allow resource reallocation; 3) the costing system used enables modifications to be made that allow decision making on optimal use of the budget; 4) to take the decisions required to optimize resources, clinical management and complementary tests should go hand-in-hand.

Key words: Allergology. RUV. Relative units of value. Analytical accounting. Homogeneous Functional Group (HFG). Costs.

INTRODUCTION

For some years now our group has been estimating costs in Allergology, as we consider that this task gives added value to our other activities.

The assignation of weighted values to the diagnostic techniques used in Allergology is seen as a necessity by numerous professionals, specialists and Allergology centres to facilitate analytical accountancy and the charging of costs to their departments.

We had twin objectives in mind: the updating of the Services Portfolio or catalogue of diagnostic therapeutic examinations used in Allergology, and the establishment of relative units of value (RUV) for those procedures in our Department. We hope that once

Correspondence:

J.M. Negro Álvarez
Valle, nº 7
30120 El Palmar. Murcia.
Tel.: 968-369615
Fax: 968-369791
E-mail: jnegroa@meditex.es

the proposal has been discussed in the forums of the speciality and accepted by the members of the Spanish Society of Allergology and Clinical Immunology, it will provide an agreed, standardised and ordered list of the procedures carried out in an Allergology Department and could be used as standard terminology.

The availability of RUV for all examinations will permit each Allergology Department to calculate its parameters of activity and performance.

STUDY OBJECTIVES

The objective was to assign weighted values to each diagnostic technique used in the speciality of Allergology, taking the costs for personnel and the costs of materials per examination. The calculation will use as reference the prick-test, which is considered as one unit.

MATERIAL AND METHODS

The examinations have been put in consecutive order following our Department's Portfolio of Diagnostic Technical Services (table I), and are classified according to diagnostic groups. A six figure Code is assigned to each examination, for introduction after the definitive approval of the document.

Information sources

The administrative management of patients in the Outpatients Consultations Department, as well as that of tasks relating to the appointments process and the recording of the actions taken with patients in this Hospital Department, is performed on HP-HIS1® by the Outpatient Consultations module, which provides a flexible system for designing appointment books. This module is designed so that the administrative staff in the Appointments Centre of the Admissions Department for Outpatient Consultations makes the appointments for first time patients, and the staff in the Allergology Unit makes further appointments and any patient requested appointment. The appointments section is an interface presenting the user with all the information required to perform the tasks, such as the scheduling of appointments, registration of new patients, changes in scheduling (cancellations, re-scheduling) or recording of the action performed, in accord with the Unit's profile.

The frequency of controls and the health professional present at each particular visit were defined by the current Allergology Unit schedule.

Table I
Services Portfolio of Diagnostic Techniques of the Allergology Dept.

Name	No. of determinations
Skin tests	110,422
Foods	
Anisakis	
Hymenopters	
Latex	
Pneumoallergens	
Patches and Photopatches	
Tests for medications	1,790
Metacolines	854
Spirometries	3,097
Ophthalmic/nasal reactions	2,232
CAP (IgE and ECP)	5,524
Occupational allergens	
Foods	
Hymenopters	
Medications	
Pneumoallergens	
Parasites	
ECP	
Total IgE	

The data was completed with the costs structure provided by the Evaluations Unit at the hospital.

Procedure for electronic creation of the results sheet

The structure chosen for the introduction and presentation of data was a spreadsheet from Microsoft Excel (Office Professional for XP)¹, configured as a series of pages describing each activity for the departmental evaluations.

Definitions

Physician time

The time used by the allergologist in preparing the report, plus supervision or the examination itself, in the cases where this is applicable.

Nursing staff time

This measures the time taken by the Registered Nurse or Nursing Auxiliary and used in performing the technique.

Table II
Costs structure of personnel in the Special Techniques
HFG of the Allergology Dept. (HFG 388)

Diagnostic techniques	
Costs of personnel	
Nursing Auxiliaries	25,800.00 €
Registered Nurses	121,123.00 €
Physicians	76,910.00 €
Total costs of personnel	223,833.00 €
Running costs	
Total running costs	112,356.28 €
Costs of use of other depts.	
Structural costs	53,362.00 €
	7,595.00 €
Total	397,146.28 €

These times are weighted according to the costs of health personnel, and they therefore reflect the consumption of human resources required for each study.

Relative units of value (RUV)

The relative unit of value expresses the financial cost of each examination performed in Allergology. That is to say, it indicates how much more expensive one procedure is than another reference procedure. The relative units of value are therefore conversion factors which allow us to transform the resources consumed in performing a procedure into its cost in financial terms.

Costs structure

The following costs were considered:

1. Departmental Costs:

- Cost of personnel.
- Running costs.

2. Costs of the use of other departments, such as: Admissions, Management of Personnel, Invoicing and collection of monies, etc.

3. Structural costs.

Procedure for collecting and transcribing data

The planned process began with the request by the physician designated by the group of the required

information from the Evaluation Unit in the department handling the global information sources mentioned. These data were then transcribed to the corresponding cells in the Excel programme, whose previously defined calculations automatically provide the results for the Department. A Clinical Session was later held with the staff in the Allergology Department, when they were informed of the results and provided with an explanation of the glossary of terms.

RESULTS

The results for the activity carried out in 2005 by the HFG "Diagnostic Techniques" in the Allergology Department (HFG 388) are presented in table I, and the costs of the HFG in table II.

If we use the distribution of the time of the professionals involved as a conversion coefficient to distribute personnel costs, the use of other departments and structural costs, we obtain the costs of each of the techniques under these three headings (table III).

Taking the number of determinations performed in 2005, we can calculate the costs of personnel for each determination. If we add the running costs (reagents, etc.) to these, we can calculate the cost of each determination performed (table IV). Please note that this calculation of costs does not take into consideration the capital recouped from investment in apparatus.

If we take the cost of one skin test as the relative unit of value, we can extrapolate the RUV in our Department to other determinations performed (table IV).

DISCUSSION

This article represents the extension and development of previous attempts which had the same objective^{2,3}. It will enable the Allergology Department to evaluate its own indicators after the application of management decisions, as proposed by Rodríguez Padial and co-workers⁴.

Recently, using activity indicators and the costs structure from the first semester of 2005, we estimated the costs of a first and a second visit for the patients attended during that period in our Department⁵. Although we used previously proposed RUV for the calculation of the costs of supplementary examinations, we were aware that it was necessary to update them for the various diagnostic techniques used in Allergology.

The above study went on to reach an agreement with the health professionals working in Allergology on the restructuring of the functional units, classifying

human resources (H.R.) into Homogeneous Functional Groups (HFGs) and distributing them by areas of actions taken in the Department. An organisational chart

Table III
Costs of activities requested by personnel

Name	Time (%)	Personnel	Use	Structural	Total
Skin tests					
Physician	40	20,509.20	3,880.92	552.40	24,942.52
Registered nurse 1	100	40,374.30	9,702.30	1,381.00	51,457.60
Registered nurse 2	40	16,149.72	3,880.92	552.40	20,583.04
Auxiliary nurse	100	25,800.00	9,702.30	1,381.00	36,883.30
Subtotal					133,866.46
Tests for medications					
Physician	50	25,636.50	4,851.15	690.50	31,178.15
Registered nurse	40	16,149.73	3,880.92	552.40	20,583.05
Subtotal					51,761.20
Metacolines					
Physician	30	15,381.90	2,910.69	414.30	18,706.89
Registered nurse	20	8,074.86	1,940.46	276.20	10,291.52
Subtotal					28,998.41
Spirometries					
Physician	10	5,127.30	970.23	138.10	6,235.63
Registered nurse	25	10,093.58	2,425.58	345.25	12,864.40
Subtotal					19,100.03
Ophthalmic/nasal reactions					
Physician	10	5,127.30	970.23	138.10	6,235.63
Registered nurse	25	10,093.58	2,425.58	345.25	12,864.40
Subtotal					19,100.03
CAP					
Physician	10	5,127.30	970.23	138.10	6,235.63
Registered nurse	50	20,187.15	4,851.15	690.50	25,728.80
Subtotal					31,964.43
Total		223,832.41	53,362.65	7,595.50	284,790.56

Table IV
Calculation of RUV from costs

Name	Total Personnel	No. Det.	Cost Test Personnel	Reagents	Cost Test Reag.	Cost test	RUV
Skin tests	133,866.46	110,422	1.21	30,933.28	0.28		
			1.21		0.28	1.49	1.00
Tests for medications	51,761.20	1,790	28.92	790.72	0.44		
			28.92		0.44	29.36	19.67
Metacolines	28,998.41	854	33.96	1,501.6	1.76		
			33.96		1.76	35.71	23.93
Spirometries	19,100.03	3,097	6.17		0.00		
			6.17		0.00	6.17	4.13
Ophthalmic/nasal reactions	19,100.03	2,232	8.56	2,909.38	1.30		
			8.56		1.30	9.86	6.61
CAP	31,964.43	5,524	5.79	76,221.3	13.80		
			5.79		13.80	19.58	13.12

Table V
CAP determinations performed
and HFG making the request

Origin	Patients	Determinations performed	Cost
Adult Consultation	1,310	3,066	60,031.34
Paediatric Consultation	420	1,692	33,120.74
H. Reina Sofía	70	338	6,624.15
H. Morales Meseguer	70	185	3,622.58
H. Rafael Méndez	60	106	2,070.05
H. Virgen del Castillo	50	74	1,449.03
Other	50	63	1,242.03
Total	2,030	5,524	108,159.92

of the different study areas was designed, where the time of each health professional was distributed in accord with the activity performed. This new Departmental organisational chart has enabled us to estimate the costs of the products for HFG for diagnostic techniques in Allergology, and so to assign RUV to the various supplementary examinations performed.

Knowing the real cost of the determinations we perform and the origin of the request for them will permit us in the not too distant future to be able to present invoices between Health Departments (table V), as the Local Autonomous Region of Valencia is at present trying to do.

As we did not find any antecedents on this issue in the bibliographical search performed in the main databases (Medline, Embase, etc.), we hope that after discussion of the proposal in the forums of the speciality and on acceptance by the members of the Spanish Society of Allergology and Clinical Immunol-

ogy, it will provide an agreed, standardised and ordered list of the procedures carried out in an Allergology Department and could be used as standard terminology.

CONCLUSIONS

To conclude, it should be underlined that the present analytical management system: 1) Provides information which should be valid for the clinician. 2) It is necessary to identify the real generators of expenditure in the microcosm of daily therapeutics and so permit the re-assignment of resources. 3) The system facilitates corrections leading to decisions enabling optimal execution of the budget. 4) Clinical management and analysis should work together with the aim of taking the measures required to optimise resources.

REFERENCES

1. Walkenbach J. El libro de Excel 97. Madrid: Editorial Anaya Multimedia; 1997.
2. Negro Álvarez JM, Murcia Alemán T, Aparicio García C, Hernández García J, Ferrándiz Gomis R. Los costes directos de un paciente asistido en la consulta externa de alergología de un hospital universitario. *Alergol Inmunol Clin*. 2005;20:4-9.
3. Negro Álvarez JM. La gestión clínica en alergología. Curso de Gestión Clínica. Alergología. Madrid: Sanidad y Ediciones; 2002.
4. Rodríguez Padial L, Romero Gutiérrez A, Moreu Burgos J, Maicas Bellido C, Alcalá López J, Castellanos Martínez E, et al. Efecto de la gestión de un servicio de cardiología en la atención del paciente cardiológico. Evolución de los indicadores asistenciales. *Rev Esp Cardiol*. 2002;55:1251-60.
5. Negro Álvarez JM, Murcia Alemán T, Aparicio García C, Jiménez Molina JL, Hernández García J, Puerta Jiménez J, et al. Direct patient treatment costs in the Allergology Service of a University Hospital. *Alergol Immunopathol*. 2006;34:150-5.