

The Master Plan of Human Resources: A New Tool for the Enhancement of the Profession

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Abstract

Aim: This work represents the experience of the department of radiodiagnostics of the Health Services Company of the Autonomous Province of Trento (APSS) which, in collaboration with the Human Resources Development Service, has shared and adopted the clinical competence system with the aim of supporting the choices on staff organization, maximizing the levers of development and the motivation of each one.

Methods: The general health situation always requires us to maintain constant levels of activity despite the limited economic and technological resources. To meet this need, our team considered it necessary to carry out a map of the skills of health professionals according to the criteria of the “clinical competence” system. To make a correct mapping, some parameters have been taken into consideration: the increase in the average age of doctors, the specialization of the supply network and the development of technologies.

Results: The application of the “clinical competence” system allowed us to set ourselves the goal of highlighting both the excellence and the areas that can be improved. The “clinical competence” system also gives us the opportunity to highlight the current critical issues or those that could appear in perspective. Everything has been conceived in a departmental/business logic (which coincides in our reality in Trentino).

Conclusion: Where strategies include the acquisition of people or the development of development paths, the departmental “Master Plan Human Resources” becomes a new strategic tool for negotiation with company management.

Keywords: Clinical competence; Human resources; Enhancement of staff

Introduction

The evaluation of radiological performance is a subject of considerable interest since it is increasingly difficult to cope with the tumultuous growth of the demand for imaging performance. The problem is also felt in the Autonomous Province of Trento (PAT) where, despite the characteristics of political autonomy and administrative, it is still to face a context of limited economic resources, aging of the medical class and a high Turnover of medical specialist [1].

Young doctors radiologists, who often come from other regions, although they can find more work in the province than other national realities, for various reasons, not least the logistical one for the relative isolation typical of Alpine regions, due to the absence of a faculty of medicine and the cost of living, higher than other Italian regions, tend quickly enough to leave the provincial workplaces to move to other realities more appropriate to their expectations.

In a period of about 10 years we have in fact lived a whole generational change of the medical group especially in the structure of Trento. We are also witnessing another interesting phenomenon which is the largest number of women who perform the profession of radiologist; In Trentino, the number of women radiologists exceeds 50% of the total radiologist physicians. The mapping of competences and evolutionary lines (biennials) are therefore important phases of the human resource management strategy at departmental level. The next step to the mapping was to write a document, the “Master Plan” of human resources that wants to be a useful tool to support the decisions.

General considerations and previous years

The Department of Radiodiagnostics for images, unique throughout the PAT, covers the following areas: Radiology (five operative units), nuclear medicine, senology. The UO of nuclear medicine and the U.

O. of clinical senology are part of the hospital structure of Trento; The radiology Operative units are divided into all the hospital structures of the Provincial Hospital Service (SOP), according to a multizonal organizational model, starting from January 2016. Specifically, in addition to the operating unit radiology of Trento, Cles and Tione are the Multizonal Operative units (U.O.M.) of: Rovereto (with operational headquarters also in Arco)-Borgo (with operational headquarters also in Cavalese).

Below are the events or trends that have occurred in the past years and still affect the activities and skills of the department.

Corporate organizational lines

- The establishment of multizonal operative units.

The setting of the operating units according to a multizonal organization has therefore the variation of the departmental guard, currently being studied in a specific project.

- The establishment of the surgical network.

The breakdown of the access of patients with surgical problems also has consequences on the distribution of radiological competences in the different locations. In line with the reorganization of the surgical network, the patient with related or complex time issues is intercepted

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in the different locations and transported to Trento: this impacts on a distribution of competences in the hub (interventional, Angio Tac, etc.).

- The introduction of the thresholds by structure and by operator.

With the resolutions of the General Manager N. 122/2016 and no 500/2014, the annual minimum volumes of activities were introduced per single structure and per operator, with the need to ensure the growth and maintenance of the competences acquired, in favour of patient safety and concentration of resources [2].

The impact of development of specific clinical activities on diagnostic services

The new activity of proton therapy: The introduction of Proton therapy has affected both the demand for performance and the human resources of the Department. In fact, it required a reinforcement of competences in the Neuroradiological area and for the head-neck and in the pediatric field both of radiology and of nuclear medicine and opened new possibilities for the investment of technical personnel. This led to the transfer of some technicians of consolidated experience and the consequent acquisition by the radiology of new resources to be formed.

Moreover, with regard to nuclear medicine, the initiation of Proton therapy has led to: an increase in the demand for benefits, with consequent lengthening of the waiting time for the acquisition of PET-TC examinations, the introduction of new molecules for use Oncology, with the consequent need for specific training for physicians and for technical and nursing staff.

Oncogynecology: In line with the definition of the surgical network, the mission of the U. O. of gynecology of Trento concentrates more strongly than in previous years on the surgical activities in the oncological field; The focus on Oncogynecology has required diagnostic services to reinforce sophisticated procedures, especially in the field of MRI.

The development of vascular interventional activity: The activation of a second place of delivery of vascular interventionists (Diabetic foot path) in different hospitals, saw the need to increase the support of radiology technical staff to ensure the Conduct of the procedures that for the diabetic foot path are managed both by vascular surgery for medical activity and nursing, and by radiology for the management of equipment and technical personnel [3].

Activation and development of neurosurgery: This activity has involved a growing impact on diagnostic and interventional activity, to induce the establishment of a complex structure of interventional neuroradiology with a unique multi-territorial valence for the two autonomous provinces of Trento and Bolzano.

Open issues

The stroke pathway

It provides for the patient's placement in the location in which it is addressed, through the execution of the TAC, and the eventual continuation to Trento for the treatment endovascular H24.

The Technological evolution

The implementation of alternative methods to traditional contrast graphical techniques and the introduction of new radiopharmaceuticals for use in PET-TC and for the use of metabolic radio therapy. The evolution of technology in favor of alternative methods affects the distribution of competences between "generations": young people

are more skilled in the new introduction methods, compared to the traditional ones (for example: Matt barium enema vs. Colon TC, PET Cerebral FDG vs. cerebral PET with FET). This affects the balance of waiting lists on the alternative methodology and the diagnostic offer.

Higher quality of performance

Technological progress also means strengthening of the activities/procedures less important on the user and investing on them the competences of the staff (for example, bowel-MRI vs. bowel Barium enema; multi-parametric MRI study of prostate vs biopsy Random Eco Wizard; cardio-MRI). In line with the improvement of the quality and for the purposes of the criteria inherent in appropriateness, nuclear medicine has adhered to Slow Medicine, producing a manifesto published on the portal for the performance appropriate to the clinical and alternative question. To support the open needs the first step is to map the available skills [4].

Methodology

The process of assigning skills was rather articulated and laborious, often hindered by clinicians and even by unions that had not understood the purpose and lasted more than two years. After multiple meetings between UOO directors, clinicians and professional development managers in which they have been illustrated, explained and finally shared the objectives of the mapping, we have managed to obtain a photograph of the competences acted by the individual Doctors for all the cataloged items. In the initial phase, catalogues of distinct activities have been drafted for radiology, for senology and for Nuclear medicine.

Two years later, after the union resistances and finished the catalogue of diagnostic activities, the clinical competences of all the medical radiologist of the Radiodiagnostics department, which was unique for the entire autonomous province of Trento, were mapped. The criterion of evaluation was to assign to each professional a value of competence expressed according to increasing degrees: 0 (non-applicable activity, due to lack of individual competence or lack of availability of the method); 1 (Observer level) 2 (activity performed with a tutor); 3 (activity carried out independently); 4 (activity carried out with advanced competence); 5 (Degree of maximum competence, supervisor and dedicated to tutor activities for the less experienced colleagues).

The particular distribution of the personnel in the various operative sites has made the mapping phase more complex because in some offices, where the medical staff was formed only by two or three people, the competence was elevated in the various activities for the local office But not consistent with the skills of other colleagues in larger venues with higher clinical case histories. It was therefore necessary to carry out a homogenizing work of the evaluations, which was carried out collegially by the directors of the operative units.

The second phase allowed the results to be lowered in the context of the group. The analysis of the composition of the medical group has considered the problems that may affect the distribution of competences and the stability of the teams and that must integrate the mapping of clinical competence. In particular, the factors considered were the ageing of staff and the balance between generations; the reconciliation of working life and private life; the planning of long absences; the company's ability to attract and retain professionals.

The analysis showed a series of indicators (Table 1), such as: the number of people who are close to retirement within a period of five years, the competence of which must be forwarded to the rest of the group; number of women under 45, subject to periods of long

absence due to pregnancy, for which it was necessary to provide for the protection of competences acquired by them and to foresee organizational continuity; number of applications for mobility between hub-spoke structures; number of professionals residing outside the province.

In the third phase, we tried to envisage the possible scenarios of change and evolution of radiology in the next two years about: evolution

of technologies and clinical needs, organization, acquisition of new resources, development of Resources presents and staff management.

Results

The Department of Radiodiagnostics is made up of all the single and multizonal operative units of Trentino, the operational unit of Senology and the operative unit of Nuclear Medicine. Both for nuclear

Variables			Consolidate skill	To grow skill		Transmit skill (to 2022)			Retain skills		Retain inside skills		
Department	N.tot. physician	N. Directors	N. Doctor <5 anni of activity	N. Physicians under 50	%	N. Physicians 66 years old to 2022	N. Directors 66 years old to 2022	%	N. Women under 45	%	N. Physicians under 46 residents out PAT	N. mobility demands from hub	N. mobility demands from spoke
Radiology	47	5	12	33	70%	5	4	15%	19	40%	4	0	1
Nuclear Medicine	6	1	0	4	67%	0	0	0%	1	17%	0	0	0
Senology	6	1	1	4	67%	1	-	14%	1	17%	0	0	0

The table illustrates the number of persons who, on the basis of the data base, could abandon for retirement within the next 5 years, whose skills must be transferred to the rest of the group, according to a schedule; Number of women under 45, who can therefore undergo a long absence to be managed to protect both the competences acquired by the person and organizational continuity; Number of applications for mobility between hub-spoke structures; Number of professionals residing outside the province.

Table 1: Skills in the context of the group.

Variables		0. Not assigned	1. Observer	2. Tiling	3. Autonomy	4. Advanced autonomy	5. Supervisor
US	Ceus	24	10	7	3	2	1
	Body	44	0	0	1	2	0
Angiography	Neuro	44	0	0	2	0	1
	Stent Placement	44	1	0	0	1	1
Interventional Neuro	Embolizations	44	0	1	0	0	2
	Transcatheter Fibrinolysis	44	0	2	1	0	0
	Embolizations	44	0	0	1	2	0
Interventional Vascular	Stent Placement	44	0	1	0	1	1
	Rivascolarizations	44	0	1	0	2	0
	Caval Filter	44	0	1	0	2	0
	Tace Treatment	44	0	1	2	0	0
Interventional Body and Orthopaical	Drains	44	0	1	1	1	0
	Rsp	44	0	0	3	0	0
	Tips	46	0	0	1	0	0
	Biliary Stent	43	0	1	2	0	0
	Vertebroplasty	46	0	0	1	0	0
Contrast Enema Diagnostic	Defecography	36	4	6	0	0	1
	Lap-Salpingography	31	0	7	4	4	1
MRI	Heart Mri	28	12	4	0	1	2
	Advanced Mri Neuroimaging	27	0	12	3	5	0
Pediatric Area	Us First Level	3	0	13	26	3	2
	Us Second Level	30	1	12	2	2	0
	Pediatric Rx	1	0	8	31	5	2
	Pediatric Tc/Mri	14	0	11	15	7	0
	Diagn Rx With Contrast Media	27	0	11	8	1	0

The table presents an extract from the catalogue of all the activities mapped and shows how many radiologists are professionals and what are the levels of competence in the most complex areas and therefore the most critical identified during the mapping, so it is necessary Intervene with improvement actions.

Table 2: Critical areas identified by the mapping of "clinical competence" at departmental level.

medicine and for the senology, the level of autonomy from medical personnel was found to be very homogeneous, presenting in both cases a widespread level 4. The group's analysis of the two operative units has also demonstrated groups of professionals stable enough for what may be possible movements for abandonment, long absences and/or transfers.

The situation was more articulated for radiology. Table 2 shows the distribution of autonomy levels for some performance/activity deemed more critical from the point of view of investment and human resource development. There was a serious criticality in the field of interventional radiology where only three physicians presented an operative competence with a degree of autonomy [3,4]. In the rest of the department no other doctor has adequate skills of interventional radiology. Another particularly critical area is pediatric radiology. In this case, the major competences are doctors coming to the abandonment for retirement in the course of the next five years.

Other critical issues have also emerged in the Neuro-radiological field in which only a few practitioners have demonstrated an enough degree of autonomy to conduct advanced neuro-radiological imaging investigations. A small group of physicians is growing in the field of cardio-imaging, which currently has a degree of basic autonomy that under the guidance of two supervisors (degree 5 of autonomy) is joining the group of consolidated experts (two physicians with grade 4).

Table 1 highlights other criticalities due to the establishment of the radiological group in the entire department, which shows that: 5 Medical executives and 4 directors of operational units will have to transmit their skills in the time frame of the next four years in anticipation of their abandonment for retirement. In the group there is a strong female component of which 40% of age less than 45 years and therefore subject to possible long absences during which it is necessary to maintain the acquired competences but also to guarantee the continuity of the performances. Also interesting is the number of young doctors residing outside the province that for various reasons could apply for mobility from hub structures to spoke structures and vice versa or could apply for mobility to approach the headquarters of Residence.

Discussion

The mapping of clinical competence provides a detailed picture of the distribution of autonomy levels on the individual activities offered by the operative units, in departmental optics [5]. It is therefore easy to identify the critical areas and the possible priorities of intervention in the coming years from the point of view of development or acquisition of competences. The analysis of the composition of the medical group must consider issues that may affect the distribution of competences and the stability of the teams and that must integrate the mapping of clinical competence. In particular, the factors to be considered are the ageing of staff and the balance between generations; the reconciliation of working life and private life; the planning of long absences; the company's ability to attract and retain professionals.

This provides a set of indicators, such as: number of persons who, on the basis of the data base, may abandon for retirement within the next 5 years, whose competences must be transmitted to the rest of the group, in accordance with a schedule; number of women under 45, who can therefore undergo a long absence to be managed to protect both the competences acquired by the person and organizational continuity; number of applications for mobility between hub-spoke structures; number of professionals residing outside the province. In line with the mapping of clinical competence, the evolution of medical

personnel in the Department must consider the main priority areas of intervention and related development actions. The different criticalities must include different solutions [6,7].

We propose the hypothesis of intervention in three areas considered critical: interventional Radiology, pediatric area and cardiac imaging with reference to cardiac resonance, which represent three different types of criticalities.

- 1) The major criticalities have been detected in the Interventionistic radiological field. In the whole department are only three professionals who deal with this method of which one growing and therefore considered insufficient to guarantee the volume of activity and especially the prompt availability for angiographic urgencies. The time factor is also critical for the acquisition and consolidation of competences in this area: the training course is in fact long, at least a year, and challenging from the organizational point of view since it cannot be carried out in the Office and that for Reaching certain thresholds of activity it is necessary to guarantee the participation/frequency of the professional also in external structures to the company.

The development actions therefore provide for: the targeted external recruitment, in collaboration with the School of specialization; a course of development in the field also with activities to be carried out outside the company structures; a continuous consolidation path through training and practice to ensure the attainment of the annual individual thresholds [2].

- 2) About the pediatric area, the diagnostic activities of conventional and contrast graphic radiology and second level ultrasound are currently guaranteed with a degree of autonomy advanced by personnel over the age of 50 years, represented by three physicians assumes abandonment for retirement in the next six years. It is therefore necessary both to strengthen the basic competences of the Group and to transform the pediatric diagnostics area into an investment field for some young people. In order to increase the attractiveness towards the young doctors, we should also strengthen the whole course of pediatric diagnosis and care by encouraging the participation of professionals in multidisciplinary meetings in the orthopedic, surgical and oncological fields, also in collaboration with medical personnel of nuclear medicine.

The improvement actions for this field provide for the reinforcement of the basic competences of the Group, through training and support of experts and moments of exchange of knowledge ad hoc between young people and experts. We expect to complete this reinforcement moment within the next two years.

- 3) The cardiac imaging activity is currently carried out by five radiologists, three of which belong to the hub structure and two to spoke structures, one of which is the higher proficiency (Grade 5: Supervisor and Tutor for the field training of new levers). The development of the activity is already in anticipation before it becomes a critical area. It is also foreseen a part of activity carried out in collaboration between radiology and nuclear medicine, transverse then to the department. The improvement actions in this area provide for external training for integrated diagnostics between radiology and nuclear medicine and the reinforcement of the group's basic competences, through training and coaching of experts.

In the short term, depending on the needs highlighted above, the actions undertaken were:

I) Realization in the current year of a training plan (internal and external) based on the analysis of the most critical competences and areas:

A) Departmental courses of pediatric radiology, neuroradiology, cardio radiology, magnetic resonance safety, and finally improvement courses in TC diagnostics have been provided to the definition of protocols for the internal formation Corporate shared;

B) In the form of external training, requests in line with the objectives of development of competences were met in priority.

II) Definition of intra-departmental and network working groups:

A) Activated Interhospital mobility Systems for the purpose of maintaining and improving skills in specific locations (e.g. for Cardio-RM) and not only for reasons of organic integration.

B) Definition of company standards for TC exams in election and emergency.

Conclusion

The management of the clinical competences focuses the systems and the tools that allow the Organization to detect the competences expressed by the professionals with respect to the expectations explained and at the same time to explain the expectations towards the different roles, In terms of objectives, including training and activities. Where strategies include the acquisition of people or the realization of development pathways, the departmental “Human resources Master Plan” becomes a new strategic trading tool with the company management.

The potential benefits are manifested against the professional who is satisfied to see that his desire for professional growth will be valued and will be able to document his experience gained during the training process. The operative units and the Department will be able to identify the criticalities in the distribution (current/prospective) of the competences required and to provide the training and development plans of the professionals or the acquisition of external resources. The entire company will finally be able to support organizational development activities based on objective surveys and concrete development projects.

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