ORIGINAL ARTICLE

Long term experience with a novel interventional cardiology network model: Learned lessons

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ABSTRACT

Objective: Many studies have assessed ischemic heart disease due to its high prevalence, secondary morbidities, high death rate, economic and social impact. We propose a novel model of intervention, the central objective of which is to guarantee the equal opportunity, avoiding patient transport and improving the use of resources assigned to cardiac care, ensuring patient safety and efficiency.

Methods: We projected a model in which interventional cardiologists based at a high-volume center (Madrid, Hospital Clínico San Carlos [HCSC]) established an alliance with two other hospitals (Leganés, Hospital Severo Ochoa [HSO] and Alcalá, Hospital Príncipe de Asturias [Hospital Príncipe de Asturias]), creating the opportunity to install a catheterization laboratory at each hospital (satellite units). We reviewed the clinical and economic long-term results, together with local hospital satisfaction levels.

Results: Between 2000 and 2014, 63,817 cardiac procedures: 54,516 at HCSC, 7,618 at HSO (since 2003) and 1,683 at HUPA (since 2012) were performed. Using a random sample obtained between 2011-2012 assessing 737 percutaneous coronary interventions (PCI) classified according to the patient's residence. No significant differences in bleedings during the first year (3.2% vs. 1.2%; $p = .29$), readmissions for a new myocardial infarction (5.7% vs. 3.5%; $p = .41$) or any-cause mortality (0.7% vs. 0%, $p = .418$)were observed. Subsequent scoring by professionals revealed both a high degree of satisfaction with the model and significant cost-savings implementing this network.

Conclusions: A network on interventional cardiology is a sustainable experience in our environment, offering a high standard of patient-centered care quality, as required by health authorities and national and international scientific-societies. It reduced costs, and was perceived with an excellent degree of satisfaction by professionals and managers of the peripheral centers.

Key Words: Patient centered care, Experience, network, Interventional cardiology

1. INTRODUCTION

Innumerable studies have and will continue to assess ischemic heart disease around the world, due to its known high incidence, prevalence, secondary morbidities, death rates, economic costs and social impact. For example, one recent registry from our country, collecting prospectively 2,557 consecutive patients with a suspected acute coronary syndrome from 43 randomly assigned hospitals, still demonstrates a considerable high mortality rate associated with this condition (in-hospital 4.1%, 6-month 3.8%) despite improved management strategies.[1]

Madrid, the area of influence of our center, has a population (2013) of 6,388,735 inhabitants, where according to the 2014

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national registry of Interventional Cardiology, coronary angiograms and percutaneous coronary interventions (PCI) are performed at a rate slightly above national average (2,592/million).[2] Interestingly, 25 out of 104 centers in this national registry were performing < 250 PCIs/year, mostly in the private sector, whereas just 18 were high-volume centers performing over a 1,000 PCIs/year. This is of paramount importance since numerous studies have suggested a direct and proportional relationship between clinical outcomes and volume of activity/experience.[3,4] As a consequence, the Spanish Ministry of Health, in collaboration with several Scientific Societies, developed a document of Standards and Recommendations on Cardiovascular Care together with a national strategy on ischemic cardiomyopathy.[5–7] Critically, these documents established a minimum volume of clinical activity for several specialized units, such as cardiac surgery, interventional cardiology and electrophysiology, in order to ensure the flow of patients required for medical teams to acquire and maintain clinical experience and guarantee safe and excellent assistance to the population as well as the efficient use of our public health system resources. Equally, the Spanish Society of Cardiology promotes a voluntary, but recommendable accreditation process for excellence in interventional cardiology practice.[8]

In the specific context of this work, Madrid is a very populous region with a fairly serious incidence and prevalence of coronary disease, often requiring urgent care that depends on high technology, expensive equipment together with a highly specialized healthcare team. In addition, the current economic circumstances and socio-demographic changes, demanding high quality and sustainable healthcare, should be taken into account.

Moreover, we believe that the Public Administration, executive management and even the public healthcare workers should take responsibility and actively drive and promote improvements in this field.

Since its inception in 1985, the Interventional Cardiology Unit at Hospital Clínico San Carlos (HCSC) has been characterized by a high volume of activity and expertise, pioneering in our country the diagnostic and therapeutic cardiac intervention procedures, being a reference unit for other centers, within and beyond the city. However, with the emergence of new interventional cardiology units all around the country and changes in healthcare management, our activity has progressively focused on the main hospital primary reference area, and including two nearby hospitals, Hospital Severo Ochoa in Leganés (HSO) located 20 km south from HCSC, and Hospital Príncipe de Asturias in Alcalá de Henares (HUPA), located 35 km west from HCSC. Considering the distance between these two peripheral hospitals and the reference center (HCSC), we projected a novel model of healthcare networking for percutaneous cardiac interventions through the installation of one catheterization laboratory in each of these two centers (HSO and HUPA), assisted by a unique medical team primarily based at the referral hospital (HCSC). Local nurses were trained at the reference center and then collaborated actively in the development of this project.

Hence, a skilled group of interventional cardiologists provide locally direct specialized care, in contrast to, the creation of smaller independent units (a common circumstance currently) would not ensure the efficiency and safety mentioned as part of the fundamental objectives of our public health service. Thus, our general objectives were firstly to guarantee the accessibility of care for all citizens in similar conditions (health equity), avoiding patient transports and improving the use of human resources and materials assigned to the healthcare service, and secondly maintaining the clinical activity volume needed to ensure patient safety and efficiency in resource use.

More specific objectives included:

- The application of the National/International Cardiovascular Care Standards and Recommendations by means of a healthcare network with satellite interventional cardiology units, the concentration of complexity cases in the referral hospital (i.e. chronic total occlusions, transcatheter aortic valve implantation and other cardiac structural interventions).
- Increase of professional and local provider satisfaction (cardiologists, intensive care physicians, internal medicine physicians, managers...), by involving them directly in the diagnostic and therapeutic decisions for their patients and incorporating the interventional procedure in the local hospital processes.
- Improvement in the overall health system efficiency by greatly reducing costs (mainly salaries, transport costs) reducing risk of patient transport, reducing family travel time, optimizing care administration timing, and improving the overall quality of care.

2. METHODS

In 2002, HCSC and HSO began to work on a document that would establish a strategic alliance between both centers, allowing for the installation of a catheterization laboratory (satellite unit) attended by HCSC interventional cardiologists. This project was granted by political authorities and initiated on 14^{th} May, 2003.[9] HCSC interventional cardiology worked at HSO with an allocation of four days a

week (the fifth day was destined to the electrophysiology unit: pacemaker implantation and electrophysiology studies), from 8 a.m. to 3 p.m. Eight years later, a similar project was established between HCSC and HUPA and was officially approved on February 2008.[10] Hence, we have assessed the model performance results through 31^{st} December 2014. The target population of this project consists of patients with a diagnosis or suspected ischemic heart disease, either acute or chronic, requiring invasive diagnostic or therapeutic procedures. Other patients needing invasive diagnostic procedures were included, for example, those about to undergo cardiac surgery (valvular, aortic, infective endocarditis, etc.), pulmonary hypertension or congenital heart disease, among others. The overall reference population for each one of these 3 centers is shown in Table 1, as previously reported.[11]

Table 1. Reference populations

	Populations
Clínico San Carlos Hospital	398,077
Severo Ochoa Hospital	189,543
Príncipe de Asturias Hospital	240,586
Total	828,206

To measure the achievement of our objectives we proposed the following main indicators, using as comparators the officially accepted standards, when feasible:

Descriptive:

- Number of catheterization laboratories by inhabitant.
- Number of procedures performed in interventional cardiology (each center and overall).
- Concentration of complexity in the referral hospital. Number of procedures performed by operator.

Efficacy and safety:

- Long term clinical results. We randomly selected a sample of patients who underwent a percutaneous coronary intervention. Patients were followed at office and by means of telephonic interviews. We compared them according to their city of residence.

Satisfaction Performance:

Efficacy and safety:

- Healthcare workers and management teams' satisfaction. The satisfaction levels, including different relevant aspects, were measured by anonymous questionnaires (scoring from 1 - very unsatisfied to 5 - very satisfied, see Table 2). The survey was conducted randomly among different professionals over various settings (attending physicians, fellows, nurses...) and specialties (cardiology, intensive care, internal medicine, health management...).

Efficiency, cost-effectiveness:

- Savings in healthcare-related transport. We estimated potential costs based on official tables of prices regarding saved transport procedures.
- Estimated wage savings on interventional cardiologists.

3. RESULTS

3.1 Procedures and accumulated experience: a descriptive analysis

Between January 1^{st} 2000 and December 31^{st} 2014, we performed 63,817 procedures (39,979 diagnostic, 23,833 therapeutic, 15,312 ad hoc therapeutic after a diagnostic procedure). Table 3 displays overall numbers per annum of patients with coronary artery disease final diagnosis. Table 4 depicts the total number of procedures, procedures adjusted by year and center. Table 5 shows a sample of complex procedures and their derivations to the main center.

Overall, 54,516 procedures were performed at HCSC (33,453 diagnostic, 21,063 therapeutic being 13,005 ad hoc therapeutic after a diagnostic procedure). In late 2003, we began to operate the Leganes' catheterization laboratory. Until 2014, 7,618 procedures were performed there (5,445 diagnostic, 2,173 therapeutic and 1,795 ad hoc therapeutic after a diagnostic procedure). HUPA's satellite laboratory began its activity in February 2012. Since then, 1,683 procedures were performed there (1,081 diagnostic, 602 therapeutic, 512 ad hoc therapeutic after a diagnostic procedure, see Table 6). Figure 1 depicts these numbers, disaggregated by year and hospital.

The model, interestingly, suggests that although most cases are locally resolved, we were able to concentrate the especially complex cases in a reference center (HCSC), with cardiac surgery in situ, and perform them after multidisciplinary discussion (Heart team) in a location with advanced instruments and the very same team of operators. These complex procedures are usually coded here as only therapeutic (left main, multivessel complex disease, rotablation procedures, structural heart procedures - ranscatheter aortic valve implantation [TAVI], congenital,..).

3.2 Model Safety and efficacy

Within a random sample obtained between 2011 and 2012 assessing 737 PCIs according to patient's area of residence, Madrid 652, Leganes 85, including stable and acute patients, after a mean of 26 months follow up, no significant differences in bleedings the first year (3.2% vs. 1.2%; $p = .29$), readmissions for a new myocardial infarction (5.7% vs. 3.5%; $p = .41$) or any cause mortality (0.7% vs. 0%, $p = .418$) were observed.

Table 2. Items included in the (anonymous) satisfaction survey

Survey to the management team (medical, nurses, others..)

1) How do you rate the care provided by Hospital XXXXX professionals in the Interventional Cardiology field? (1-5) About
   - Global
   - Delay
   - Information
   - Communication with professionals in your hospital
2) Point out what would you consider necessary to improve in relation to the care provided by the XXXX interventional cardiology unit.
   - From the perspective of hospital management:
3) What do you think about the availability in your hospital of the interventional cardiology unit?

(Aspects that can be put to value: attractiveness of the center, patient's perceived quality, professionals´ perceived quality, impact on hospital costs, impact on hospital activity, other?)

4) Please, point out the aspects, if any, do you consider beneficial for you hospital derived from the XXXX interventional cardiology unit local performance.
5) From the perspective of the Public Health Service:
   - What positive aspects can give to the health system this interventional cardiology network?
   - What negative aspects can give to the health system this interventional cardiology network?

Survey to the medical team

1) Specialty:
2) Seniority in the Hospital:
3) Has any of your patients been treated by the interventional cardiology unit of your hospital?

If yes, value of 1-5 the following aspects, whereas 1 means very dissatisfied and 5 very satisfied:

- Accessible
- Delay
- Participation in clinical decisions
- Information provided by the interventional cardiologist
- Clinical report.

4) Has any of your patients been referred to the XXXXX Hospital?

Reason:

- Complex coronary /structural intervention
- Complex arrhythmias
- Cardiac Surgery
- Other (specify)

If yes, value of 1-5 the following aspects, whereas 1 means very dissatisfied and 5 very satisfied:

- Participation in the decision
- Delay
- Information provided by the interventional cardiologist
- Clinical report

5) What do you think about the availability in your hospital of the interventional cardiology unit?

(Aspects that can be put to value: attractiveness of the center, patients perceived quality, perceived quality professionals, impact on hospital costs, impact on hospital activity, other?)

6) Please, point out the aspects, if any, do you consider beneficial for you hospital derived from the XXXX interventional cardiology unit local performance.
7) From the perspective of the Public Health Service:
   - What positive aspects can give to the health system this interventional cardiology network?
   - What negative aspects can give to the health system this interventional cardiology network?
8) Point out issues you consider necessary to improve in relation to the care provided by the XXXXX interventional cardiology unit.
9) What do you think about the possibility of performing joint meetings provided the communications infrastructure required?

Survey to the nursing team

6) Unit:
7) Seniority in the Hospital:
8) Has any of your patients been treated by the interventional cardiology unit of your hospital?

If yes, value of 1-5 the following aspects, whereas 1 means very dissatisfied and 5 very satisfied:

- Accessible
- Delay
- Participation in clinical decisions
- Information provided by the interventional cardiologist
- Clinical report.

9) Has any of your patients been referred to the XXXXX Hospital?

Reason:

- Complex coronary /structural intervention
- Complex arrhythmias
- Cardiac Surgery
- Other (specify)

If yes, value of 1-5 the following aspects, whereas 1 means very dissatisfied and 5 very satisfied:

- Participation in the decision
- Delay
- Information provided by the interventional cardiologist
- Clinical report

10) What do you think about the availability in your hospital of the interventional cardiology unit?

(Aspects that can be put to value: attractiveness of the center, patients perceived quality, perceived quality professionals, impact on hospital costs, impact on hospital activity, other?)

11) Please, point out the aspects, if any, do you consider beneficial for you hospital derived from the XXXX interventional cardiology unit local performance.
12) From the perspective of the Public Health Service:
   - What positive aspects can give to the health system this interventional cardiology network?
   - What negative aspects can give to the health system this interventional cardiology network?
13) Point out issues you consider necessary to improve in relation to the care provided by the XXXXX interventional cardiology unit.
14) What do you think about the possibility of performing joint meetings provided the communications infrastructure required?

Table 3. Overall patients with coronary artery disease per year

Coronary artery disease (all 3 hospitals)			
Year	No	Yes	Total
2000	919	3,443	4,362
2001	1,013	3,517	4,530
2002	952	3,669	4,621
2003	892	3,615	4,507
2004	951	3,923	4,874
2005	1,058	3,658	4,716
2006	888	3,657	4,545
2007	865	3,537	4,402
2008	848	3,399	4,247
2009	958	3,304	4,262
2010	925	3,424	4,349
2011	944	3,095	4,039
2012	957	2,661	3,618
2013	875	2,487	3,362
2014	895	2,488	3,383
Total	13,940	49,877	63,817

Table 4. Overall coronary artery procedures, stratified by center adjusted and mean per year

Procedures	Mean/year	Total
Overall (2000-2014)	4,255	63,817
Hcsc (2000-2014)	3,634	54,516
Hso (2004-2014)	693	7,618
Hupa (2012-2014)	561	1,683

Note. HCSC: Hospital Clínico San Carlos; HSO: Hospital Severo Ochoa; HUPA: Hospital Universitario Príncipe de Asturias

3.3 Peripheral hospital satisfaction performance levels

The results of the surveys carried out by professionals indicated a high degree of satisfaction with the proposed network model. Table 7 shows the average scores for each item. Table 1 encloses the survey.

3.4 Efficiency, cost-effectiveness from a social and Health system perspective

From the point of view of healthcare and consumable/implantable material cost of procedures, selection and acquisition of material and equipment is carried out centralized at the San Carlos Hospital, enabling volume purchases and best-price adjustments, not included in our analysis but probably significant. This strategy entails that, for the same procedure, there is no cost difference between those performed at the San Carlos (HCSC) or at the satellite units (HSO and HUPA).

Also, the implementation of this network impacts directly on reducing the number of medical transports of patients, relatives and caregivers, who otherwise would be moved to the San Carlos Hospital or other, as well as the social costs associated (timing-delays, cost of transportation, number of productive hours lost, distance…). Further studies have to be made in order to measure patient's satisfaction concerning medical performance under this network model comparing to either a reference-hospital model or independent medical-team pattern. On this point, we can estimate the economic impact of this reduction in medical transport, since most patients (except complex or surgery patients) did not finally need transport. Table 7 displays the charges associated with transport (official prices), from 2012. Other measurable issue would be the potential personnel savings. Taking into account official recommendations, a total of 12 interventional cardiologists would be necessary to man all the cath labs included in this study (HCSC, 3 cath labs and 24/7 primary angioplasty program; 6 cardiologists; HSO: 1 cath lab: 2 cardiologists; HUPA: 1 cath lab plus an additional 24/7 primary angioplasty program: 4 cardiologists).[5] Table 8 displays a potential added benefit derived from salary savings. Thus, our conservative estimate of savings exceeds 5,000,000 euros.

Table 5. Complex procedures. Origin (hospital were the angiographic diagnosis was made) and place of final performance

	Procedures	Number of patients
Chronic total oclusion[+]	**Diagnostic procedure**	
	HCSC	535
	HSO	246
	HUPA	221
	Therapeutic procedure	
	HCSC	915
	HSO	70
	HUPA	15
Rotational atherectomy	**Diagnostic procedure**	
	HCSC	323
	HSO	117
	HUPA	69
	Therapeutic procedure	
	HCSC	509
	HSO	0
	HUPA	0
Structural procedures	**Diagnostic procedure**	
	HCSC	901
	HSO	118
	HUPA	153
	Therapeutic procedure	
	HCSC	1,170
	HSO[£]	2
	HUPA	0

[+] Data from 2004; [£] Two aortic valvuloplasties performed because cardiogenic shock; HCSC: Hospital Clínico San Carlos; HSO: Hospital Severo Ochoa; HUPA: Hospital Universitario Príncipe de Asturias

4. DISCUSSION

The identification and examination of healthcare organizations provides an opportunity to characterize and disseminate strategies for improving quality. Despite that, less than 1% of the enormous national investment in medical research is

focused on improving healthcare delivery.[12]

Table 6. Satisfaction levels and its mean score (n = 35)

Varieties	Average score
Patients treated at the satellite unit	
• Ease for ordering the procedure	4.4
• Delay	4.42
• Participation in the decision	4.34
• Information provided by interventional cardiologist	4.42
• Clinical report	4.25
• Patient follow up	4.22
Referred patients to San Carlos Hospital	
• Overall	4.17
• Participation in the decision	4.02
• Delay	4.23
• Information provided by interventional cardiologist	4.02
• Accessibility and communication	4.02
• Clinical report	4.14
• Patient follow up	4.12
Impact of the satellite cath laboratory	
• Attractiveness of (local) hospital	4.38
• Quality perceived by patients	4.41
• Quality perceived by family	4.28
• Quality perceived by professionals	4.54
• Impact on local hospital costs	3.94
• Impact on local hospital activity	4.61

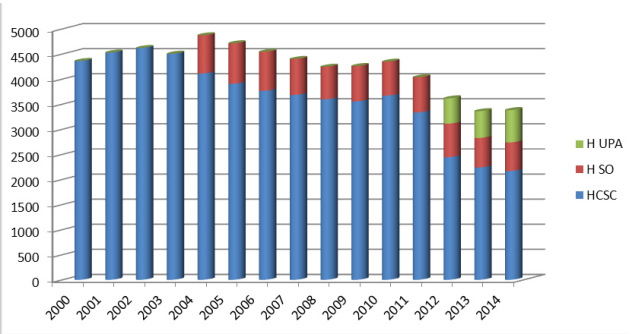

Figure 1. Procedures performed at each hospital by year
HCSC: Hospital Clínico San Carlos; HSO: Hospital Severo Ochoa HUPA: Hospital Universitario Príncipe de Asturias

Thus, in the present manuscript, we present our experience from a fully developed novel interventional cardiology network of three hospitals and one team, and critically analyze the achievement of the above-mentioned objectives, after several years of service.

Nevertheless, in view of these results, and from the perspective of our Ministry of Health Standards and Recommendations,[5] we report our compliance regarding center and operator activity (see Table 9). Over the total of activity performed at the peripheral hospitals, only about a 6% of patients were finally referred to San Carlos Hospital, because of a complex diagnostic/therapeutic procedure (even considering that all structural interventions, chronic total occlusions, etc. are performed there). However, we can see a slight decline in overall activity, in recent years that could be due to the huge increase in the number of centers with availability of interventional cardiology in our region. In spite of that, our model would maintain its levels of excellence. Moreover, after a limited experience with one peripheral center (HSO), the model's success led to its implementation for another hospital (HUPA), nine years later.

Table 7. Simplified cost estimates by annuities

Year	Medical transport (number)	Cost*
2012	1,172 × 2	626,434 €
2013	1,123 × 2	600,243.50 €
2014	1,213 × 2	648,348.50 €
Total	7,016	1,875,026 €

* Cost/ urgent intercity health transport (urgent unassisted -no physician-ambulance: 232€+1.41€/Km. For practical purposes we considered an average distance 25km and thus a 267.25 €/transport, since the shortest route by motorway to Leganes is 20.5 Km (HSO) and to Alcalá is 34.7km (HUPA). A patient with a heart attack or other acute cardiac condition would probably require a mobile ICU, a much more expensive transfer) as reflected in Madrid public prices list[21]. We did not considered the waiting time (48 €/ hour) or only one-way transfers, more likely in sickest patients that would usually require more expensive transportation

Table 8. Estimated personnel costs savings

Year	Estimated cost/person-year*	Total
2012	250,000 € × 4	1,000,000 €
2013	250,000 € × 4	1,000,000 €
2014	250,000 € × 4	1,000,000 €
Total	250,000 € × 12	4,000,000 €

* This value would vary between systems (public/private), geographic areas and professional qualification, shifts, etc... Thus, we selected an approximate estimated overall value (direct and indirect)

On satisfaction grounds, the results can be explained by different reasons: apart from the logical prestige that it brings to the hospital to expand its portfolio services, we need to consider the scientific enrichment of having highly skilled operators at local level together with the possibilities of growth and development for the departments more directly involved themselves (i.e. interventional cardiology is a criteria needed to get a cardiology fellowship program and supports). Analysis like this would allow for internal benchmarking over time, that hopefully could be useful to detect how the service or specific aspects of the model have changed.

We considered as "efficiency" the achievement of the objectives of the National Health System (care, teach and research), and specifically Madrid's system, making the best use of available resources, within a framework of equity, quality and security to ensure the best assistance possible to citizens. Thus, on the one hand, we need to maintain the overall procedure volumes to guarantee a minimum oper-

ator/center volume, with adequate equipment (expensive), since as previous studies and guidelines point out, clear morbidity and mortality advantages,[3–5, 11, 13, 14] and optimizing the procedures associated with these treatments, performed by a team with experience, able to implement a more reasonable use of our limited resources. Several studies have reported inter-hospital performance differences.[15–20] In this sense, an adequate strategy like we propose here, would probably improve results in some hospitals.

Table 9. Official Standards and Recommendations (Ministry of Health, 2011[5]) and the net numbers

	Standards and Recommendations	San Carlos Network model
Epidemiological estimations/features	2,997 Diagnostic procedures/million inhabitants/year	2,934 Diagnostic procedures/million inhabitants/year
	1,373 Therapeutic procedures/million inhabitants/year	1,311 Therapeutic procedures/million inhabitants/year
	258 Primary PCIs/million inhabitants/year	281 Primary PCIs / million inhabitants/year
Reference population	1 Interventional Cardiology Unit/million inhabitants	1 Interventional Cardiology Unit /≈ 800,000 inhabitants
	1 catheterization laboratory/400,000 inhabitants	1 catheterization laboratory/400,000 inhabitants
Procedures recommended	> 500 Diagnostic procedures /year	Yes
	> 400 Therapeutic procedures /year	Yes
	Procedures performed for, at least, 2 certified interventional cardiologists (at least 75 PCIs /year each)	8 interventional cardiologists (i.e. 2014: 1224 PCIs, 153 PCIs/operator)

On the other hand, the quality of care is closely related to the interventional cardiology's group together with other related highly specialized units, such as those located within the San Carlos Hospital: clinical units, heart failure, advanced cardiovascular imaging, electrophysiology, cardiac and vascular surgery, for instance.

This intercenter multidisciplinary professional collaboration allows patients and local physicians to get a comprehensive and thorough analysis for the most complex conditions, promptly studied and discussed in the referral hospital. The alternative of creating independent interventional cardiology units in small or middle-sized peripheral hospitals, with reference areas about 300,000 people, would probably not reach the recommended standards, requiring at least 2-3 (only 1 shift) or 4 physicians (24/7 schedule) at each lab. Furthermore, the integration of our network in the regional infarction code (Madrid public net primary PCI program), would increase the numbers of staff needed to man the laboratories, with subsequent costs. In addition, Table 6 clearly displays transport derived savings.

In view of these long-term results, we feel that the satellite interventional cardiology units establishment, as shown, is a successful model for patient care, related professionals and the health system itself, suggesting its sustainability over time. Thus, this care network was able to:

- Provide immediate quality assistance to peripheral hospital patients (in different cities) with a single medical team, concentrating experience.
- Perform complex interventional (i.e. electrophysiology or cardiac surgery) procedures, so that citizens receive state of the art cardiovascular care, according with the official Standards (as management and national and international scientific societies proposed).
- Using available resources efficiently, saving costs and maximizing the capacity acquired by the staff, who bring their knowledge and experience to smaller centers with lower volume.

Thus, this networking experience among professionals from different centers could make a basis on which to formalize a genuine care network between hospital and general practice centers, where they could produce robust care trajectories for different concrete pathologies.

With the necessary adaptations to an individual case, this network model could probably be successfully extrapolated for other healthcare settings, outside the region of Madrid.

5. Conclusions

A network on interventional cardiology is a sustainable experience in our environment, allowing for a high standard of patient-centered care quality, appropriate to the requirements set out by health authorities and the national and international scientific societies. The network system reduced costs, and received an excellent degree of satisfaction among professionals and managers of the peripheral centers where the satellite catheterization laboratories network are located.

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Conflicts of Interest Disclosure

The authors declare they have no conflict of interest.

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