

A Paediatric Day Surgery Unit: Costs and Outcomes

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Abstract

Aim: To access the effectiveness, safety and benefits to the child and the family of a paediatric day surgery programme in the “Agia Sofia” Children’s Hospital, the biggest paediatric hospital in Greece.

Methods: Data from the paediatric day surgery unit during 2016 were recorded and included the number and type of surgical procedures, the unplanned overnight admission rate and the financial income and costs.

Results: The number of children treated during 2016 in the “Agia Sofia” Children’s Hospital day surgery unit was 1785. The majority of children were between 2 and 7 years of age. Otorhinolaryngologic procedures

Keywords: Ambulatory surgery, economic outcomes, income, cost, children.

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were the commonest, followed by general surgical procedures. The most common procedures were adenoidectomy, tonsillectomy, gastroscopy, circumcision and myringotomy. The frequency of unplanned admissions following day surgery was very high but was the result of inappropriate use of the day surgery unit. A financial evaluation demonstrated the cost-effectiveness of Children’s Day Surgery.

Conclusion: Paediatric day surgery is a cost-effective programme benefitting the child, the family and the hospital itself.

Introduction

Dedicated paediatric day-surgery units have expanded worldwide during the last decade. Children are excellent candidates for ambulatory surgery because they are usually healthy and the surgical procedures are simple, predictable and of short duration [1]. The proportion of elective paediatric cases which can be treated in a day-surgery unit accounts for up to 80% of all paediatric surgery. The well-recognised advantages for paediatric day surgery are: a) less time away from home, since the young patients can rest on their own bed during the night of the surgical procedure, b) reduced hospital costs, c) fewer staff required, d) reduced hospital infections [2].

Day surgery (and moreover paediatric day-surgery) is a recently introduced concept in Greece. Under the current conditions of austerity and fiscal pressures, funding of the National Health System is constantly decreasing. The criteria for the introduction of new health care programmes includes cost-effectiveness. If day-surgery units can reduce hospital costs, thereby reducing the budget for health services, they will increase in number in Greek hospitals. On the other hand, the target of every health programme should also include patient satisfaction and both factors should be kept in mind when planning the health service of the future.

The Paediatric Day-Surgery Unit at the “Agia Sofia” Children’s Hospital is a self-contained unit within the main hospital with a floor space of 560m², and operating totally independently from the rest of the hospital.

Through this study we tried to access the efficacy, effectiveness and safety of a paediatric day surgery programme and its benefit to the child and the family, and in addition, evaluate the economic benefits to the hospital.

Methods

The day-surgery programme at the “Agia Sofia” Children’s Hospital, Athens, Greece, was assessed throughout the calendar year 2016. During this year, the medical records were handwritten and collection

of data (number and type of different surgical procedures) was time-consuming. Relevant financial income was calculated using DRGs, combining data on quantities of different surgical procedures and their prices. To calculate costs, the paediatric day-surgery unit was considered as a cost centre, using as cost-driver the percentage of floor space of the hospital occupied by the day surgery unit [3]. Frequency of unplanned admissions following day surgery was also noted.

Results

The number of children treated during 2016 in the “Agia Sofia” Children’s Hospital ambulatory day-surgery program was 1785 (Fig. 1).

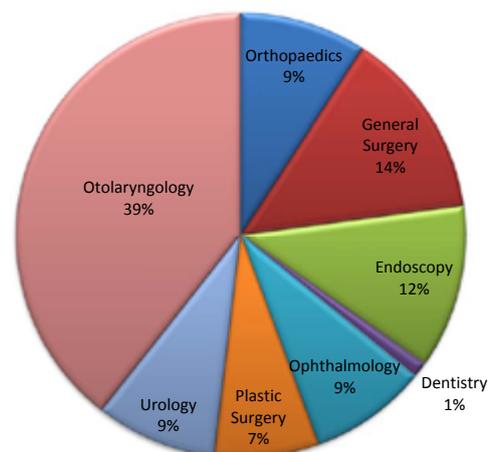


Figure 1 Children Treated in the Ambulatory Day Surgery Programme at the “Agia Sofia” Children’s Hospital, by Service, during 2016.

Otolaryngologic surgery accounts for almost 40% of activity in the day-surgery programme, with tonsillectomy and adenoidectomy the most commonly performed operation in this group. General surgery procedures comprise almost 14% of activity with hernia repair the most prevalent. Endoscopy contributes nearly 12% of activity while

circumcision is the most common of the 9% of urological procedures. The number of individual procedures is shown in Table 1.

Table 1 Individual Procedures.

Procedure	No of Patients
Adenoidectomy	498
Tonsillectomy	417
Gastroscopy	180
Circumcision	151
Myringotomy	142
Tubes	115
Colonoscopy	92
Hernia repair	85
Excision of skin lesion	70
Nasolacrimal duct procedures	42

The ages of children treated in the day surgery program are shown in Figure 2. The majority of children (58%) were between 1 and 7 years old. The financial income of the Ambulatory Day Surgery Programme, by Service, is shown in Table 2. The costs of Day Surgery Unit, both direct and indirect, are shown at Table 3.

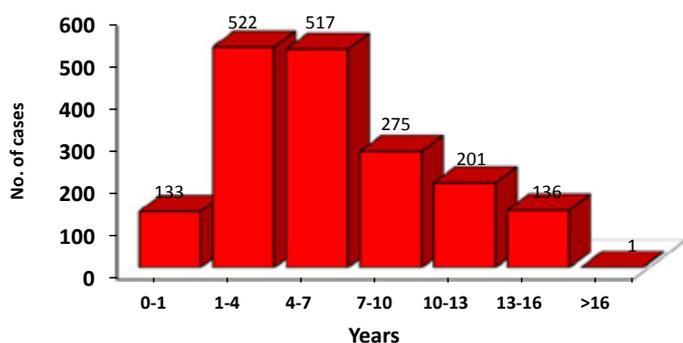


Figure 2 Age range of children treated in "Agia Sofia" Children's Hospital Day-Surgery Unit during 2016.

Table 2 The financial income of the Ambulatory Day Surgery Program at "Agia Sofia" Children's Hospital, by Service, during 2016.

Service	Income (€)	Percent
Otolaryngology	163219	43.52
Urology	28857	7.69
Plastic Surgery	21499	5.73
Ophthalmology	20849	5.56
Dentistry	1640	0.44
Endoscopy	36266	9.67
General Surgery	73294	19.54
Orthopaedics	29392	7.84
Total	375016	100

Table 3 The costs of the Ambulatory Day Surgery Programme at "Agia Sofia" Children's Hospital, during 2016.

Direct cost (€)	Indirect cost (€)	Total (€)
137,456.93	36,301.83	173,758.76

Unplanned admissions to Hospital from the Day Surgery Unit are listed in Table 4.

Table 4 Unplanned admissions to the Hospital from the Day-Surgery Unit at "Agia Sofia" Children's Hospital, Athens, during 2016.

Service	Unplanned admissions	No. of cases	Percentage
Otolaryngology	109	703	15.50%
Urology	74	156	47.44%
Plastic Surgery	2	134	1.49%
Ophthalmology	15	152	9.87%
Dentistry	8	19	42.11%
Endoscopy	213	213	100.00%
General Surgery	8	245	3.27%
Orthopaedics	25	163	15.34%
Total	454	1785	25.43%

Discussion

The income of "Agia Sofia" Children's Hospital from the function of the Paediatric Day-Surgery Unit during 2016 was €375,016. The relevant cost was €173758.76. This means that there is net 'profit' of €201257.24. The ratio Income/Cost is 2.16. Wage costs are not included in the Greek DRGs [4]. There is no doubt that Paediatric Day-Surgery Unit provides income for the "Agia Sofia" Children's Hospital. The proportion of children suitable for day-case surgery varies by specialty and case mix but in general accounts for 50-70% of the elective paediatric surgical workload in a specialist centre and up to 80% in a district general hospital [2]. Although the day-surgery programme is cost-effective, the real saving comes from the closure of unused beds. Empty beds attract a service cost that reduces the potential savings [5]. However, bed closure is not part of Greek mentality.

Staffing level of a day-surgery unit is controversial. In the United Kingdom, it ranges from 0.2 to 3.2 whole time equivalent (WTE) staff for each staffed bed, chair or trolley. Personnel include nurses, porters, operating department practitioners and assistants, housekeepers, administrative and clerical staff, while medical staff are excluded [6]. At the paediatric day-surgery unit of "Agia Sofia" Children's Hospital there are twelve nurses for two staffed beds. This is a high staffing level and may be excessive. Reduction of staffing level, but within safe limitations could maximise the 'profit' from the day-surgery unit without affecting performance.

The majority of children treated in the paediatric day-surgery unit were between 1 and 7 years. This is in accordance with other studies [1]. The most frequently used services were Otolaryngology, General Surgery and Endoscopy. These three services are also the most profitable services with the Otolaryngology service responsible for almost 44% of the total income of the paediatric day-surgery unit.

The number of unplanned admissions to hospital following day surgery has been reported to range from 0.1% to 5.3% [7-13]. In our unit, the unplanned overnight admission rate was 25.43% during 2016. This number is quite high. Although there is no data for

the unplanned admissions, there are two reasons for this very high frequency.

Paediatric day-surgery unit is an Autonomous Unit located within “Agia Sofia” Children’s Hospital. However, operating time in the main hospital operating rooms is insufficient to deliver the routine workload due to lack of nursing staff. Therefore the day-surgery unit is used as an additional facility for more major non-ambulatory operations. Because of this “inappropriate” use of day-surgery unit, young patients need post-operative hospitalization, hence the frequency of overnight admission in Otolaryngology, Urology, Ophthalmology, Dentistry and Orthopaedics services is high. In contrast, endoscopy services serve children already hospitalized in a paediatric ward for a major problem requiring colonoscopy or gastroscopy. Therefore children requiring endoscopy services are all already pre-admitted to the hospital (100%).

The second reason is that “Agia Sofia” Children’s Hospital is a tertiary hospital, which serves the whole country. There are many children who come from islands or cities far away from Athens. If the family has to travel for more than an hour on the way back home, overnight recovery after ambulatory surgery is preferred. All these children are hospitalized for one night. Many countries are promoting Medi Hotels. These are hotels close to the hospitals, where the patient is supposed to have the same facilities and staffing as in an ordinary hotel but there are better facilities for handling unanticipated medical problems [14-16]. Unfortunately, such hotels have not yet been developed in Greece.

By reducing the unplanned and the pre-planned admissions after day-surgery, the cost-effectiveness of such a programme may further improve. Despite these disadvantages, paediatric day-surgery is a cost-effective programme benefitting the child, the family and the hospital itself.

The protocol of this study has been approved by the ethical committee of the “Agia Sofia” Children’s Hospital.

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