

Cost Savings of In-Office Pulsed Dye Laser Treatment of Port-Wine Birthmarks Without General Anesthesia

Port-wine birthmarks (PWB) are capillary malformations that affect nearly 0.5% of newborns. Without treatment, PWB often progress from flat lesions into irregularly thickened plaques with nodules, which can lead to significant psychologic morbidity in children.¹ With the advent of the pulse-dye laser (PDL), physicians have been able to selectively target vascular lesions for treatment and achieve clearance of PWB before patients reach school age. However, a recent FDA warning has raised concerns with the repeated use of general anesthesia in children younger than 3 years, which is often required for children unable to tolerate PDL treatment. Physicians have recently advocated for as early treatment of PWB as possible in infants 1 year or younger in the office setting without general anesthesia, which has been shown to be both highly safe and effective.²⁻⁴ With more attention now on health care costs, we compare the cost-effectiveness of PWB treatment based on clinical setting and use of anesthesia.

A cost analysis was performed for PDL treatment of PWB by clinical setting. Costs were compared for in-office treatment without anesthesia, in-office treatment with intravenous sedation, and operating room treatment with general anesthesia using sample cases at our private practice clinic (Laser & Skin Surgery Center of New York, New York, NY). Office and operating room supplies included the use of consumables, such as examination gloves and gauze sponges. The anesthesiologist fee included intravenous fluids, medications, and medical supplies. The facility fee covered the operating room and recovery room expenses. The reimbursement rates for PDL treatment of PWB were determined to be the mean amount of 4 commonly encountered health insurance providers for our clinic. The reimbursement differed if performed either in the office or hospital facility. The reimbursement rate was dependent on PWB size: less than 10 cm² (17106), 10 to 50 cm² (17107), and greater than 50 cm² (17108).

The cost to treat PWB varied depending on the clinical setting. For in-office treatment without anesthesia, the total cost was \$530.36 (17106), \$684.95 (17107), and \$996.92 (17108) (Table 1). For in-office treatment with intravenous sedation, the total cost was \$1,130.56 (17106), \$1,285.15 (17107), and \$1,597.12 (17108) (Table 1). For operating room treatment with general anesthesia, the total cost was \$3,730.38 (17106), \$3,827.36 (17107), and \$4,069.70 (17108) (Table 1).

Treating PWB in the office without anesthesia reduced costs by \$600.20 (Δ -53.1%) (17106), \$600.20 (Δ -46.7%) (17107), and \$600.20 (Δ -37.6%) (17108) compared with intravenous sedation. The cost savings increased to \$3,200.02 (Δ -85.8%) (17106), \$3,142.41 (Δ -82.1%) (17107), and \$3,072.78 (Δ -75.5%) (17108) when compared with treating in the operating room with general anesthesia.

Studies have previously demonstrated that PDL treatment of PWB in infants younger than 1 year without general anesthesia can achieve impressive clinical outcomes while maintaining excellent safety profiles.²⁻⁴ Topical anesthesia can generally be used after the age of 1 year but may be associated with unnecessary risk given available conflicting reports. Without supplemental intervention in our clinic, we have found that infants may be unhappy during and immediately after PDL treatment, but they can be easily soothed and return back to their baseline within minutes after the treatment. Oral sucrose, breast-feeding, and bottle feeding can be used post-treatment to help with infant soothing.

In 2016, the FDA warned that “repeated or lengthy use of general anesthetic and sedation drugs during surgeries or procedures in children younger than 3 years...may affect the development of children’s brains.” Several studies involving animals and children were cited, including findings that animals demonstrated subsequent widespread loss of nerve cells in the brain. Given the recent and highly publicized warning by the FDA regarding potentially harmful consequences of repetitive exposure to general anesthesia on infant brain development, physicians should be even more exceedingly cautious in exposing young pediatric patients to unnecessary and undue risks from anesthesia and sedation.⁵

Another concerning variable in the global discussion of treatment is the overall cost to the health care system. Our study highlights significant differences in treatment costs based on the clinical setting and decision to use anesthesia or sedation. The choice to perform PDL treatment of PWB in the outpatient setting without any anesthesia instead of in the operating room with general anesthesia translated to more than \$3,000 in cost savings per treatment session. This forecasts to total cost savings of more than \$18,000 to \$24,000 with a typical treatment plan that incorporates 6 to 8 treatment sessions. Lowering the costs of treatment can help various involved parties, including the patient, family, physicians, clinics, hospitals, health care systems, and

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TABLE 1. Costs for Treatment of Port-Wine Birthmark in Office Without Anesthesia, in Office With Intravenous Sedation, and in Operating Room With General Anesthesia Sorted by Billing Code

Consumables and Services	17106	17107	17108
In office without anesthesia			
Office supplies	\$ 0.85	\$ 0.85	\$ 0.85
Examination gloves			
Gauze sponges			
Laser charge reimbursement	\$ 529.51	\$ 684.10	\$ 996.07
Total cost	\$ 530.36	\$ 684.95	\$ 996.92
In office with intravenous sedation			
Office supplies	\$ 1.05	\$ 1.05	\$ 1.05
Examination gloves			
Gauze sponges			
Laser charge reimbursement	\$ 529.51	\$ 684.10	\$ 996.07
Anesthesiologist fee	\$ 600.00	\$ 600.00	\$ 600.00
Intravenous fluids			
Drugs			
Supplies			
Total cost	\$ 1,130.56	\$ 1,285.15	\$ 1,597.12
In operating room with general anesthesia			
Operating room supplies	\$ 7.04	\$ 7.04	\$ 7.04
Examination gloves			
Gauze sponges			
Laser charge reimbursement	\$ 327.48	\$ 424.46	\$ 666.80
Anesthesiologist fee	\$ 1,728.00	\$ 1,728.00	\$ 1,728.00
Intravenous fluids			
Drugs			
Supplies			
Facility fee	\$ 1,667.86	\$ 1,667.86	\$ 1,667.86
Operating room			
Recovery room			
Total cost	\$ 3,730.38	\$ 3,827.36	\$ 4,069.70

insurance providers. Physicians should more accurately weigh the overall costs, risks, and benefits when deciding how to treat every dermatologic condition.

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