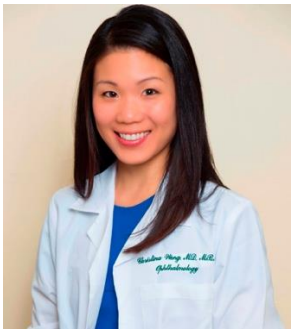
Process Mapping and Activity Based Costing of the Intravitreal Injection Procedure



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OBJECTIVE To quantify the cost of performing an intravitreal injection in an outpatient setting based on time, activity, and resources.

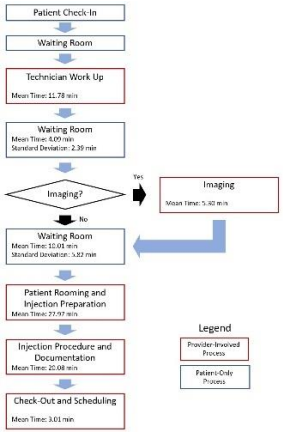
PURPOSE Intravitreal injections (IVI) represent the most common procedure performed by retina specialists today, yet the actual cost of performing IVIs is not fully understood when one takes into account the operational flow, resources, and personnel involved. An observational cost analysis study was performed to quantify the average cost of an IVI procedure, independent of the drug injected.

METHODS The study design is an observation cost analysis based on activity-based costing, an accounting method which allocates a cost to each component on a process map. Cost pools (CP) were divided by their practical capacity (PC), then multiplied by an activity rate (AR). 14 patients were observed at an academic center retina clinic to develop an IVI process map (PM). Direct material, employee, and overhead costs were determined by a combination of internal records and national reported averages. The calculated cost was benchmarked against the reimbursement revenue drawn from the Centers for Medicare & Medicaid Services Fee Schedule for HCPCS 67028: Injection eye drug.

RESULTS Process mapping (Figure 1) found that, on average, 11.78 minutes (min) were spent on technician work-up, 5.30 min were spent on imaging, 27.97 min were spent on in-room waiting and injection preparation, 20.08 min were spent on the injection delivery and associated documentation, and 3.01 min were spent on check-out and scheduling. Interestingly, more retina specialist labor time was spent on EHR documentation (μ=6.68 min, SD=1.80 min) than patient greeting (μ=3.49 min, SD=1.97 min) or the injection itself (μ=2.34 min, SD=0.67 min).The average direct material, direct labor, and overhead costs per IVI procedure were

$0.15, $80.04, and $53.01, respectively (Figure 2). 2018 Medicare reimbursement for an IVI procedure is $104.40, netting a gross margin of -$28.79 (-27.6%). The largest indirect costs were rent ($24.46), electronic health record (EHR) fees ($10.76), and billing/coding fees ($10.44). The largest direct cost was ophthalmologist labor ($62.35, 95% CI=19.02-105.67).

CONCLUSION The negative gross cost margin found suggests that intravitreal injections may not be appropriately valued by payors. The cost drivers identified here imply that larger practices may possess a profitability advantage by distributing overhead costs over a larger patient pool. Further study is warranted to identify targets for cost reduction without compromising quality of care or patient safety.



Process map components and time allocations for the intravitreal injection procedure

Average Gross Margin for an Intravitreal Injection

Cost Statement Under Activity-Based Costing

	Subtotal ($)	Total ($)
Direct Materials		0.15
Proparacaine	0.08	
Providone iodine (bottle)	0.02	
Providone iodine (swabs)	0.01	
Tissues	0.02	
Eye wash	0.01	
Direct Labor		80.04
Retina Ophthalmologist	62.35	
Technician	9.60	
Receptionist	1.00	
Drug Manager	7.09	
Overhead		53.01
Equipment Sterilization	0.58	
EHR Software	10.76	
Billing System	10.44	
Billing Employee	0.63	
Security	0.44	
Cusodial Staff	0.42	
Rent	26.46	
Water	0.04	
Electricity	1.76	
Internet	1.47	
Total Cost		$ 133.19

Income Statement

	Subtotal ($)	Total ($)
Revenue		$ 104.40
CPT 67028 Reimbursement	104.40	
Cost of Goods Sold		$(133.19)
Direct Materials	(0.15)	
Direct Labor	(80.04)	
Overhead	(53.01)	
Gross Margin		$ (28.79)
Gross Margin Percentage		-27.6%

Activity-based cost calculations associated with an intravitreal injection procedure

HUMAN RESEARCH Yes: Approved by institutional review board