

Supplementary Online Content

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eTable 1. Survey Instrument Administered to Emergency Departments

eTable 2. Factors Affecting Perception of the Value of Teleophthalmology for Patient Triage and Full Consultation

This supplementary material has been provided by the authors to give readers additional information about their work.

eTable 1. Survey Instrument Administered to Emergency Departments

Characteristic	Possible Responses (Units)
<u>Part 1 – Emergency Department Characteristics (Collected from Nurse Managers)</u>	
Telemedicine utilization by hospital	Yes/No
Number of ophthalmologists at hospital	(Number of ophthalmologists)
Number of ophthalmologists available during hospital operating hours	(Number of ophthalmologists)
Number of ophthalmologists available after hospital operating hours	(Number of ophthalmologists)
Availability of ophthalmologist exam immediately following emergency consultation	Yes/No
Average time before transfer to referral	(Hours)
Distance between facility and referral location	(Miles)
Any emergency eye encounter(s) recalled in 2014	Yes/No
Any emergency eye encounter(s) recalled in 2013	Yes/No
Any patient(s) presenting with an emergency eye problem who had to be transferred in 2014	Yes/No
Any patient(s) presenting with an emergency eye problem who had to be transferred in 2014	Yes/No
<u>Part 2 – Perceived Value of Teleophthalmology (Collected from Nurse Managers and Physicians)</u>	
Perceived value of teleophthalmology for triage	1-5 Scale: 1 = very low value, 5 = very high value
Perceived value of teleophthalmology for full remote consultation	1-5 Scale: 1 = very low value, 5 = very high value
Pro(s) affecting perceived value	see Table 4

Con(s) affecting perceived value	see Table 4
Fair price for teleophthalmology compared to current on-call ophthalmologist wages	Less than, Equal to, or More than current on-call ophthalmologist wages
Main reason why the emergency department does not use emergency teleophthalmology	see Table 4 (cons)

eTable 2. Factors Affecting Perception of the Value of Teleophthalmology for Patient Triage and Full Consultation

	Value of Teleophthalmology for Patient Triage ¹		Value of Teleophthalmology for Full Consultation ²	
	<u>All Facilities</u>	<u>Rural Facilities</u>	<u>All Facilities</u>	<u>Rural Facilities</u>
	β Coefficient (SE)	β Coefficient (SE)	β Coefficient (SE)	β Coefficient (SE)
Nurse Managers				
<i>Pros of Emergency Teleophthalmology</i>				
Could increase facility's existing on-call ophthalmology coverage	0.42 (0.12) ***	0.45 (0.45)	0.54 (0.13) ***	0.33 (0.39)
Could provide new coverage since facility does not have on-call ophthalmologists	0.71 (0.13) ***	0.85 (0.48) .	0.80 (0.14) ***	0.59 (0.42)
Immediate electronic sending and response	0.27 (0.13) .	-0.10 (0.51)	0.62 (0.14) ***	0.57 (0.44)
Could make triage more efficient	0.97 (0.17) ***	-0.33 (0.55)	0.48 (0.19) *	-0.71 (0.47)
Could help increase patient interest and attract patients to the facility	0.47 (0.12) ***	0.45 (0.32)	0.43 (0.13) ***	0.46 (0.28)
Could provide helpful second opinions to existing emergency staff	0.29 (0.13) .	0.40 (0.41)	0.31 (0.14) *	0.43 (0.36)
Hospital has had positive experiences with other telemedicine programs	0.46 (0.10) ***	0.69 (0.29) *	0.44 (0.11) ***	0.58 (0.25) *

<i>Cons of Emergency Teleophthalmology</i>				
Could be less efficient than existing on-call ophthalmologists	-0.36 (0.11) ***	0.41 (0.47)	-0.35 (0.12) **	0.66 (0.41)
The emergency department's existing referral system is already efficient enough	-0.43 (0.11) ***	-0.40 (0.40)	-0.44 (0.12) ***	-0.59 (0.34) .
Could negatively impact patients since they cannot directly see the remote ophthalmologist	-0.24 (0.09) **	-0.04 (0.31)	-0.27 (0.10) **	-0.39 (0.27)
Emergency eye trauma could make images less conclusive in remote consultation	-0.09 (0.09)	0.08 (0.32)	-0.21 (0.10) *	0.24 (0.28)
Unknown cost of installation, maintenance, and contracting payments to teleophthalmologist(s)	-0.54 (0.14) ***	-0.74 (0.43) .	-0.57 (0.15) ***	-0.64 (0.38) .
Could be dependent upon electricity and internet availability; not always available	-0.09 (0.10)	-0.19 (0.37)	-0.01 (0.11)	-0.40 (0.32)
Hospital has had negative experiences with other telemedicine programs	-1.03 (0.26) ***	0.08 (0.67)	-0.76 (0.28) **	0.26 (0.58)
Physicians				
<i>Pros of Emergency Teleophthalmology</i>				
Could increase facility's existing on-call ophthalmology coverage	0.92 (0.13) **	0.44 (0.35)	0.94 (0.13) ***	0.38 (0.34)

Could provide new coverage since facility does not have on-call ophthalmologists	0.99 (0.12) ***	0.81 (0.39) .	0.99 (0.12) ***	0.89 (0.38) *
Immediate electronic sending and response	0.44 (0.12) ***	0.52 (0.34)	0.47 (0.11) ***	0.65 (0.33) .
Could make triage more efficient	0.60 (0.12) ***	-0.12 (0.39)	0.63 (0.11) ***	0.46 (0.38)
Could help increase patient interest and attract patients to the facility	0.59 (0.11) ***	0.35 (0.33)	0.55 (0.11) ***	0.71 (0.32) *
Could provide helpful second opinions to existing emergency staff	0.70 (0.11) ***	0.70 (0.37) .	0.67 (0.11) ***	0.50 (0.35)
Hospital has had positive experiences with other telemedicine programs	0.52 (0.15) ***	-0.11 (0.40)	0.58 (0.14) ***	0.11 (0.39)
<i>Cons of Emergency Teleophthalmology</i>				
Could be less efficient than existing on-call ophthalmologists	-0.48 (0.13) ***	0.13 (0.33)	-0.48 (0.12) ***	-0.09 (0.32)
The emergency department's existing referral system is already efficient enough	-0.61 (0.15) ***	-0.46 (0.45)	-0.60 (0.15) ***	-0.51 (0.43)
Could negatively impact patients since they cannot directly see the remote ophthalmologist	-0.56 (0.12) ***	-0.68 (0.30) *	-0.55 (0.11) ***	-0.61 (0.29)
Emergency eye trauma could make images less conclusive in remote consultation	-0.21 (0.11) .	-0.66 (0.35) .	-0.25 (0.11) *	-0.68 (0.34)
Unknown cost of installation,	-0.42 (0.14) **	-0.92 (0.36) *	-0.32 (0.13) *	-0.68 (0.34) .

maintenance, and contracting payments to teleophthalmologist(s)				
Could be dependent upon electricity and internet availability; not always available	-0.37 (0.18) *	-0.31 (0.39)	-0.44 (0.17) *	-0.50 (0.38) .
Hospital has had negative experiences with other telemedicine programs	null	null	null	null

Results obtained via multivariable linear regression analysis. Statistical Significance: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 '.' 1

1. Nurse manager assessment of teleophthalmology for patient triage:

“All Facilities”: (1) Estimated intercept = 3.09***; (2) Residual standard error = 0.66, on 239 degrees of freedom; (3) Multiple R-squared = 0.63; (4) Adjusted R-squared = 0.61; (5) F-statistic = 29.1, on 14 and 239 degrees of freedom; (6) p-value < 2.2e-16

“Rural Facilities”: (1) Estimated intercept = 4.32***; (2) Residual standard error = 0.79, on 28 degrees of freedom; (3) Multiple R-squared = 0.46; (4) Adjusted R-squared = 0.19; (5) F-statistic = 1.74, on 14 and 28 degrees of freedom; (6) p-value = 0.10

Physician assessment of teleophthalmology for patient triage:

“All Facilities”: (1) Estimated intercept = 2.73***; (2) Residual standard error = 0.66, on 152 degrees of freedom; (3) Multiple R-squared = 0.66; (4) Adjusted R-squared = 0.63; (5) F-statistic = 22.87, on 13 and 152 degrees of freedom; (6) p-value < 2.2e-16

“Rural Facilities”: (1) Estimated intercept = 4.32**; (2) Residual standard error = 0.57, on 13 degrees of freedom; (3) Multiple R-squared = 0.75; (4) Adjusted R-squared = 0.50; (5) F-statistic = 2.98, on 13 and 13 degrees of freedom; (6) p-value = 0.03

2. Nurse manager assessment of teleophthalmology for full consultations:

“All Facilities”: (1) Estimated intercept = 3.04***; (2) Residual standard error = 0.71, on 239 degrees of freedom; (3) Multiple R-squared = 0.62; (4) Adjusted R-squared = 0.60; (5) F-statistic = 27.69, on 14 and 239 degrees of freedom; (6) p-value < 2.2e-16

“Rural Facilities”: (1) Estimated intercept = 4.13***; (2) Residual standard error = 0.68, on 28 degrees of freedom; (3) Multiple R-squared = 0.53; (4) Adjusted R-squared = 0.30; (5) F-statistic = 2.30, on 14 and 28 degrees of freedom; (6) p-value = 0.03

Physician assessment of teleophthalmology for full consultations:

“All Facilities”: (1) Estimated intercept = 2.48***; (2) Residual standard error = 0.59, on 152 degrees of freedom; (3) Multiple R-squared = 0.69; (4) Adjusted R-

squared = 0.66; (5) F-statistic = 25.65, on 13 and 152 degrees of freedom; (6) p-value < 2.2e-16

“Rural Facilities”: (1) Estimated intercept = 3.28**; (2) Residual standard error = 0.56, on 13 degrees of freedom; (3) Multiple R-squared = 0.78; (4) Adjusted R-squared = 0.55; (5) F-statistic = 3.47, on 13 and 13 degrees of freedom; (6) p-value = 0.02