

A Low-Cost, High-Fidelity Microsurgery Curriculum for Orthopedic Trainees



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Objectives

Problem: orthopedic residents have limited microsurgical experience, which limits their effectiveness and educational yield during the spine and hand rotations

Curriculum designed to achieve the following:

- Increase time working under scope
- Gain familiarity with instruments and techniques
- Gain efficiency in role of first assist
- Minimize cost
- Optimize time commitment
- Identify areas for improvement

Methods

Iterative approach to optimizing curriculum

Primary model: digital nerve coaptation

Enhanced challenge: digital vessel repair

Curriculum modified to optimize cost and efficiency

- Equipment acquired to minimize cost
- Materials examined to optimize cost and fidelity
- Training methods tailored to make efficient use of faculty time

Residents in PGY-2 and PGY-4 recruited for participation

- 2 sessions of 5 hours each

Evaluation by Global Rating Scale

Questionnaire developed to evaluate curriculum

Results

Equipment required: dedicated microscope

Additional equipment: hand micro tray from OR

Materials evaluated:

- Silicone practice vessels – moderate cost/low fidelity
- Live rat femoral vessels – very high cost/high fidelity
- Turkey wing vessels – low cost/moderate-high fidelity
- Chicken thigh vessels/nerve – very low cost/high fidelity

Online training video utilized

Additional training video made for procurement of materials

Time required (per resident per year):

- 10 resident hours
- 0.5 faculty & 0.5 fellow hours

Table 1: Total Calculated Costs

One-time Costs	
Table-top binocular microscope	\$400
Cost per resident (per year)	
8x vessels & 2x nerves (chicken thigh)	\$7
6x 8-0 nylon sutures	\$100
Total cost per resident (per year)	\$107
First year of implementation (10 residents)	\$1,470
Subsequent years	\$1,070

Conclusions

Greatest recurring cost: suture material

- Potential attenuation with corporate educational grant

Significant potential increased cost with dedicated instruments

Significant overall cost, even with minimization

Active resident recruitment and time accommodation required

Will require further evaluation of effectiveness with questionnaire results and increased participation

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