Cost Analysis of Percutaneous Fixation of Hand Fractures in the Main Operating Room Versus the Ambulatory Setting

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INTRODUCTION

Hand Fractures
•20% of all fractures
•Metacarpal and phalangeal fractures represent 33-42% and 40-59% of hand fractures
- 80/100,000 annual incidence of hand fractures
- 1.4 million/year in the United States alone

•For this reason, a timely, efficient and cost-efficient strategy is important to manage hand fractures deemed operative candidates

Operating Room (OR) versus Clinic
•Substantial increased cost
•Increased personnel
•Increased materials consumed
•Office-based under field sterility
- Decreased procedure time
- Decreased perioperative time
- Increased number of cases performed
- Convenient
  - Less patient travel and time off of work

Our Goal
•To compare the cost and efficiency of performing CRIF of hand fractures in the OR versus an ambulatory care setting
•Secondarily, to describe current practice trends in Canada

METHODS

Labour Costs
•Physician salaries (excluding surgeon)
- Based on average case length

•Non-physician salaries
- Proportional to time spent with patient

Material Costs
•Determined all equipment and associated cost
•Efficiency - Institutional averages
- Case length
- Turnover time
- Waitlist times

•Online Survey
- Opinio Software (ObjectPlant, Inc., Norway)
- Active members of Canadian Society of Plastic Surgeons

RESULTS

Cost Analysis	Main OR	Main OR with block	Ambulatory clinic
Supplies	117.47	117.47	68.43
Labour	343.80	548.02	47.16
Total (CAD $)	**461.27**	**665.49**	**115.59**

Table 1: Summary of the total cost of performing a K-wire fixation of a hand fracture in the operating room (OR) under a general anaesthetic or regional block versus an ambulatory care setting. Prices are in Canadian dollars (CAD).

What factors affect the ability to K-wire in clinic?	(%)
No access to clinical setting outside of OR	34 (n=31)
No access to fluoroscopy	70 (n=64)
No access to K-wire driver	49 (n=45)
I prefer another technique	2 (n=2)
Other	25 (n=23)

Table 2: Summary of information related to K-wire fixation of hand fractures from a survey of active Canadian Society of Plastic Surgery Members (*n*=111).

RESULTS

Efficiency
•OR – average 60 minute case length
- 4-5 CRIF cases/day

•Clinic – less turnover, clean-up and set-up
- 8 CRIF cases/day
- 60% increased efficiency

Survey
•111/420 active members of CSPS
•Only 50% of surgeons had access to fluoroscopy and necessary K-wiring equipment for use outside of the OR
•60% of surgeons are performing CRIF exclusively in the main OR

Cost
•More supplies used in OR versus clinic
- $117.47 versus $68.43 CAD
- 72% increase

•Majority of costs due to increased labour
- See Tables 1 and 3

Personnel	Main OR	Main OR regional	Ambulatory clinic
Registered Nurse	70.00	105.00	35.00
Orderly	32.86	32.86	N/A
Housekeeping	10.27	10.27	2.57
Registration Clerk	9.77	9.77	Automated
Transcription/dictation	6.33	6.33	6.33
Pre-operative nurse	7.67	7.67	N/A
Post-operative nurse	23.00	23.00	N/A
Post-operative nurse post	11.50	11.50	N/A
Clinic secretary	3.26	3.26	3.26
Block room anaesthetist	N/A	159.72	N/A
OR anaesthetist	164.40	164.40	N/A
Anaesthesia tech	4.75	4.75	N/A
Anaesthesia tech block	N/A	9.50	N/A
Total (CAD $)	**343.80**	**548.02**	**47.16**

Table 3: Summary of the total labour cost of performing a K-wire fixation of a hand fracture in the operating room (OR) under general or regional anaesthetic versus an ambulatory care setting. Prices are in Canadian dollars (CAD).

CONCLUSION

- The OR is 476% more expensive than an ambulatory care clinic for percutaneous fixation of hand fractures with more personnel involved
- Efficiency in the OR is less than ambulatory setting
- The majority of K-wire fixations are still being performed in the main OR across Canada
  - Due to the absence of equipment necessary to perform these cases effectively
- The cost of a mini C-arm could be offset by less than 100 cases

Figure 1: Flow diagram of the personnel involved in performing a K-wire fixation of a hand fracture in the clinic versus OR under a regional block. RN = registered nurse, OR = operating room, PACU = post anaesthesia care unit