

# Economic Issues and Patient Outcomes in Outpatient Regional Anesthesia



Brian A. Williams, MD, MBA

Associate Professor

University of Pittsburgh

Department of Anesthesiology

# Agenda:

---

- Introduction
- Economics and Resource Management 101
- Expanding RA use in outpatients
- Hospital Costs
- Cost Justification / Reimbursement
- Outcomes Measurement
- Summary and Conclusion

# Introduction

---

- Review definitions of economics and outcomes
- Outpatient regional anesthesia and the efficient use of health care resources
- Preliminary data describing patient outcomes using survey instruments validated in other epidemiologic applications

# Agenda:

---

- Introduction
- Economics and Resource Management 101
- Expanding RA use in outpatients
- Hospital Costs
- Cost Justification / Reimbursement
- Outcomes Measurement
- Summary and Conclusion

# Definitions

---

- ❑ **Managerial Economics**: how to direct scarce resources to efficiently achieve manager's goal
- ❑ **Scarce Resources** in Outpatient RA:
  - Postoperative nursing – symptom management / unplanned admissions
  - Hospital beds / transportation for unplanned admissions
  - Qualified regional anesthesiologists
  - Appropriate caseloads to justify the service
  - Equipment, supplies, ancillary personnel, education/training (surgeons, patients, staff)

# Economic Proxy Measures of Perioperative Resource Use

---

## □ Time Management:

### AACD Procedural Times Glossary

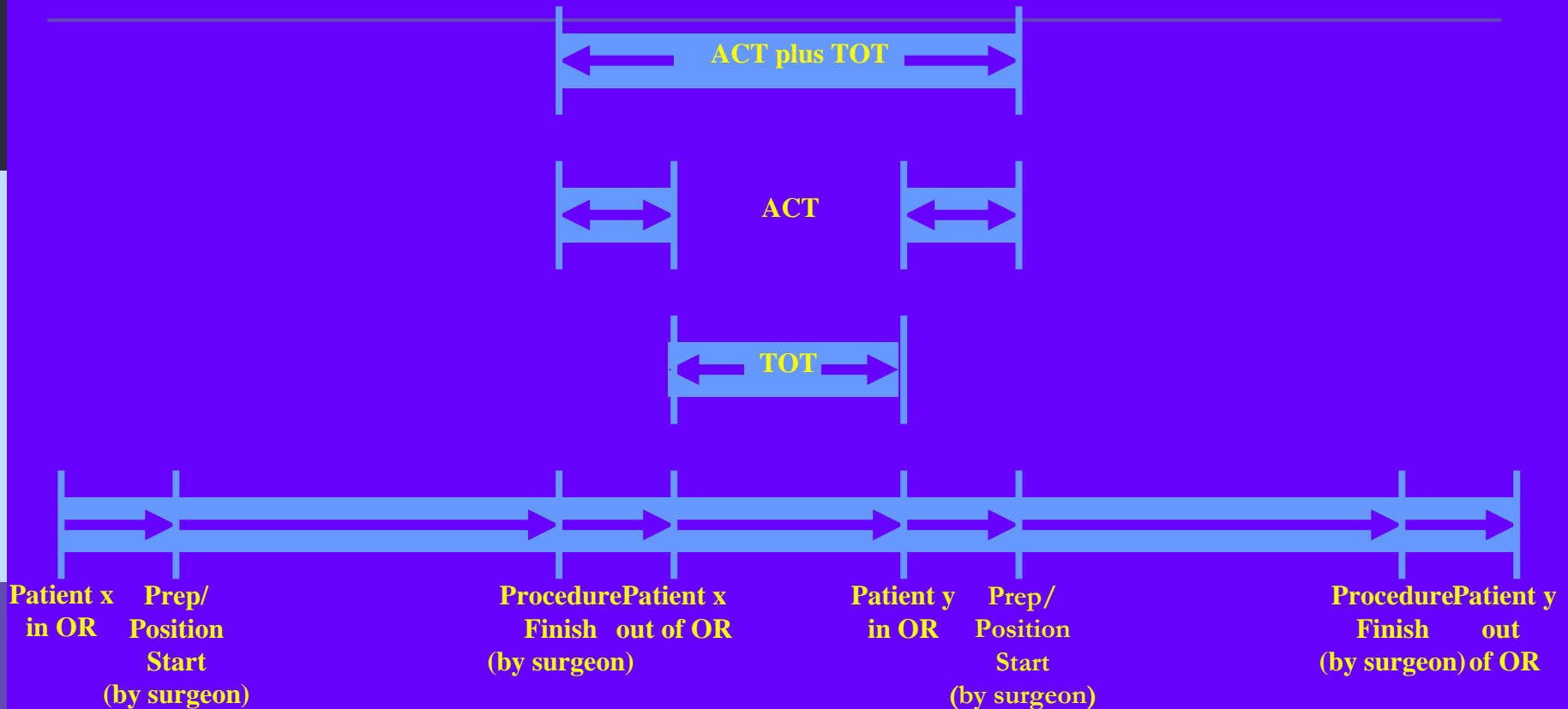
- *American Journal of Anesthesiology* 1996; 23(5 suppl): 3-12

## □ Labor intensity in postoperative nursing care: Interventions for:

- PONV
- Pain
- Shivering, pruritis

## □ PACU Bypass

# Anesthesia-Controlled Time and Turnover Time



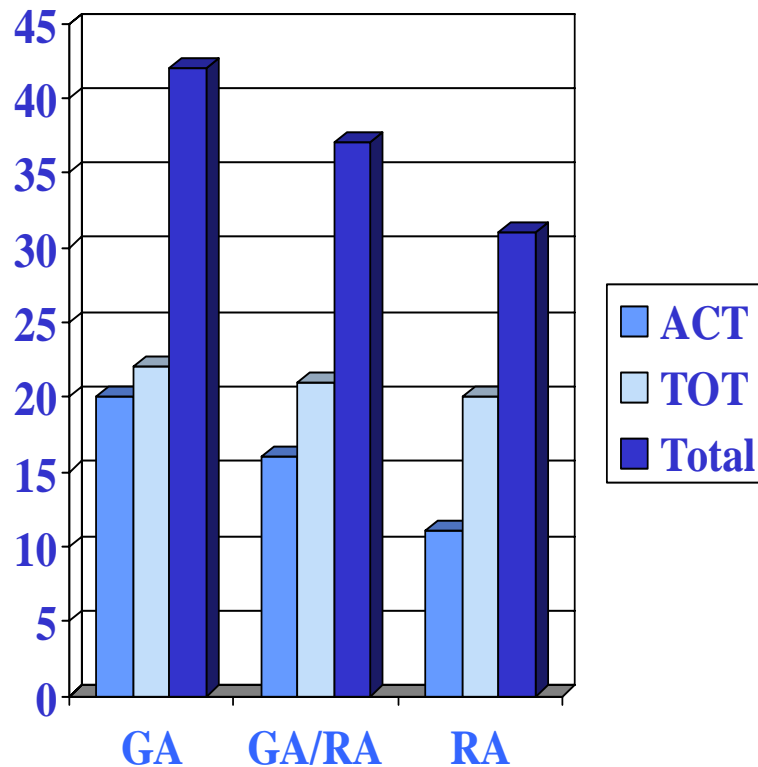
Williams et al. *Anesthesiology* 93(2):529-538, 2000

Donham et al. *Am J Anesth* 23(5S):5-12, 1996

Dexter et al. *Anesth Analg* 81(6):1263-1268, 1995

# Anesthesia-Controlled Time and Turnover Time per anesthesia technique (minutes)

---



- RA induction room, vs. GA induction in OR
- Turnover times: no differences across techniques
- RA: lowest ACT and total time (ACT + TOT)
  - 9-minute OR time savings with RA / induction room
  - $P < 0.05$

# Proposal for Standardized PACU Bypass / Discharge Criteria for Outpatients

---

- Assumes no requirements for any parenteral interventions for pain, nausea, vomiting, pruritis, shivering, or hypotension / orthostasis.
- Patient pain scores should not exceed 2-3 (out of 10) at the time of PACU Bypass or PACU Discharge
- Check and balance system for anesthesia providers, PACU nurses, and Phase II nurses

Williams, *Anesthesiology* 2004; 101(1): 3-6

Williams et al., *Anesthesiology* 2000; 93: 529

Hadzic et al., *Anesthesiology* 2004; 101(1):127-32

Aldrete, *J Clin Anesth* 1995; 7: 89

Jankowski et al., *Anesth Analg* 2003; 97: 1003

White and Song, *Anesth Analg* 1999; 88: 1069

<b>Movement</b>	Scores:
Purposeful movement of (at least) 1 LE and 1 UE	2
Purposeful movement of at least 1 UE (and neither LE)	1
No purposeful movement	0
<b>Blood Pressure (sitting and supine)</b>	Scores:
Within 20% of preoperative baseline, not orthostatic	2
Between 20-40% of preop baseline, not orthostatic	1
Less than 40% of preop baseline, and/or orthostatic	0
<b>Level of Consciousness</b>	Scores:
Awake, follows commands; easily aroused when called	2
Arouse to stimuli, protective reflexes, follow commands	1
Obtunded or persistently somnolent; $\pm$ protective reflexes	0
<b>Respiratory Effort</b>	Scores:
Coughs and deep-breathes freely, and/or on command	2
Involuntarily cough only; unsupported airway	1
Tachypnea, dyspnea or apnea, and/or requiring airway support	0
<b>Oxygen Saturation</b>	Scores:
$\geq$ 95% or (Preop reading minus 1) without supplemental O <sub>2</sub>	2
$\geq$ 95% or (Preop reading minus 1) with supplemental O <sub>2</sub>	1
$<$ 95% or (Preop reading minus 1) $\pm$ supplemental O <sub>2</sub>	0

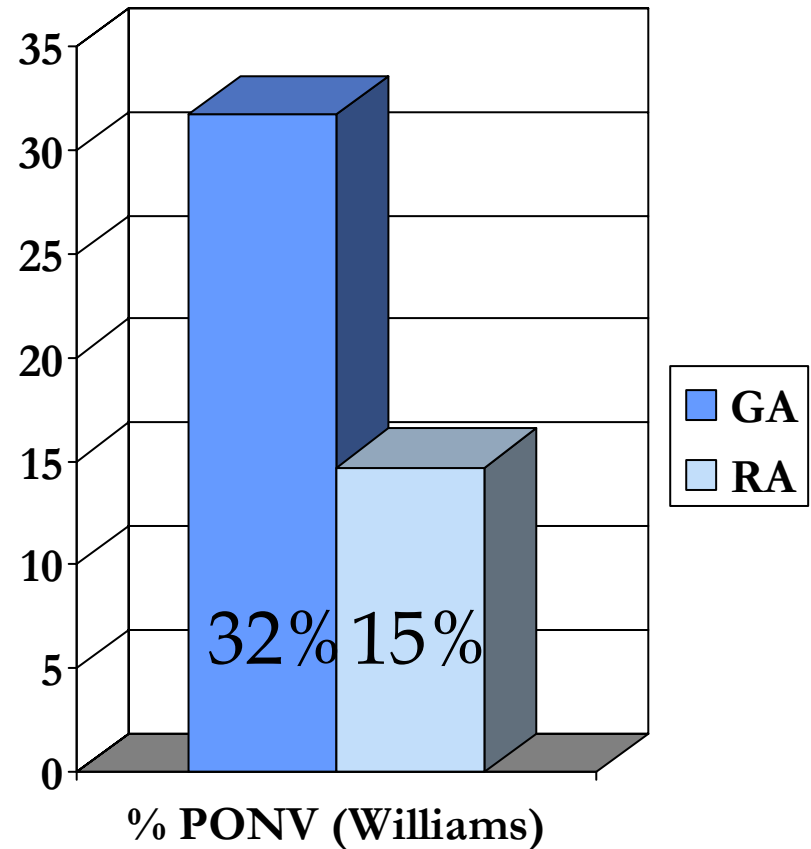
# PONV – in my hands (1995-99)

## My practice:

- N=438 ACLs
  - 139 GA ± block(s)
  - 299 RA
- 2-3 agent prophylaxis for all patients:  
perphenazine / dexamethasone ± ondansetron

## My colleagues:

- N=498 ACLs; 288 GA, 210 RA
- Erratic / no PONV prophylaxis
- 36% PONV in GA,  
27% PONV in RA  
(OR=1.5; P=0.03)



Odds Ratio = 2.7; P<0.001

# Agenda:

---

- Introduction
- Economics and Resource Management 101
- Expanding RA use in outpatients
- Hospital Costs
- Cost Justification / Reimbursement
- Outcomes Measurement
- Summary and Conclusion

# Preface to Postop Pain: Allocate Scarce Resources Wisely

---

## UPMC South Side Hospital: Recommended Analgesia for Knee Surgery

### Category I (Mild)

- **No blocks unless unanticipated postoperative pain occurs**

### Category II (Moderate)

- **Single-injection femoral nerve block recommended:**  
Arthrotomy, deep hardware removal, microfracture, mosaicplasty / chondroplasty, ACL allograft
  - **Femoral block**
  - No sciatic block unless pain refractory to femoral block
- **Continuous Catheter recommended:**  
ACL patellar tendon autograft, femur osteotomy
  - **Femoral catheter bolus and infusion**
  - No sciatic block unless pain refractory to femoral block

# UPMC South Side Hospital:

## Recommended Analgesia for Knee Surgery (cont.)

### Category III (Severe)

<b>Procedure</b>		
<i>Most Invasive Category III (test for dorsiflexion before ablating sciatic nerve motor response)</i>		
<b>Total knee replacement</b>	<b>Continuous Femoral Catheter</b>	<b>Continuous Sciatic Catheter</b>
<b>High tibial osteotomy</b>		
<b>Multiligament reconstruction</b>		
<b>Posterolateral corner reconstruction</b>		
<i>Moderately Invasive Category III</i>		
<b>ACL hamstring autograft</b>	<b>Continuous Femoral Catheter</b>	<b>Single- injection Sciatic</b>
<b>Meniscal reconstruction</b>		
<b>Unicompartmental knee arthroplasty</b>		
<i>Less Invasive Category III</i>		
<b>Distal patella realignment</b>	<b>Single- injection Femoral</b>	<b>Single- injection Sciatic</b>

## Postop Pain, Unplanned Admissions, Surgical Invasiveness, and Nerve Blocks Used

---

Pain interventions in PACU NOT predicted by blocks used  
(high proportion of PACU Bypass)

For Phase II Pain Interventions:

- ❑ Less invasive / Category I Knee surgery:
  - Blocks did not predict RN pain interventions
  - Blocks did not predict unplanned admissions
- ❑ More invasive / Category II-III Knee surgery:
  - Fem-Sci Blocks predicted fewer RN interventions
  - Fem and Fem-Sci Blocks predicted fewer unplanned admissions (versus when no blocks were used)

Williams et al. *Anesthesiology* 98(5): 1206-1213, 2003

# Agenda:

---

- Introduction
- Economics and Resource Management 101
- Expanding RA use in outpatients
- Hospital Costs
- Cost Justification / Reimbursement
- Outcomes Measurement
- Summary and Conclusion

# Hospital Costs: ACLR 1995-1999

---

Base costs and significant predictors of hospital costs

- ACL base procedural cost: \$3500
- Using allograft tissue: \$260
- Inflation: \$75/3m  
(2.1% of \$3500)
- Hospital Admission: \$385
- PACU bypass: **-\$420**

All P values  $\leq 0.003$

**Bypassing PACU and same day discharge  
= \$800 hospital cost savings  
(versus PACU stay with hospital admission)**

Williams et al., *Anesthesiology* 2004; 100:697-706

# Hospital Costs

---

## Selling Points to Administrators:

- ❑ **PACU Bypass** (0-50% if GETA, 75+% with RA)
- ❑ **Less postop pain/PONV**  
before same-day discharge  
(less nursing labor intensity  
and less potential patient backlog)
- ❑ **Dramatic improvement in patient satisfaction**
- ❑ **Hospital cost reductions**

# Hospital cost reductions

---

- Lower PACU staffing requirement (28 vs. 36 PACU FTE for 25,000 annual cases in which 3000 patients were fast-tracked) if system-wide PACU bypass process
- ?Less forced overtime in OR (less surgical down time)
- Fewer unplanned admissions
- \$1.2M annual savings for 3000 orthopedic outpatients (estimate)

# Agenda:

---

- Introduction
- Economics and Resource Management 101
- Expanding RA use in outpatients
- Hospital Costs
- Cost Justification / Reimbursement
- Outcomes Measurement
- Summary and Conclusion

# Cost Justification/Reimbursement

---

- CPT Codes
- Consultation codes
- Facility Fee codes
- GA vs. PNB
- Single-injection PNB vs. CPNB
- Geographical Differences in payment

# Know Your Codes

---

## Pain Diagnoses:

(for full consultations)

Shoulder	719.41
Upper arm / elbow	719.42
Forearm / wrist	719.43
Hand	719.44
Pelvis / Hip / Thigh	719.45
Knee / Lower Leg	719.46
Ankle / Foot	719.47

Thanks to J. Greger, MD, for  
sharing lecture information  
regarding codes:

[www.regionalblock.com](http://www.regionalblock.com)

## Block Codes:

	Single:	Cont.
Paravertebral	64520	"-22"
Sciatic	64445	64446
Lumbar Plexus	64447	64449
Femoral	64447	64448
Saphenous	64450	
Ankle	64450	
Brachial Plexus (shoulder)	64415	64416
Brachial Plexus (arm)	64417	64416

# Notes on Codes

---

- Single-injection  
peripheral nerve block  
(not otherwise specified)  
is 64450
- Peripheral nerve block catheter  
(not otherwise specified) is “-22”  
appended to the 5-digit block code  
(if there is no code for a given catheter)

# Blocks for Postop Pain Management

---

## Spinal with blocks

- Spinal is “global fee” anesthetic
- Blocks are charge modifiers “xxxxx-59”

## GA with blocks

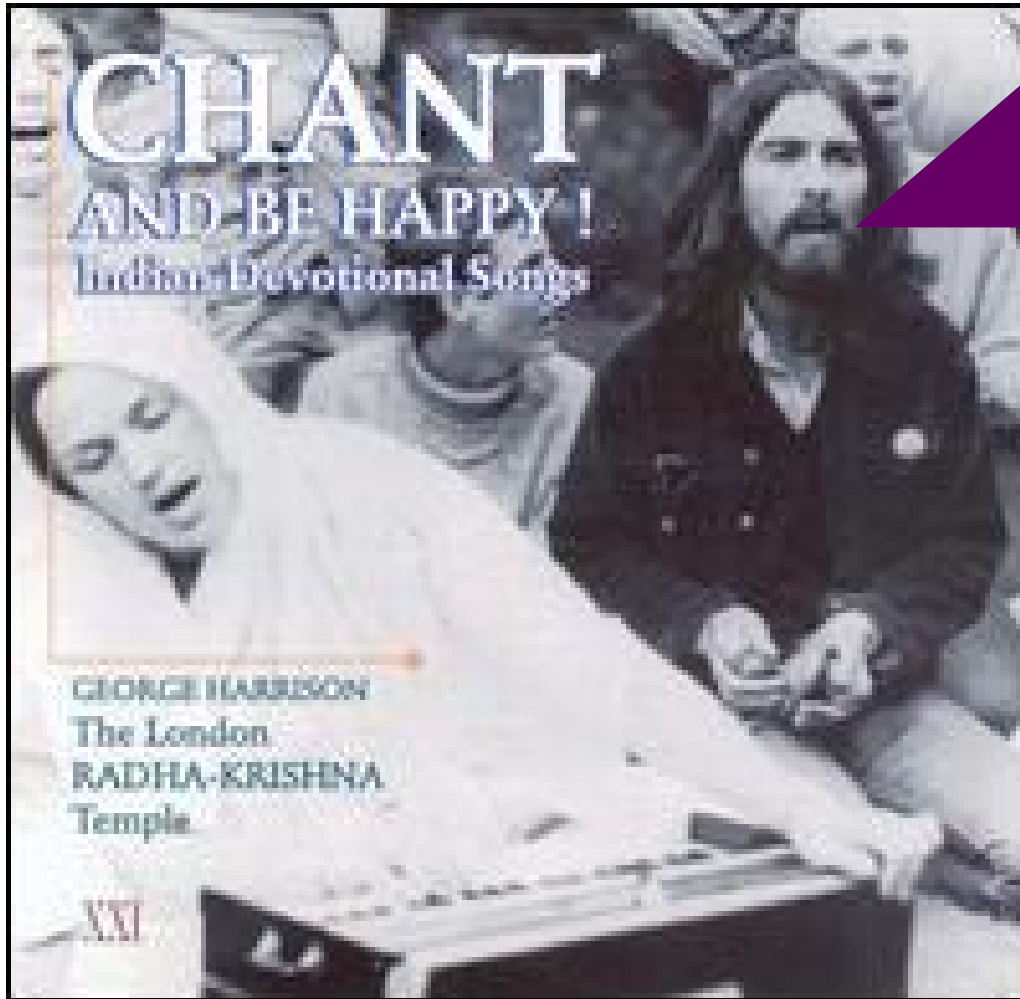
- GA is “global fee” anesthetic
  - GETA, LMA
  - Mask / TIVA
    - Document intraop unresponsiveness
- Blocks are charge modifiers “xxxxx-59”
- Teach your coders about Mask/TIVA as being a category of GA

## Notes on the “Blocks for Postop Pain Management” Designation

---

- Please do not bill for GA if you do not produce and document unresponsiveness (JCAHO definition of GA)
- Please do not bill for blocks as charge modifiers unless spinal or GA is used along with the block
- Block reimbursement = anesthesia global fee if blocks are not used with GA or spinal concurrently

# Third-Party Payments??



There's one for you,  
19 for me...

Should 5%  
appear too small,

Be thankful  
I don't take it all...

Harrison (1943-2001)

# Billing Units and Payments

---

Procedure	Units (Single / Continuous)	Range of payments	
		Single	Continuous
Paravertebral	Cervical/Thoracic: 10 Lumbosacral: 8	\$21 - \$187	N/A
Sciatic	7 / 12	\$24 - \$161	\$24 - \$309
Lumbar Plexus	7 / 12	\$21 - \$140	\$21 - \$285
Femoral	7 / 12	\$21 - \$140	\$21 - \$285
*Saphenous	5	\$21 - \$187	N/A
*Ankle	5	\$21 - \$187	N/A
Brachial Plexus (shoulder)	8 / 13	\$35 - \$411	\$68 - \$312
Brachial Plexus (arm)	8 / 13	\$21 - \$411	\$68 - \$312
**Epidural	C/T: 10 L/S: 9 Daily: 3	\$83 - \$298	\$17 - \$137

# Facility Fee Codes

---

- ❑ Nerve blocks for postop pain management may have allowable billing for “facility fees”
- ❑ Hospital/facility charge, not a professional fee.
- ❑ Need to consider if facility fee will include equipment costs, or if equipment will generate separate charges
- ❑ Each block type, and single-injection vs. catheter, should have its own code

# Differences in payments nationwide

---

- In negotiations with 3<sup>rd</sup> party payers (professional fees, ?facility fees):
  - Create a subcategory of care specific for PNB and CPNB
  - Mandate PNB and CPNB as unbundled from anesthesia global fee;  
Aim for 100% of RVU-based charges
  - Settle for no less than 120% of Medicare payments (\$60-80 single, \$60-180 CNB)

# Agenda:

---

- Introduction
- Economics and Resource Management 101
- Expanding RA use in outpatients
- Hospital Costs
- Cost Justification / Reimbursement
- Outcomes Measurement
- Summary and Conclusion

# NIAMS

**National Institute of  
Arthritis and  
Musculoskeletal and  
Skin Diseases**



Supported by a  
grant from the

**National  
Institutes  
of Health**

---

U.S. Department of Health and Human Services

# Outcomes after ACLR: Effect of FNB

---

Planned sample size: N=270 (moderate effect size), 3 groups

## Femoral Nerve Block Bolus and Infusion:

*Group 1:* Saline bolus, saline infusion X 55 hours

*Group 2:* Levobupivacaine 0.25% bolus (30 cc), saline infusion

*Group 3:* Levobupivacaine 0.25% bolus and infusion (5 cc/hr)

NOTE: Groups 1-3 do not necessarily match Groups ABC in the results. Groups ABC maintain blinding

**All patients: propofol sedation, ketamine 0.2 mg/kg**  
**Spinal: ipsilateral hyperbaric bupivacaine 9-12 mg**

# ACL Study – Methods (cont.)

---

## Intra-articular injection:

meperidine / neostigmine / ketorolac

## Antiemetics:

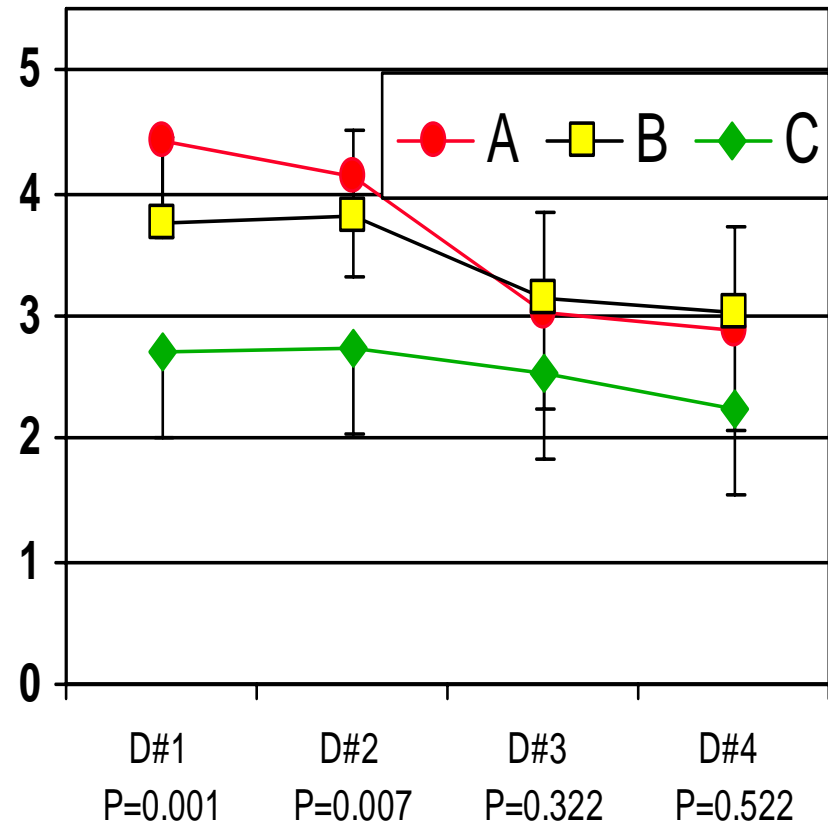
perphenazine / dexamethasone / ondansetron

## Postoperative per-oral analgesia:

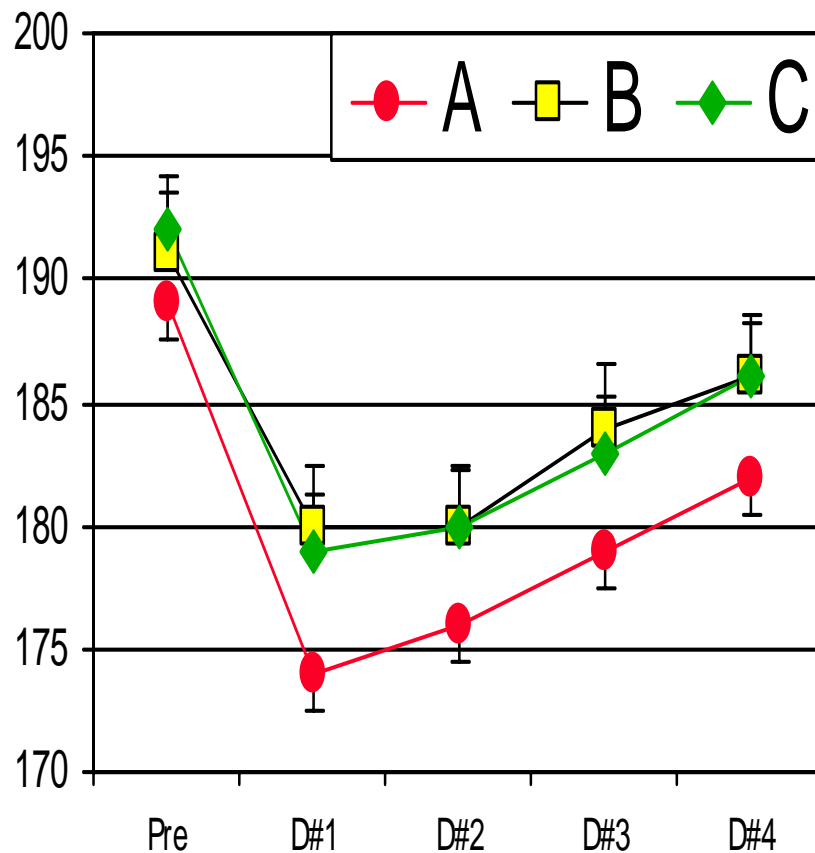
- CR oxycodone      10-30 mg q12h
- IR oxycodone      5-10 mg q4-6h prn
- Rofecoxib            50 mg qam X 6d

# ACL Study – Dynamic Pain Scores

- Groups are blinded
- 4 days after surgery
- Group C pain scores 2-3 / 10
- Overall model P value =0.047
- N=149



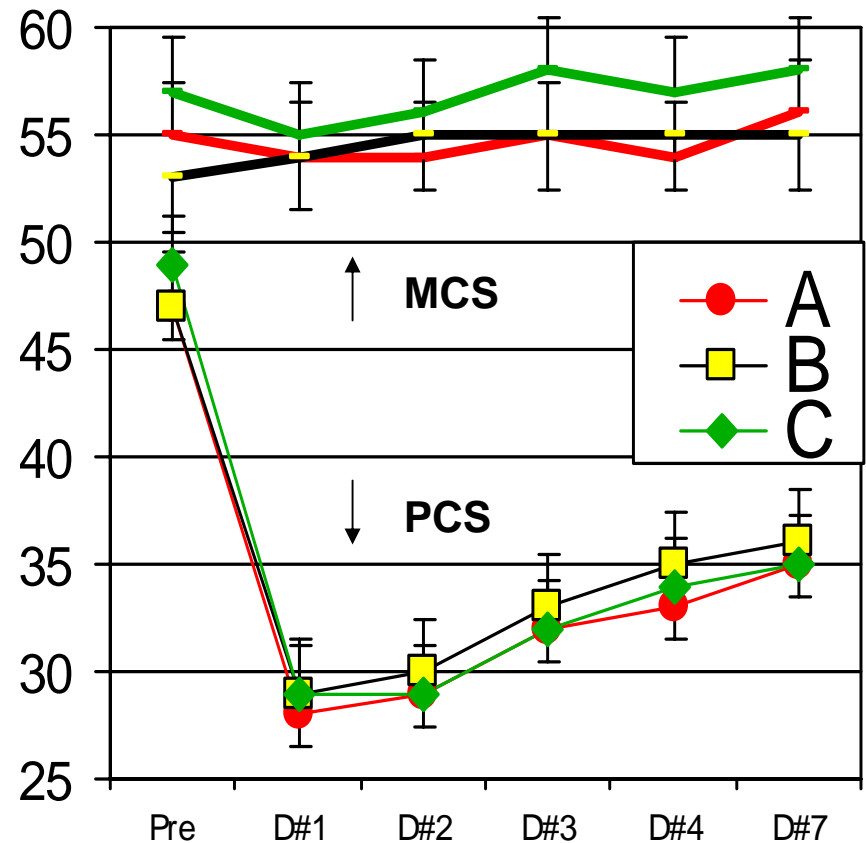
# ACL Study – QoR-40 Scores



- Groups are blinded
- 4 days after surgery
- Groups B-C vs. A:  
P value =0.047
- Pain scores do not match patient-reported outcomes on written surveys
- N=114 (autografts)

# ACL Study – SF-8 Scores

- Groups are blinded
- 7 days after surgery
- No differences between groups
- MCS scores return to baseline on POD#1 (comprehensive multimodal analgesia)
- N=146



# ACL Study – 100-day outcomes

---

- No significant differences based on nerve block treatment group
  - SF-36 (general health status)
  - Knee Outcome Survey

# Agenda:

---

- Introduction
- Economics and Resource Management 101
- Expanding RA use in outpatients
- Hospital Costs
- Cost Justification / Reimbursement
- Outcomes Measurement
- Summary and Conclusion

# Surgeon Acceptance

---

## □ Benefits to surgeons

### ■ Less “surgical down time”

*Anesthesiology* 93(2):529-538, 2000

- GETA: 42 minutes, RA 31 minutes

### ■ Fewer unplanned admissions (no need to round)

*Anesthesiology* 2004; 100:697-706

- GETA 17%, Spinal/FNB 2%  
after ACL reconstruction

### ■ No apparent long-term outcome issues

# Summary, Discussion

---

- ❑ Learn the skills
- ❑ Build the team
- ❑ Change the process
- ❑ Pay attention to coding, reimbursement, and contract negotiations
- ❑ Don't limit outcomes assessment to VAS; look at general health status (QoR, SF-8)
- ❑ Persevere