

How Can We Increase the Use of Continuous Peripheral Nerve Blocks in the Ambulatory Setting?



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Disclosures:

- Arrow International
- I-Flow Corporation

Agenda:

- Introduction
- Benefits of CPNB
- Barriers to Regional Anesthesia
- Equipment
- Training
 - Surgical Indications
 - Local Anesthetics
 - Procedural Technique
 - Technical Pearls
- Outcomes Measurement
- Cost Justification / Reimbursement
- Surgeon Acceptance
- Administrative Help
- Discussion

Introduction of Speaker

□ Background

- Most work to date on single-injection nerve blocks and economic implications
 - Less time in OR - *Anesthesiology* 93:529, 2000
 - PACU Bypass - *Anesthesiology* 97:981, 2002
 - Less postop pain - *Anesthesiology* 98: 1206, 2003
 - Hospital cost savings potential of up to \$1.2M for 3000 orthopedic outpatients per year via PACU Bypass and avoided hospital admissions
Anesthesiology 100:697, 2004

Introduction of Speaker

- What motivated my interest in CPNB?
 - Do continuous blocks help or hurt postop rehab?
 - NIH-funded ACL study, 2001 – present
- Key driving force behind CPNB?
 - Optimizing analgesia, rehab outcomes, labor intensity, and fair payment for value-added service
 - These issues are current in my practice

Benefits of Continuous PNB

- ❑ Focused, long term analgesia
- ❑ Increased comfort for patient
- ❑ Fewer side effects (PONV, somnolence)
- ❑ Shorter hospital stays, same-day discharge when overnight stay required previously
- ❑ ?Improved potential for early rehab (well-documented for TKR)
- ❑ Lower overall costs, but ??payments

Barriers to starting CPNB

- Regional Anesthesia Equipment/Imaging
- Training/Education
 - Anesthesia, Orthopedics, Nursing, & Administration
- Outcomes Measurement
 - Hospital efficiency, Patient-reported outcomes
- Cost Justification/Reimbursement
- Surgeon Acceptance, Administrative Help

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Equipment

- Needles
- Catheters
- Infusion Pumps
- Stimulators
- Imaging

Equipment

Most important criterion:

Is the equipment that you are using giving you the best chance for success for 40-80 hours postoperatively?

Testing for success before discharge home:
more difficult for outpatients

Aim for 95+ % Success rate (end of 1 year),
and ~98% (end of 2 years). Keep track.

Boluses and infusions

Optimal balance of interscalene analgesia and preserved motor function:

(for ropivacaine 0.2% or levo-bupivacaine 0.125%)

- infusion rate: 5-6 mL/hr
- intermittent boluses of 2-4 mL
- 15-20 minute lockout

Singelyn A&A 1999, Borgeat A&A 2001, Casati A&A 2003

Use these principles to estimate doses for other blocks

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Training/Education

- Anesthesiologist / Anaesthetist
 - Nerve Anatomy and **Surgical Indication (next slide)**
 - **Local Anesthetics, Procedural Technique**
 - **Technical Pearls: *Tunneling and dressing***
 - Implementation of PNB Program
Best Practice and Research Clinical Anaesthesiology 16(2):175, 2002
 - **Billing/Reimbursement**
- Orthopedic Surgeon
 - **Benefits of PNB** (Williams, *BP and R*, 2002)
- Nursing, Administration
 - Post-operative management guidelines
 - Cost savings

Surgical Indications: Outpatient Knee Surgery

Category I 'Mild' (Postop nerve block analgesia optional)	Category II 'Moderate' (Femoral or Lumbar Plexus block routinely recommended)	Category III 'Severe' (Postop femoral and sciatic nerve analgesia routinely recommended)
<p>Knee arthroscopy with:</p> <ul style="list-style-type: none"> • debridement • lateral release • "meniscal surgery"* • "meniscal repair"* • removal of superficial hardware • "drop-out cast application" <p>EUA-manipulation (surgeons commonly request locks for this, however)</p>	<ul style="list-style-type: none"> • Open arthrotomy (SS/ possible CC) • Removal of deeply imbedded intraarticular hardware (SS) <p>Knee arthroscopy with:</p> <ul style="list-style-type: none"> • Microfracture (SS) • Mosaicplasty / chondroplasty (SS) • ACL reconstruction (patellar tendon (CC) or allograft (SS)) <p>Osteotomy of femur (CC)</p>	<ul style="list-style-type: none"> • Total knee arthroplasty (CC fem, CC sci) • Tibial osteotomy (CC fem, CC sci) • <i>Distal</i> patellar realignment (SS fem, **low-dose SS sci) • Uni-compartmental knee arthroplasty (CC fem, **low dose SS sci) <p>Knee arthroscopy with:</p> <ul style="list-style-type: none"> • ACL with hamstring (CC fem, **low dose SS sci) and/or other ligament reconstruction (LCL, PCL, MCL) (CC fem, CC sci) • Posterior oblique ligament (POL) or "posterolateral corner" reconstruction (CC fem, CC sci) • Meniscal reconstruction (CC fem, SS sci)

Nerve block dosing guidelines for Categories II and III

Anesthetic Blocks	<p><u>Single-shots (SS) with NO CATHETER:</u> Lumbar plexus: 30 mL: ropiv 0.75% <ul style="list-style-type: none"> • Reduce lumbolus to 20-25 mL if lum CC in place Sciatic: 20-25 mL mepiv (1-1.5%).</p> <hr/> <p><u>Additives</u> for SS and preop boluses in CC patients: Clonidine not to exceed 1.5 mcg/kg or 150 mcg per patient Epinephrine (optional, but recommend for lumbar plexus [1:300k])</p>	<p><u>Single-shots (SS) with NO CATHETER:</u> Lumbar plexus: 30 mL: ropiv 0.75% Sciatic: 20-25 mL ropiv 0.5% ** If "Low-dose Sci," consider net dose ropiv 0.25% added to 1% mepiv</p> <hr/> <p><u>Additives</u> for SS and preop boluses in CC patients Clonidine not to exceed 1.5 mcg/kg or 150 mcg per patient Epinephrine (optional, but recommended for lumbar plexus [1:300k])</p>
Analgesic SS Blocks	<p>No CC: Femoral: 30-40 mL ropiv 0.5%. Omit sciatic blocks.</p> <hr/> <p>Yes CC: Femoral: 20-30 mL 0.5% ropiv. Omit sciatic blocks.</p>	<p>No CC: Femoral: 30-40 mL ropiv 0.5 – 0.75%. Sciatic: 20-25 mL ropiv 0.5% ** If "Low-dose sciatic" with no CC: 20 mL ropiv 0.375% (e.g, sciatic for UKA, DPR, or ACL-HS auto)</p> <hr/> <p>Yes CC: Femoral: 30 mL ropiv 0.375%. Sciatic: 20 mL ropiv 0.375%</p>

Local Anesthetic Agents

- Currently used anesthetics
 - **Safety profiles:**
Ropivacaine > Levo-bupivacaine>>>>>> Bupivacaine
 - **Efficacy data**
For CPNB Infusions:
Ropiv 0.2% \sim Levo-bupiv 0.125% (Casati A&A 2003)
 - Clonidine added to ropivacaine infusion
has no additional benefit (Ilfeld A&A 2003)
- What's new? Infusion Rates v. Bolus Doses (Ilfeld RAPM 2003)
- Future developments

Procedural Technique

Personal opinion:

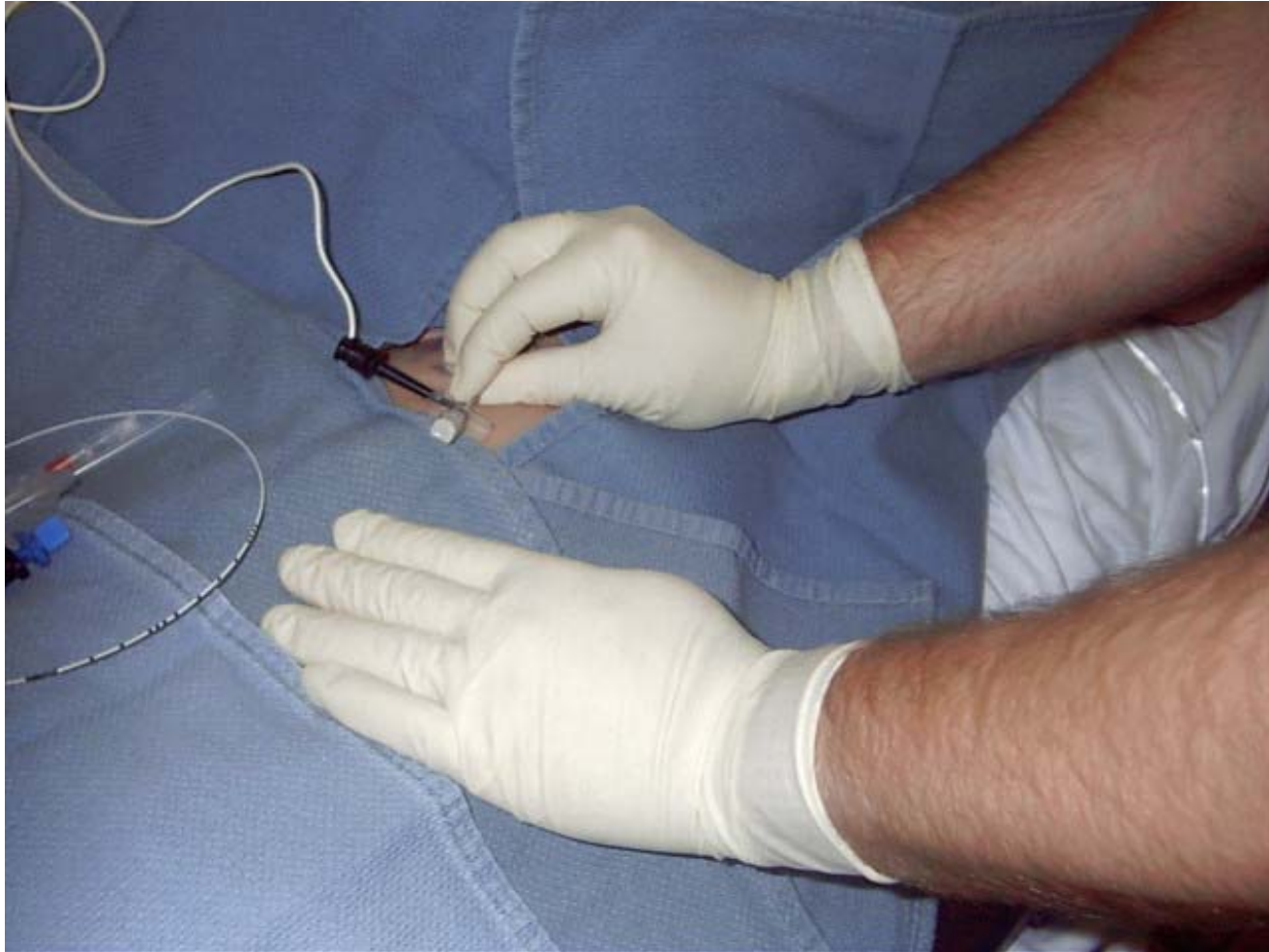
- Strict asepsis

- Gown, gloves, hat, mask, towel-drapes
- Chlorhexidine versus povidone iodine
- *One infection ruins all the benefits*

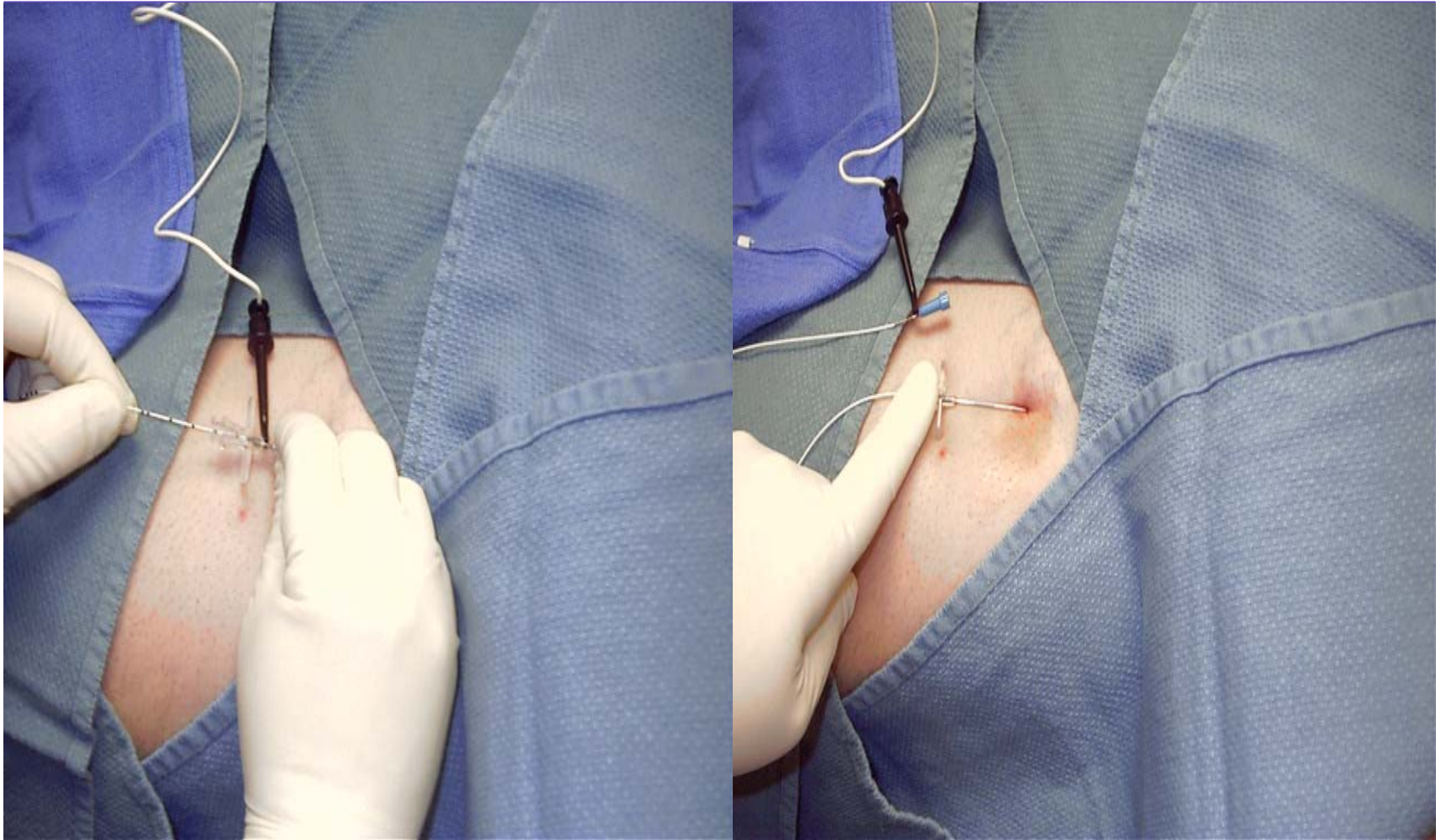
- Mastisol, not benzoin
(allergic dermatitis)

- Tunneling –
catheter cannot be effective if it falls out!

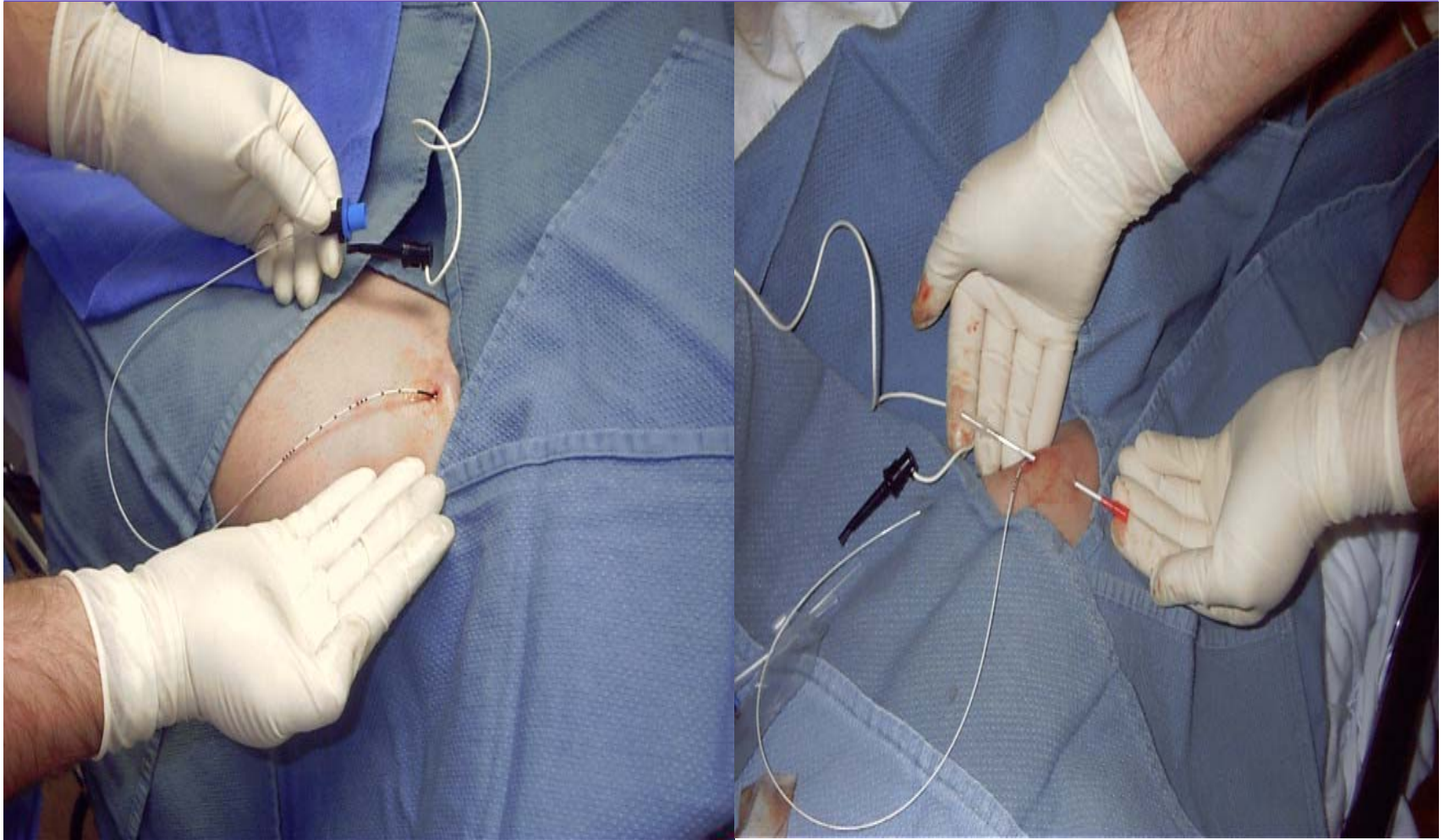
Nerve Identification



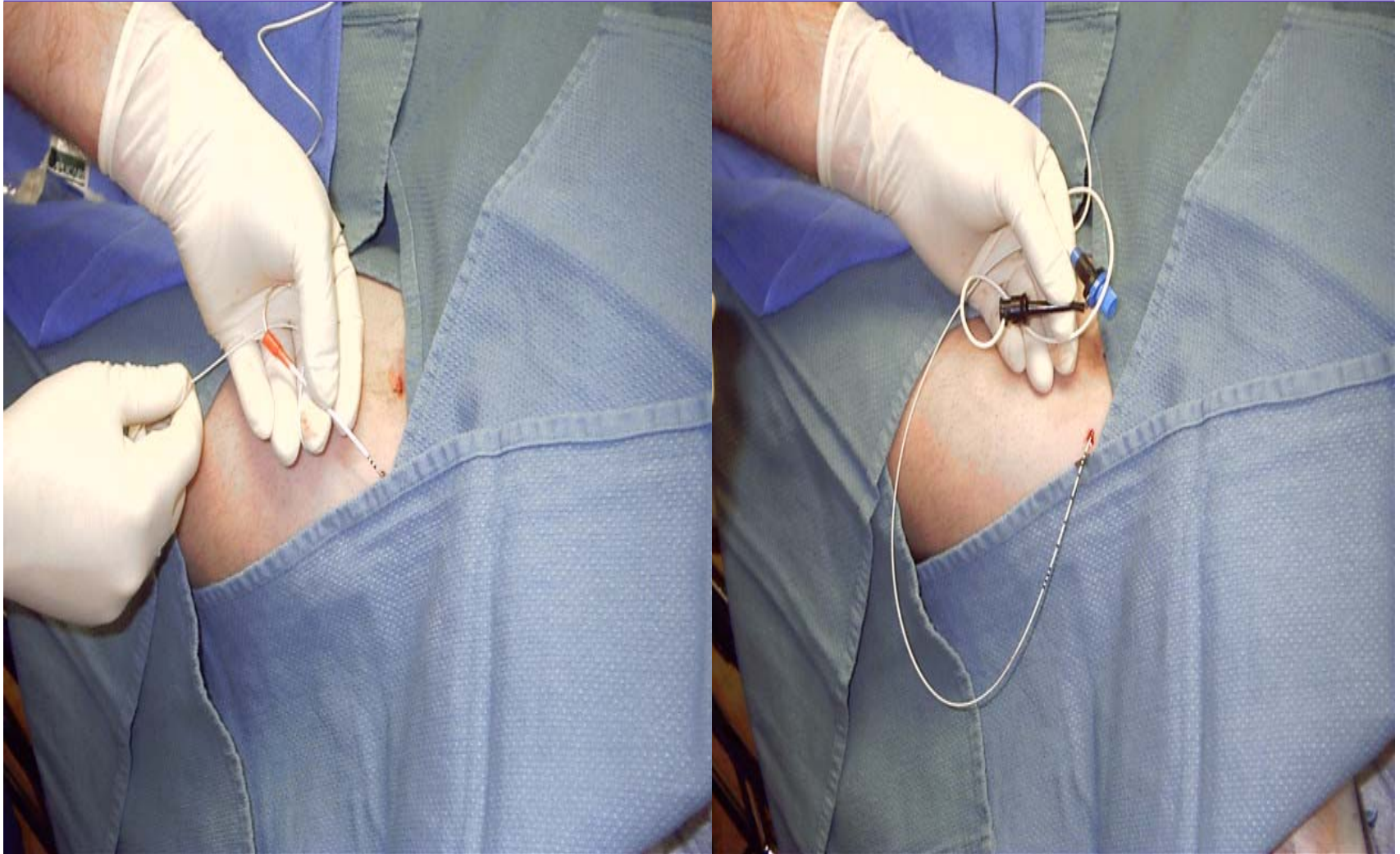
Nerve Identification-2



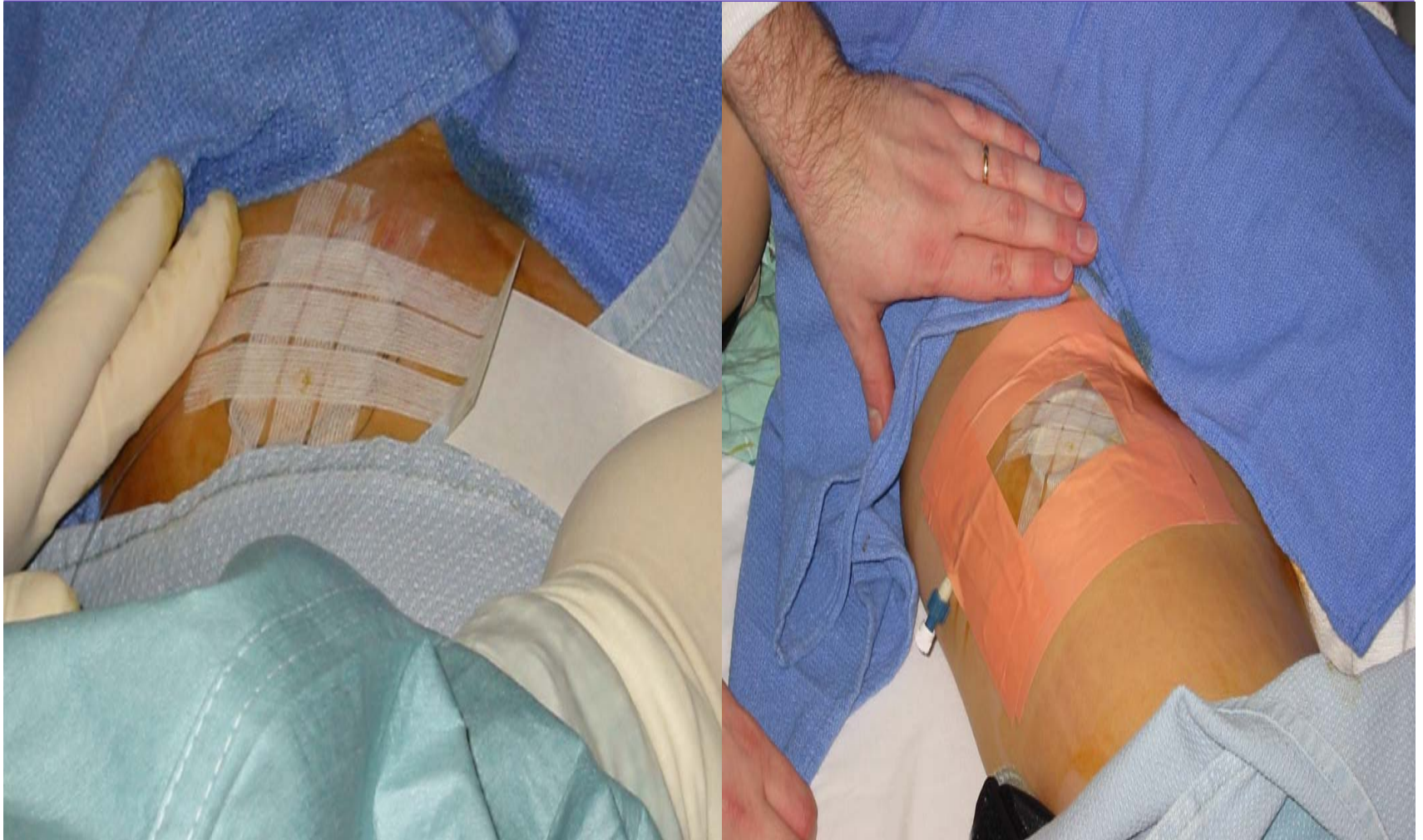
Confirmation and Tunneling



Tunneling and Confirming



Dressing



Infusion device

- ❑ Continuous infusion feature
- ❑ Bolus feature with lockout
- ❑ Clamp
- ❑ Disposable



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Outcomes Measurement

- Safety studies/Complication rates
 - Infection - n=211, 57% colonization at 48h, 3 cases of transient bacteremia
(Cuvillon *A&A* 2001)
 - ?Anticoagulation (esp. lumbar plexus)
 - 3 cases of retroperitoneal hematoma: difficult / repeated procedures, ± supratherapeutic anticoagulation, no permanent sequelae
Weller *Anes* 2003, Klein *Anes* 1997
 - Nerve Injury (0.02% to 0.4%)
[Auroy *Anes* 1997 ; Borgeat *Anes* 2001]

Outcomes Measurement

- Efficacy studies; “Long-term” effectiveness studies
 - Williams ACL study: SF8, SF36, QoR, Knee Outcome Survey – study in progress
- Stimulating vs. non-stimulating catheters
 - Ilfeld et al: 75% success rate (non-stim) versus 96%(stim)
 - Chelly opinion - Likely to be learning-curve dependent. Non-stim for most every block until evidence indicates otherwise
 - Hadzic opinion – non-stim for surgical anesthesia, use stimulating catheter if placed postoperatively

Outcomes Measurement

Stimulating vs. non-stimulating catheters

- Williams opinion – use stim if:
 - Interscalene and same-day discharge, until learning curve achieved (then perhaps go to non-stim)
 - Brachial plexus catheter requires specific twitch
 - Medial knee surgery and aiming for femoral and obturator block (mixed twitch: patellar snap and thigh adduction when catheter is threaded more and more cephalad)
 - Sciatic nerve blocks and same-day discharge, until learning curve achieved

Outcomes Measurement

- Ultrasound guidance & Imaging
 - Likely to be technically difficult when catheters are involved
 - Useful teaching tool with multiple applications
 - No experience, personally
(the next-generation RA controversy, like “nerve stimulator versus paresthesia”)

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Cost Justification/Reimbursement

- CPT Codes
- Consultation codes (inpatients only)
- Facility Fee codes
- GA vs. CPNB
- PNB vs. CPNB
- Geographical Differences in payment
- What's important to know?

Consultation Billing

- ❑ Separate from billing for Block Procedure
- ❑ Generally not collectible if happens on same calendar day as surgery, and/or within 24 hr of surgery
- ❑ Claim denial probability reduced if consultation and procedure is performed by anesthesiology pain service which is not involved with intraoperative care
- ❑ **If block performed postop due to poorly controlled pain, and block was not part original plan, a consultation form should be completed.**
- ❑ Consultation paperwork is burdensome, and payment can be a fraction of payment for the procedure itself.
- ❑ Medical record data must be entered specifically, and must match consultation billing criteria and data

Consultation Billing (cont.)

- Range of payments for initial consultations: \$33 - \$200
- Range of payments for daily follow-up: \$32 - \$85
- Medical assistance: \$30-50 and <\$20, respectively

Painful Details



Of Consultation Billing
for Inpatients

History (Consultation Billing)

HPI (history of present illness)		Brief <i>1-3 elements</i>	Brief	Extended <i>≥4 elements or more of ≥3 chronic or reactive conditions</i>	Extended	
? Location ? Severity ? Timing ? Modifying factors ? Quality ? Duration ? Context ? Associated signs and symptoms						
ROS (review of systems)		None	Pertinent to Problem <i>1 system</i>	Extended <i>2-9 systems</i>	Complete <i>≥10 systems or some systems with statement "all other negatives"</i>	
? Constitutional (wt loss, etc.) ? Ears, nose, mouth, throat ? Hem/lymph ? Eyes All/imm other						
? GI ? Integumentary (skin, breast) ? GU ? Card/vasc ? Musculo ? Neuro ? Resp ? Psych ? "All negative"						
PFSH (past family and social history)		Established/ Subsequent	None	None	One history area	Two or three history areas
? Past medical history ? Family history ? Social history		New/Initial	None	None	One or two history area(s)	Three history areas
No PFSH required: 99231-33, 99261-63; 99311-33						
Circle the entry farthest to the left for each history area. To determine history level, draw a line down the column within the circle farthest to the left		PROBLEM FOCUSED	EXP PROB FOCUSED	DETAILED	COMPREHENSIVE	

Formatting courtesy of Richard Rosenquist, MD, University of Iowa

Physical exam (Consultation Billing)

Organ systems: ? Constitutional (e.g., vitals, gen app) ? Eyes ? Ears, nose mouth, throat ? Cardiovasc ? Resp ? GI ? GU ? Musculo ? Skin ? Neuro ? Psych ? Hem/ lymph/Imm	System related to problem	Additional 2-4 systems	Additional 5-7 systems	8 or more systems
	PROBLEM FOCUSED	EXP PROB FOCUSED	DETAILED	COMPREHENSIVE

Formatting courtesy of Richard Rosenquist, MD, University of Iowa

General Multi-System Examination

(Consultation Billing)

- ❑ Constitutional (Measurement of 3 of 7 vital signs), plus general appearance
- ❑ Eyes
- ❑ Ears, Nose, Mouth and Throat
- ❑ Neck
- ❑ Respiratory
- ❑ Cardiovascular
- ❑ Chest (Breasts)
- ❑ Gastrointestinal (Abdomen)
- ❑ Genitourinary
- ❑ Lymphatic (Palpation of lymph nodes in two or more areas)
- ❑ Musculoskeletal- Examination of joint(s), bone(s) and muscle(s) of 1+ of the following areas: 1) head/neck; 2) spine, ribs and pelvis; 3) upper extremity; 4) lower extremity
- ❑ Skin
- ❑ Neurologic
- ❑ Psychiatric

“Calculation of Risk” (Consultation Billing)

- Risk Categories of Complications and/or for M&M
 - Minimal
 - Low
 - Moderate
 - High
- Presenting Problem(s)
- Diagnostic Procedure(s) Ordered
- Management Option Selected

“Number of treatment options”

(Consultation Billing)

A

Number of Diagnosis or Treatment Options

Problems to Exam Physician	Number X Points = Results		
Self-limited or minor (stable, improved or worsening)	Max = 2	1	
Established problem (to examiner); stable, improved		1	
Established problem (to examiner); worsening		2	
New problem (to examiner); no additional work-up planned	Max = 1	3	
New problem (to examiner); additional work-up planned		4	
		TOTAL	

Bring total to line A in Final Results for Complexity

Formatting courtesy of Richard Rosenquist, MD, University of Iowa

“Complexity of Data” (Consultation Billing)

Amount and/or Complexity of Data to be Reviewed

Data to be Reviewed	Points
Review and/or order of clinical lab tests	1
Review and/or order of tests in the radiology section of CPT	1
Review and/or order of tests in the medicine section of CPT	1
Discussion of test results with performing physician	1
Decision to obtain old records and/or obtain history from someone other than patient	1
Review and summarization of old records and/or obtaining history from someone other than patient and/or discussion of case with another health care provider	2
Independent visualization of image, tracing or specimen itself (not simply review of report)	2
TOTAL	

Bring total to line b in Final Results for Complexity

Formatting courtesy of Richard Rosenquist, MD, University of Iowa

“Decision-making level” (Consultation Billing)

Draw a line down the column with 2 or 3 circles and circle decision making level OR draw a line down the column with the center circle and circle the decision making level

A	Number of diagnoses or treatment options	≤ 1 Minimal	2 Limited	3 Multiple	≥ 4 Extensive
B	Amount and complexity of data	≤ 1 Minimal or low	2 Limited	3 Moderate	≥ 4 Extensive
C	Highest risk	Minimal	Low	Moderate	High
Type of decision making		STRAIGHT-FORWARD	LOW COMPLEX	MODERATE COMPLEX	HIGH COMPLEX

Formatting courtesy of Richard Rosenquist, MD, University of Iowa

New Consults for Inpatient Pain Management

□ 99251 - 99255

= Initial Inpatient Consultations:
Used only once per consultant per admission, there must be a request for consult documented in the chart and a consult note written by the consultant, that should reference the nature of the consult.

New Consults for Inpatient Pain Management

If a column has 3 circles, draw a line down the column and circle the code,
OR find the column with the circle farthest to the left,
draw a line down the column and circle the code.

History	PF	EPF	D	C	C
Examination	PF	EPF	D	C	C
Complexity of medical decision	SF	SF	L	M	H
Code	99251	99252	99253	99254	99255
Payment (\$)	35-125	70-80	95-105	130-150	180-200

PF = Problem focused

D = Detailed

SF = Straightforward

EDF = Expanded problem focused

C = Comprehensive

L = Low M = Moderate H = High

Inpatient Pain Management – Subsequent Visits

- 99231 - 99233= Subsequent Care:
These codes are to be used for initial or follow-up visits by physicians not elsewhere categorized. This would not be the code used when the visit can be considered a consultation. But these would be used for example for follow-up visits on days following a consultation.

Inpatient Pain Management – Subsequent Visits

If a column has 2 or 3 circles,
draw a line down the column and circle the code,
OR draw a line down the column
with the center and circle the code.

History	PF interval	EPF interval	D interval
Examination	PF	EPF	D
Complexity of medical decision	SF/L	M	H
Code	99231	99232	99233
Payment (\$)	30 - 40	50 - 65	60 - 75

PF = Problem focused EDF = Expanded problem focused D = Detailed
 SF = Straightforward L = Low M = Moderate H = High

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Surgeon Acceptance

- Benefits to surgeons
 - Less “surgical down time”
 - Fewer unplanned admissions
 - Better analgesia, fewer phone calls

Surgeon Acceptance

Common objections to overcome:

- “Blocks don’t work”
- “I want my patients asleep”
- “Blocks take too much time”
- “I don’t care what you do after surgery, I don’t want them before surgery”
- “My patient had renal failure and I think it’s because of your nerve block”

Surgeon Acceptance

How to be successful

Best Practice and Research Clinical Anaesthesiology 16(2):175, 2002

- ❑ **Quality cycle: Plan - Do - Check - Act**
- ❑ All involved health care disciplines participating
- ❑ Clinical pathway formulation and continual follow-up
Current Anesthesiology Reports 2:418-424, 2000
- ❑ Learn single-injection blocks first,
then advance to continuous catheter blocks
- ❑ Constant education efforts, literature review,
process and pathway improvements

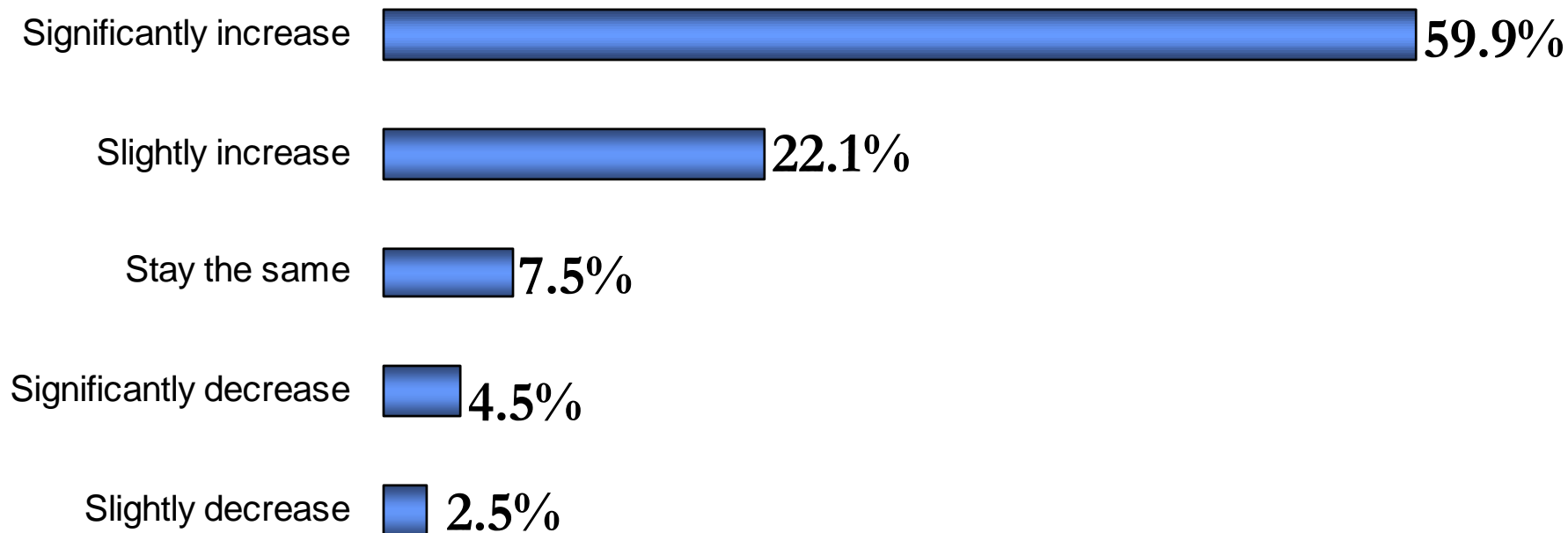
Administrative Help

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)
- ❑ **Hospital cost reductions**
 - ?Less forced overtime in OR (less surgical down time)
 - \$1.2M annual savings for 3000 orthopedic outpatients (estimate)
via PACU bypass and avoided hospital admission
- ❑ **Dramatic improvement in patient satisfaction**

The Future?

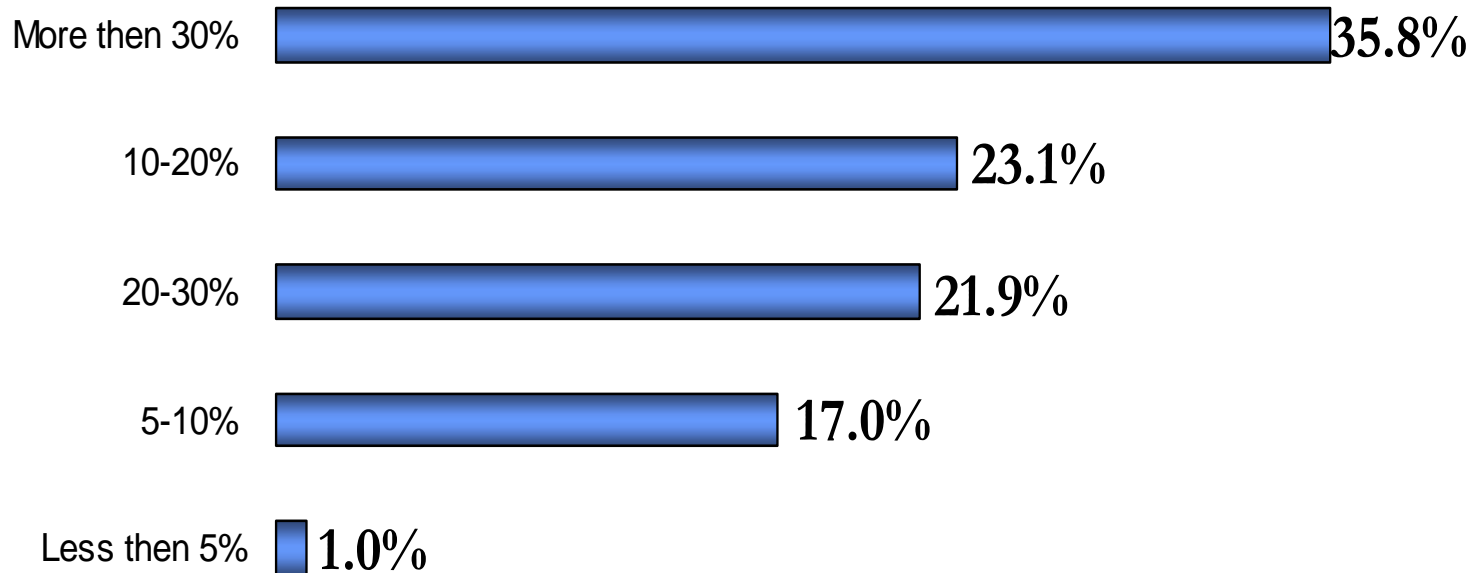
The use of regional anesthesia in the next 5 years will:



□ Total Votes: 199

The Future?

5 years from now, what percentage of nerve blocks will be CONTINUOUS?



□ Total Votes: 164

Summary, Discussion

- ❑ Learn the skills
- ❑ Pay attention to the equipment
- ❑ Build the team
- ❑ Change the process
- ❑ Pay attention to coding, reimbursement, and documentation
- ❑ Persevere

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