

first announcement

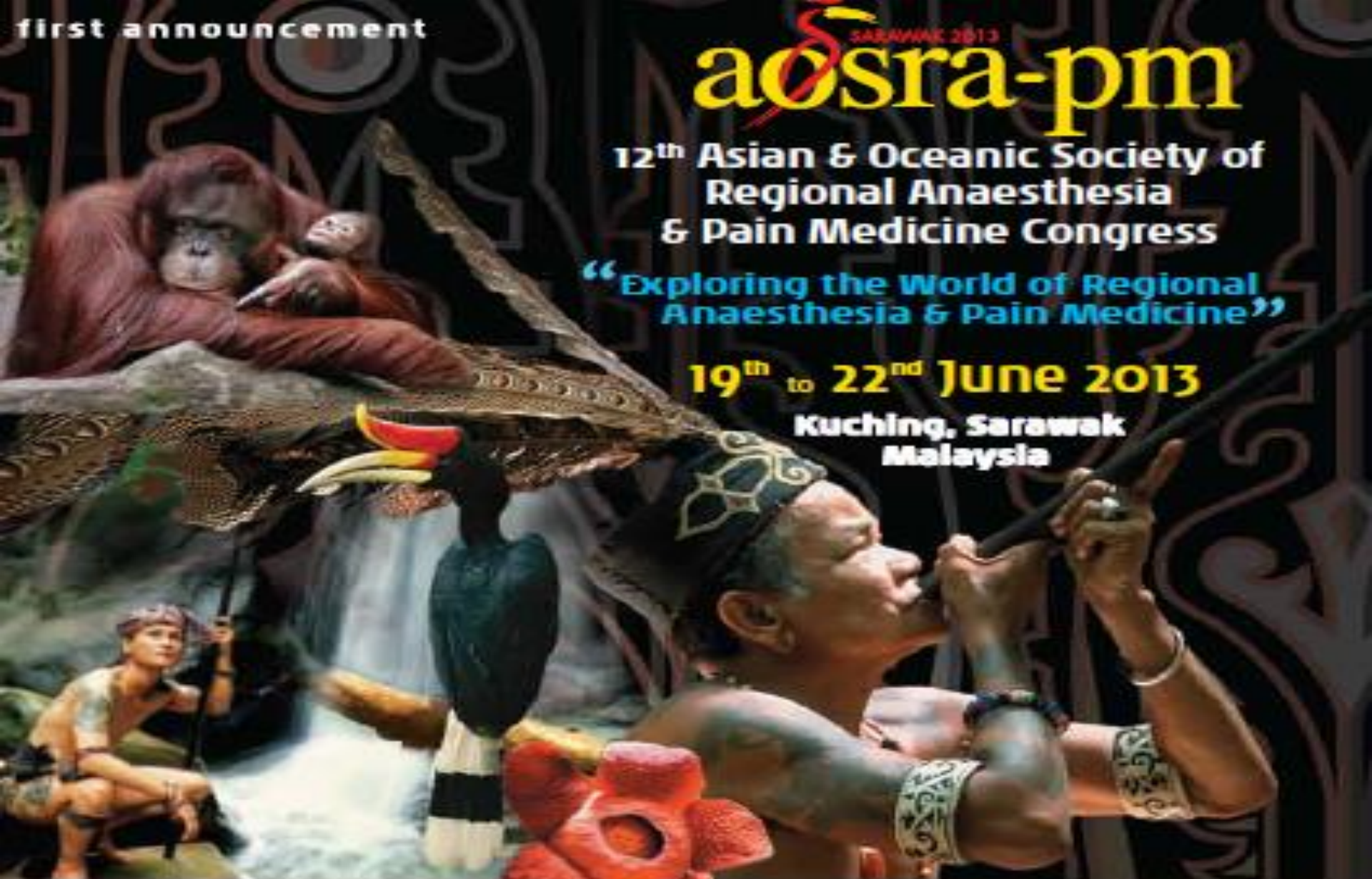
SARAWAK 2013  
**aosra-pm**

12<sup>th</sup> Asian & Oceanic Society of  
Regional Anaesthesia  
& Pain Medicine Congress

“Exploring the World of Regional  
Anaesthesia & Pain Medicine”

19<sup>th</sup> to 22<sup>nd</sup> June 2013

Kuching, Sarawak  
Malaysia



[www.aosra2013.org](http://www.aosra2013.org)



Malaysian Association  
for the Study of Pain



Asian and Oceanic Society  
of Regional Anaesthesia



Singapore Society  
of Anaesthesiologists



College of  
Anaesthesiologists

L'ANESTHÉSIE

RÉGIONALE

PAR

VICTOR PAUCHET

GASTON LABAT

ET

GASTON LABAT,

De la Faculté de Médecine de Paris,  
Lauréat de la Faculté des Sciences de Montpellier.

TROISIÈME ÉDITION REFONDUE

Avec 308 figures dans le texte.

PARIS

LIBRAIRIE OCTAVE DOIN

GASTON DOIN, ÉDITEUR

8, PLACE DE L'ODÉON, 8

1921

Tous droits réservés.

23676

Regional Anesthesia

Its Technic and Clinical Application

Perth

Regional Anaesthesia Group  
(PRAG)

By

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With a Preface by

William J. Mayo, M. D.

Mafeitzeral Mamat

Anaesthesia & Pain Medicine

Royal Perth Hospital

3 July 2012

With 315

Original Illustrations

PHILADELPHIA AND LONDON

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1922

REGIONAL  
ANESTHESIA  
AND PAIN  
MEDICINE

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Randomized Study of the Effect of Local Anesthetic  
Volume and Concentration on the Duration of  
Peripheral Nerve Blockade

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**PERTH REGIONAL ANAESTHESIA GROUP (PRAG)  
JOURNAL CLUB MEETING 3 JULY 2012**

# Background

## Introduction

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- Ultrasound guided technique had reduce the volume of local anaesthetic agent used to achieve a successful block.
- ? Unclear of block duration

# Hypotheses

Block duration depends on volume and concentration.

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# Study Design

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- Dual Centre
- Prospective
- Randomized
- Observer-Blinded trial

# Ethics approval

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- Northern Y Regional Ethics Committee, Hamilton, New Zealand.
- Australian and New Zealand Clinical Trials Registry (ACTRN12611000155998, February 2011).
- Written & oral informed consent as per Helsinki Declaration

# Recruitment

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- ASA I , II , III
- 16-80 year old
- Shoulder Surgeries
- February – December 2011

Southern Cross Brightside Hospital

North Harbour Hospital



# Study Interventions

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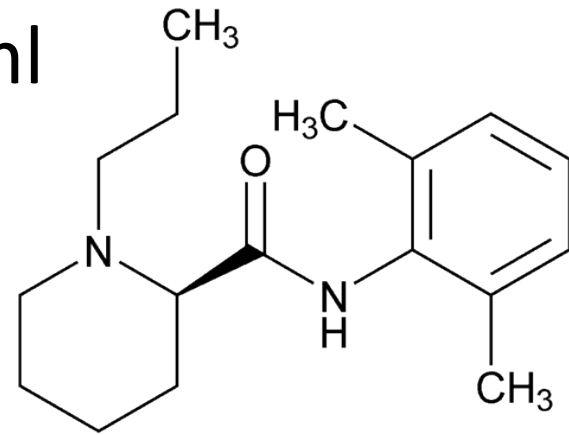
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## Interscalene Block

### Ropivucaine

- 0.75% 5 , 10 , 20 ml
- 0.375% 20, 40 ml



# End Points

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- **Primary:**  
Time to first shoulder pain
- **Secondary:**  
Numerical Rated Pain  
Tramadol Consumption  
Numerical Rated numbness  
Adverse effect in 24 hours

# Placement of catheter

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- Initial modified Superficial Cervical Plexus block given
- Ultrasound & Nerve Stimulator Needle used
- End point ultrasound: 10ml Dextrose 5% spread
- End point neurostimulator: Elicitation of motor response  $< 0.5\text{mA}$
- Catheter advanced 2-3cm from needle tip blindly

# Anaesthesia & Analgesia

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- GA with spontaneous breathing
- Desflurane Laryngeal Mask
- Ropivucaine infusion given before surgical incision
- Acetaminophen & Parecoxib
- Rescue Alfentanil for RR > 25/min

# Post Op

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- PACU strict exclusion criteria
- Elastomeric Ropivucaine infusion (PCRA) at the point of first shoulder pain.
- Multimodal Acetaminophen, Diclofenac, Tramadol.

# Results

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- 185 patients enrolled
- 61 excluded from analysis
- n=40 for 5ml group excluded (30% failure rate)
- Multivariate Regression Analysis – Cox proportional Hazards model

TABLE 1. Patient and Surgical Characteristics (n = 185)

	5 mL 0.75% (n = 40)	10 mL 0.75% (n = 41)	20 mL 0.375% (n = 35)	20 mL 0.75% (n = 33)	40 mL 0.375% (n = 36)
Male sex	24 (60)	30 (73)	22 (63)	24 (73)	29 (81)
Age, y	49 (12)	48 (15)	49 (16)	49 (14)	46 (18)
Weight, kg	83 (53–121)	85 (47–115)	83 (52–134)	88 (64–125)	87 (61–125)
Body mass index, kg/m <sup>2</sup>	28 (19–45)	29 (19–41)	27 (18–47)	29 (21–38)	29 (20–39)
Surgery					
Open rotator cuff repair	6	12	6	11	9
Arthroscopic rotator cuff repair	12	9	2	8	6
Arthroscopic stabilization	5	8	9	8	11
Arthroscopic lateral clavicle resection	4	3	2	1	2
Arthroscopic acromioplasty	8	6	9	3	3
Arthroscopic capsular release	2	1	1	0	1
Total shoulder joint replacement	1	1	4	0	2
Other	2	1	2	2	2

Values are mean (SD), mean (range), or n.

TABLE 2. Catheter Placement and Intraoperative and PACU Interventions (n = 185)

	5 mL 0.75% (n = 40)	10 mL 0.75% (n = 41)	20 mL 0.375% (n = 35)	20 mL 0.75% (n = 33)	40 mL 0.375% (n = 36)	<i>P</i> *
Ultrasound needle end point	38 (97)	40 (98)	32 (91)	32 (97)	34 (94)	0.77
Stimulated motor response: deltoid/biceps/triceps/none	11/9/4/16	11/10/2/18	3/8/6/18	8/6/3/16	11/5/2/18	0.30
Minimum stimulation threshold, mA	0.65 (0.5–0.80)	0.70 (0.50–0.80)	0.60 (0.3–0.7)	0.70 (0.50–0.80)	0.70 (0.39–0.80)	0.66
Intraoperative alfentanil bolus $\geq 1$	3 (8)	4 (10)	1 (3)	0 (0)	4 (11)	0.26
Surgery duration	75 (60–90)	80 (60–90)	80 (60–105)	80 (75–90)	75 (60–91)	0.73
PACU						
Exclusions						
PACU local anesthetic bolus	12 (30)	5 (12)	1(3)	2 (6)	3 (8)	0.006†
PACU catheter failure/reinsertion	0	1	0	0	2	
Protocol violation	0	0	1	0	1	
Lost to follow-up	0	2	1	1	1	

Values are n (%), n, or median (interquartile range).

\**P* values refer to a 5-group comparison.

†With group 5 mL excluded, *P* = 0.50.



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- Probability of pain as a function of time was associated with not only dose, but also volume corrected for concentration and concentration corrected for volume:

hazard ratio (95% confidence interval)

- for dose = 0.992 (0.987-0.997) (P = 0.002),
- volume = 0.959 (0.937-0.982) (P = 0.001),
- concentration = 0.852 (0.743-0.976) (P = 0.021).

# Volume

Increasing the volume of ropivacaine 0.375% from **10 to 40 mL** :

- increased median (quartiles) block duration from

**10.0** (9.5-11.5) to **15.0** (10.75-21) hours

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# Concentration

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Increasing the concentration of 20 mL ropivacaine from 0.375% to 0.75% :

- Increased the median (quartiles) block duration from

**10.75** (9.75-14.0) to **13.75** (10.5-21.0) hours.

TABLE 3. Postoperative Outcomes (n = 152)

	5 mL 0.75% (n = 28)	10 mL 0.75% (n = 33)	20 mL 0.375% (n = 32)	20 mL 0.75% (n = 30)	40 mL 0.375% (n = 29)	<i>P</i> *
Tramadol consumption	0 (0–1)	0 (0–1)	0 (0–1)	0 (0–1)	0 (0–1)	0.50
Ropivacaine boluses	3 (2–4)	3 (1–5)	3 (2–4)	3 (2–5)	2 (1–4)	0.62
Worst shoulder pain NRS	3 (2–6)	5 (3–6)	4 (3–6)	4 (3–6)	3 (3–5)	0.42
“Average” shoulder pain NRS	1 (0–3)	2 (0–3)	2 (1–3)	2 (1–3)	2 (1–3)	0.98
Hand numbness NRS	9 (6–10)	8 (5–10)	7 (5–8)	8 (6–10)	8 (7–10)	0.17
Hand weakness NRS	8 (5–10)	7 (3–9)	7 (5–9)	7 (5–10)	8 (5–10)	0.85
Adverse effects**	9 (32)	12 (36)	9 (28)	17 (56)	12 (41)	0.14
Satisfaction NRS	9 (8–10)	10 (8–10)	10 (8–10)	9 (7–10)	10 (9–10)	0.16

Values are n (%) or median (interquartile range).

\**P* values refer to comparisons of the 4 groups excluding 5 mL 0.75%. Respective *P* values were similar with inclusion of the 5 mL group.

NRS indicates numerical rating score (0–10, 0 = 0 = no pain, hand numbness/weakness, very unsatisfied; 10 = worst imaginable pain, hand numbness/weakness, very satisfied).

\*\*Adverse effects included “breathlessness” or “difficulty taking a deep breath.”

# Discussion

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- The first study to assess duration of block associated with volume & concentration.
- Interest due to reported cases and studies of ultra-low dose volume used. However, non analysed duration as outcome.

# Discussion

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- Despite clear association with volume & concentration, clinical relevance can be questioned.

# Discussion

theoretical reduction in the local anaesthetic systemic toxicity risk from lower volumes and concentrations outweighs the downside of shorter block duration, even though published clinical evidence does not support this principle.

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# Discussion

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The relatively modest effect of both volume and concentration could be interpreted to mean that the only way to significantly prolong block duration is through perineural catheter placement



# Critique

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- Exclusion of the 5ml group
- Technique of local anaesthetic agent deposition
- Secondary outcome analysis – not powered to justify

# Summary

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In summary, this study found a clear association between local anesthetic volume, concentration (and dose), and the duration of interscalene block, findings that have particular relevance for the current trend in ultrasound-guided regional anesthesia of administering low local anesthetic volumes.

A photograph of a person's silhouette in the foreground, looking out over a city skyline at sunset. The sky is a warm, golden yellow, and the city buildings are silhouetted against it. The water in the foreground is dark and reflects the light. The overall mood is contemplative and serene.

# THANK YOU

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