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Jonathan Shaw

Henry Ford Health System, JSHAW5@hfhs.org

Chad Mahan

Justin Jabara

Henry Ford Health System, jjabara1@hfhs.org

Jason J. Davis

Henry Ford Health System, Jdavis7@hfhs.org

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# MEPIVACAINE SPINAL ANESTHESIA FACILITATES SHORTER LENGTH OF STAY AND FEWER URINARY COMPLICATIONS IN TOTAL HIP ARTHROPLASTY COMPARED TO BUPIVACAINE

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**JONATHAN SHAW, M.D., M. CHAD MAHAN, M.D., JUSTIN JABARA, B.S., AND JASON DAVIS, M.D.**

HENRY FORD HEALTH SYSTEM, DEPARTMENT OF ORTHOPAEDIC SURGERY (1,2,4),  
WAYNE STATE MEDICAL SCHOOL (3).



# DISCLOSURES

- No relevant disclosures



# BACKGROUND

- Rapid rehab THA
  - Surgical technique
  - Perioperative protocol
- Outpatient surgery increasing
- Spinal anesthesia mainstream
- Paucity of evidence - optimal anesthetic for rapid rehab/ambulatory THA.



# SPINAL ANESTHESIA

- Low cost (\$5)
- No airway manipulation
- Sufficient/reliable anesthesia for the duration of the procedure
- Rapid return of motor and sensory function
  - Early mobilization
- Safe rapid discharge with low risk of readmission
- Minimal risk of side effects such as urinary retention and transient neurologic symptoms (TNS).



# PURPOSE:

To compare **spinal mepivacaine vs bupivacaine:**

- Assess for use in ambulatory total hip arthroplasty
- Recovery profile
  - Urinary retention/incontinence
  - Pain (VAS? Opioid?)
  - Nausea/vomitting
  - TNS
  - Length of stay



# METHODS:

- IRB approval
- Retrospective review of prospectively collected data
- Single surgeon experience (12/2015 – 3/2018)
- Inclusion criteria
  - Primary THA for OA
  - Spinal anesthesia
- Exclusion criteria
  - PONV
  - Urinary retention/BPH



# METHODS

- **312 primary THA patients under spinal/sedation:**
  - 116 received 3.0-3.4 mL of 2% mepivacaine
  - 195 received 10.5-12mg 0.75% bupivacaine
- Patients otherwise followed rigid THA pathways
  - Multimodal oral pain regimen
  - Periarticular injection
  - No foley catheters
  - Early mobilization

	Bupivacaine 0.75% vial		Mepivacaine 2% vial	
Height	Volume (mL)	Dose (mg)	Volume (mL)	Dose (mg)
4'10" – 5'7"	1.4	10.5	3	60
>5'7"	1.6	12	3.4	68



# METHODS

- **Outcome measures by phase of care**
  - Pain VAS
  - Opioid consumption
  - N/V
  - Urinary retention
  - TNS
  - Discharge readiness
  - LOS



# DEMOGRAPHICS

Variable	All (N= 311)	Mepivacaine (N= 116)	Bupivacaine (N= 195)	<i>P</i>
<b>Age</b>	63.7 ± 11.0	62.8 ± 10.6	64.3 ± 11.3	.240
<b>Gender</b>				
Male	137 (44%)	52 (45%)	85 (44%)	.832
Female	174 (56%)	64 (55%)	110 (56%)	
<b>Race</b>				
Caucasian	225 (72%)	86 (74%)	139 (71%)	.954
Black	68 (22%)	24 (21%)	44 (23%)	
Unknown	12 (4%)	4 (3%)	8 (4%)	
Asian	4 (1%)	1 (1%)	3 (2%)	
Hispanic	2 (1%)	1 (1%)	1 (1%)	
<b>Smoker</b>				
Never	161 (52%)	60 (52%)	101 (52%)	.780
Previous	112 (36%)	40 (34%)	72 (37%)	
Current	38 (12%)	16 (14%)	22 (11%)	
<b>Body mass index</b>	30.3 ± 6.2	30.0 ± 5.8	30.5 ± 6.4	.461
<b>ASA</b>				
1	10 (3%)	4 (3%)	6 (3%)	.450
2	127 (41%)	53 (46%)	74 (38%)	
3	168 (54%)	56 (48%)	112 (57%)	



# DISCHARGE/LENGTH OF STAY

Variable	Response	All (N= 311)	Mepivacaine (N= 116)	Bupivacaine (N= 195)	P
Time in the PACU (minutes)	N Mean ± SD		116 114.9 ± 47.8	195 115.3 ± 45.1	.802
Hours inpatient	N Mean ± SD	311 17.6 ± 4.6	116 25.9 ± 14.1	195 35.7 ± 17.5	<.001
Length of stay (days)	N Mean ± SD	311 1.1 ± 0.7	116 0.9 ± 0.7	195 1.3 ± 0.7	<.001
Same-day discharge	No	276 (89%)	89 (77%)	187 (96%)	<.001
	Yes	35 (11%)	27 (23%)	8 (4%)	



# LENGTH OF STAY - MULTIVARIATE

Predictor	Adjusted LS Means (SE) of LOS	<i>P</i>
Bupivacaine	1.19 (0.15)	<.001
Mepivacaine	0.90 (0.15)	

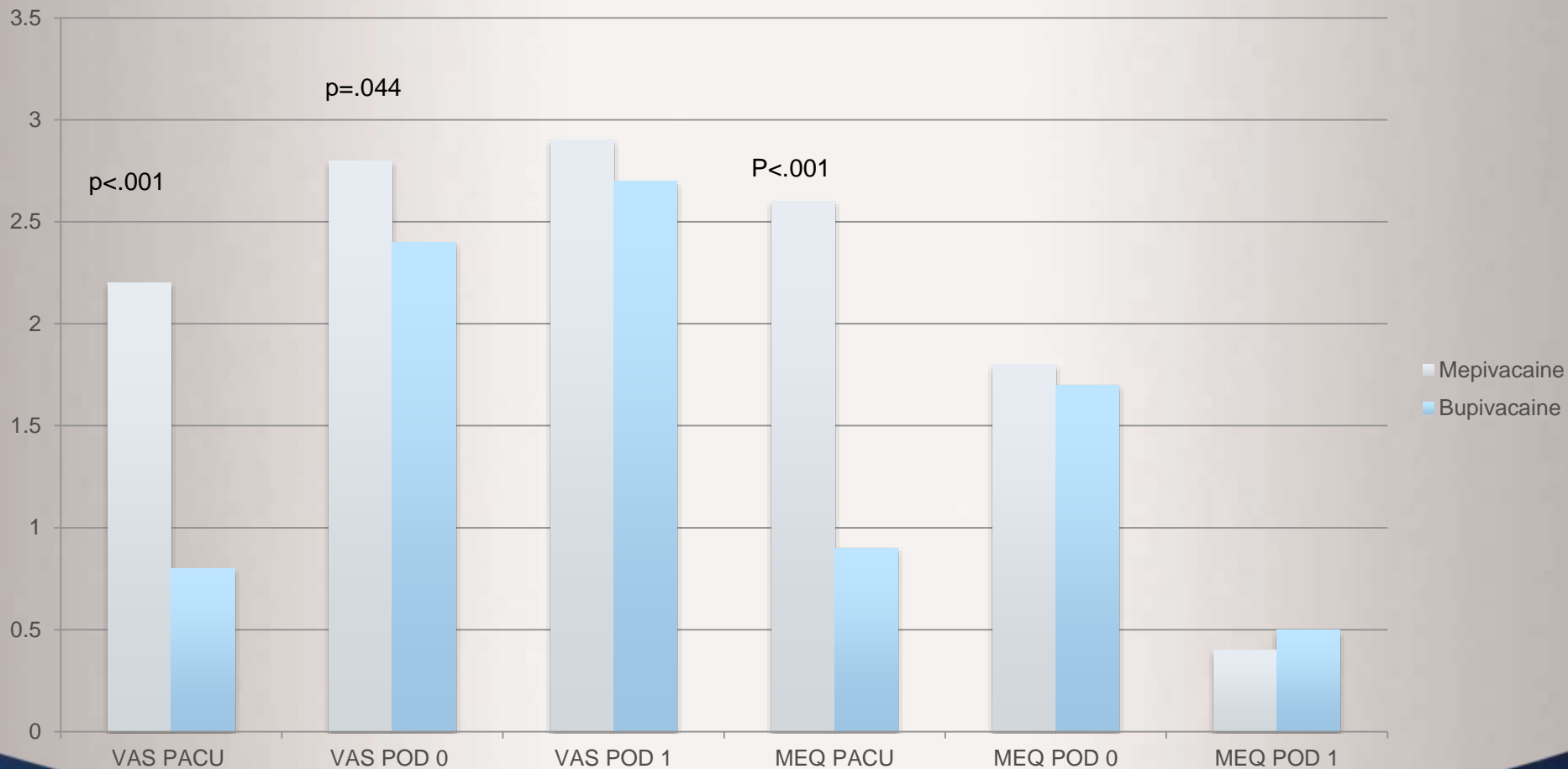
Predictor	Adjusted LS Means (SE) of Hours Inpatient	<i>P</i>
Bupivacaine	45.79 (3.94)	<.001
Mepivacaine	38.20 (4.14)	

Predictor	Adjusted OR (95% CI) for Same-Day Discharge = Yes	<i>P</i>
Bupivacaine	Ref	<.001
Mepivacaine	9.67 (3.72, 25.15)	



# PAIN CONTROL



# PAIN CONTROL - MULTIVARIATE

<b>Predictor</b>	<b>Adjusted LS Means (SE) of VAS</b>	<b>P-Value</b>
Bupivacaine	1.96 (0.24)	0.523
Mepivacaine	2.65 (0.25)	

<b>Predictor</b>	<b>Adjusted LS Means (SE) of MEQ</b>	<b>P-Value</b>
Bupivacaine	0.64 (0.22)	<b>&lt;0.001</b>
Mepivacaine	1.17 (0.23)	



# URINARY DATA

## DETRUSOR LAST TO RETURN AFTER SPINAL

Variable	Response	All (N= 311)	Mepivacaine (N= 116)	Bupivacaine (N= 195)	<i>P</i>
Urinary catheter	No	299 (96%)	116 (100%)	183 (94%)	<b>.009</b>
	Yes	11 (4%)	<b>0 (0%)</b>	11 (6%)	

\*Significantly **less foley placement** needed in the mepivacaine group.



# COMPLICATIONS

- Zero episodes of TNS or anesthesia conversions

<b>Variable</b>	<b>Response</b>	<b>All (N= 311)</b>	<b>Mepivacaine (N= 116)</b>	<b>Bupivacaine (N= 195)</b>	<b><i>P</i></b>
Postoperative event	None	266 (87%)	94 (84%)	172 (88%)	.598
	Emergency	29 (9%)	13 (12%)	16 (8%)	
	Department Visit				
	Readmission	8 (3%)	4 (4%)	4 (2%)	
	Fracture	4 (1%)	1 (1%)	3 (2%)	



## **Mepivacaine Spinal Anesthesia Facilitates Rapid Recovery in Total Knee Arthroplasty Compared to Bupivacaine.**

Mahan MC<sup>1</sup>, Jildeh TR<sup>1</sup>, Tenbrunsel TN<sup>2</sup>, Davis JJ<sup>1</sup>.

- Shorter LOS
- Less urinary retention
- No difference in pain control (VAS/Opioid)
- No difference in PT performance
- No intubations
- No TNS episodes



# CONCLUSION

- Mepivacaine is a suitable anesthetic for rapid recovery total hip arthroplasty
- Greater chance of same day discharge
- Shorter LOS
- Less urinary retention
- Significantly more pain in PACU, does not reach MCID
- No TNS symptoms

