MINERVA MEDICA

VOL. 108 · SUPPL. 2 · No. 2 · APRIL 2017

NYSORA 2017 ABSTRACT BOOK

3rd Nysora International Symposium

Dubai, March 23-25, 2017

15th Nysora Annual Symposium

New York, September 23-25, 2016

EDIZIONI · MINERVA · MEDICA

PUBBLICAZIONE PERIODICA BIMESTRALE - POSTE ITALIANE S.P.A. - SPED. IN A. P. D.L. 353/2003 (CONV. IN L. 27/02/2004 N° 46) ART. 1, COMMA 1, DCB/CN - ISSN 0026-4806 TAXE PERÇUE

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ABSTRACTS
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NYSI 5
Comparative Evaluation of Ultrasound Guided Supraclavicular and Infraclavicular Venous Catheterization in Adult Patients

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Introduction: The subclavian vein (SCV) is preferred for central venous catheterizations due to lower rates of infection, reduced incidence of mechanical complications and thrombosis.However till date no study has compared the relative advantage or safety of ultrasound guided infraclavicular and supraclavicular cannulations in adults.In our study we compare ultrasound-guided supraclavicular and infraclavicular approaches for subclavian venous catheterization in adults.

Objectives: Primary objective: To compare puncture time of subclavian vein using ultrasound-guided supraclavicular and infraclavicular approaches in adults. **Secondary objectives:**

- To compare total access time using both the techniques.
- To compare first attempt success rate.
- To compare the quality of needle visualization.
- To compare the immediate (mechanical) and delayed complication rates.

Methods: The study was conducted in a tertiary care hospital after approval of Ethics Committee. Randomization was done using computer generated random number tables and the allocations were concealed in sequentially numbered, sealed, opaque envelopes. All the randomised patients were allocated into two groups of 48 each: SC Group (n=48) : US guided right supraclavicular approach to subclavian cannulations. IC Group (n=48) : US guided right infraclavicular approach to subclavian cannulations.

Results: See Table NYSI 5: Comparison Between USG guided SC and IC cannulation

Conclusions: In conclusion, our study shows the Supraclavicular approach to be significantly superior to Infraclavicular approach to subclavian vein in terms of number of attempts required for cannulation.

TABLE NYSI 5.—*Comparison between USG guided SC and IC cannulation.*

	SC group (N.=45)	IC group (N.=45)	P value
Quality of needle visualisation Good Poor	27 18	21 24	0.29
First attempt success rate	82.2% (37 out of 45)	62.2% (28 out of 45)	0.26
@Puncture time (in seconds)	15 (9-39)	21 (5-80)	0.21
#Total access time (in seconds)	99.11±34.66	103.44±50.27	0.98
#Attempts of needle puncture	1.20±0.46	1.40±0.54	0.04
#Attempts of guidewire insertion	1.07±0.25	1.16±0.37	0.18
#Catheter insertion length (in cm)	11.49±1.04	12.62±1.37	<0.001

#Values expressed as mean±SD; @Value expressed as median (IQR); quality of needle visualisation expressed as number of subjects. P value<0.05 is significant. SC-Supraclavicular, IC-Infraclavicular

NYSI 6
Comparison of Continuous Wound Catheter Infusion *versus* Continuous Epidural Infusion in Upper Abdominal Surgery

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Introduction: The technique of continuous wound infusion by placing a multi-holed catheter has been gaining popularity and has proven efficacious in many surgeries including cardiothoracic, pelvic, breast and spine surgeries, with contradictory results in abdominal surgeries.

Objectives: To compare the efficacy of continuous wound catheter infusion (CWI) with continuous epidural infusion (CEI) in upper gastrointestinal surgery.

Methods: 40 ASA I to III patients aged 18 years to 65 years who consented for this non inferiority trial, undergoing upper abdominal surgery via upper midline incision, were randomized into two groups. Group I - Continuous Wound Infusion (CWI) group in which wound catheter was placed in the musculo fascial layer

TABLE NYSI 6.—*Postoperative Numerical Rating Scale (NRS) score at rest and on movement at different time points.*

NRS scores	CEI group	CWI group	P value
At 4h-rest	1.65±0.98	1.95±1.54	0.7934
At 24h-rest	1.1±0.78	1.2±0.95	0.7794
At 48h-rest	0.55±0.6	0.8±0.89	0.4784
At 4h-movement	2.6±1.46	2.9±1.9	0.9563
At 24h-movement	1.55±1.19	1.6±1.27	0.9340
At 48h-movement	0.9±0.91	1.1±0.96	0.5226

CEI-continuous wound infusion; CWI-continuous wound infusion

in the deep subcutaneous plane of incision and Group II - Continuous Epidural Infusion (CEI) group in which thoracic epidural with catheter was placed. Both the groups received 0.2% ropivacaine infusion at 10mL/h following a 10mL bolus. The primary outcome was to compare numerical rating scale (NRS) score postoperatively between these two groups at rest and on movement. Secondary objective was to determine the total morphine consumption, patient satisfaction and other side effects.

Results: There was no significant difference in pain scores both at rest and on movement between the two groups at all time points (Table NYSI 6). Morphine consumption although higher in the CWI group at all the time points, was not statistically significant. Blood pressure was significantly lower in CEI group in the first 24h post-surgery. Wound Soakage with serous discharge was noted in all candidates in CWI group (P value<0.001). Duration of surgery had a positive correlation with pain scores in CWI group (P value<0.001).

Conclusions: Analgesia provided by continuous wound infusion catheter is not inferior to continuous epidural infusion in upper gastrointestinal surgery done through upper midline incision with better preservation of hemodynamic parameters.

NYSI 7
Efficacy of Point of Care Inferior Vena Cava Ultrasonography Guided Volume Repletion in Preventing Spinal Hypotension in Elective Surgical Patients

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Introduction: Spinal anesthesia is commonly associated with hypotension due to decrease in systemic vascular resistance and reduced venous return which in turn reduces cardiac output. Assessing fluid responsiveness by inferior vena cava (IVC) collapsibility index (CI) has been demonstrated as a reliable indicator in critical care and perioperative patients.

Objectives: The objective of the study was to determine the efficacy of point of care IVC ultrasound in guiding volume repletion to prevent post spinal anesthesia induced hypotension and to avoid volume overload in elective surgical patients.

Methods: After obtaining institutional ethical committee approval, 100 adult patients belonging to American Society of Anesthesiologists(ASA) physical status I to III scheduled for elective surgery under spinal anesthesia were recruited and divided into two groups, group E (N.=50) was managed with fluids based on standard institutional practice while in group U (N.=50), IVC ultrasonography was done to assess the CI of IVC during a respiratory cycle before spinal anesthesia and thereafter serial determinations were done until 1 hour. CI of ≥40% was taken as the threshold for fluid responsiveness and 200 mL of crystalloid was administered. Hypotension was defined as reduction in mean arterial pressure (MAP) >30% from baseline or <60 mmHg. Outcomes measured were rate of arterial hypotension and total volume of intravenous fluid infused.

Results: 85 patients were analyzed and failure rate of IVC ultrasonography was 10%. Rate of significant arterial hypotension was 37.5% and 15.5% and total volume of intravenous fluid infused was 1150 mL and 400 mL in group E and U respectively.

Conclusions: Point of care ultrasound assessment of IVC CI is an effective method for guiding titrated volume repletion to prevent post spinal anesthesia induced significant hypotension and to avoid volume overload in elective surgical patients.

NYSI 8
Addition of Liposome Bupivacaine in Interscalene Brachial Plexus Block Lowers Postoperative Pain Up to 7 Days After Rotator Cuff Surgery

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Introduction: Surgical repair of the rotator cuff is frequently associated with significant pre and postop-

TABLE NYSI 7.—*Demographic data and outcome measures.*

	Empirical fluid group (Group E) (N.=40)	Ultrasound guided fluid group (Group U) (N.=45)	P value
Age (yr)	49.3±13.58	48.7±13.8	> 0.05
Gender (male/female)	22/18	24/21	> 0.05
BMI (kg/m²)	24.2±3.7	25.8±4.2	> 0.05
ASA (I/II/III)	25/15/0	30/15/0	> 0.05
Baseline Heart rate (beats/min)	74±11	71±12	> 0.05
Baseline MAP(mmHg)	95.6±10.4	99.2±9	> 0.05
Number of patients on anti hypertensive therapy with Coronary artery disease	10/0	12/0	> 0.05
Rate of significant arterial hypotension (%)	37.5%	15.5%	0.02*
Total volume of IV fluid infused (mL) Median (Inter Quartile range)	1150 (800 to 1600)	400 (200 to 800)	0.0001*

erative pain. Dexamethasone and clonidine have been used in interscalene brachial plexus block (ISBPB) to extend the duration of analgesia, yet these additives are not FDA approved and have not been consistent in prolonging postoperative analgesia.1 We examined the efficacy of liposome bupivacaïne (LB), when added to bupivacaïne (Bupi), to provide extended analgesia in the first postoperative week in ISBPB for rotator cuff surgery.

Objectives: Long acting local anesthesia.

Methods: In this IRB & FAMHP approved single centre, double blinded study, 40 patients having rotator cuff repair were randomized to receive ISBPB with 15 mL of Bupi 0.25% (Bupi; N.=20) or a mixture of 5 mL Bupi 0.25% and 10 mL LB 1.33% (Bupi+LB; n=20). All patients received multimodal postoperative analgesia. Numeric Rating Scale (NRS) scores were obtained for pre and postoperative pain at rest and with movement of the shoulder. Differences from preoperative pain scores were calculated for postoperative hours 36, 48, 72, 96 and 7 d.The effect of Bupi+LB on pain at rest and with movement was examined in regression models that accounted for repeated measures in the first postoperative week.

Results: Mean NRS scores preoperatively were similar in both groups at rest (2.8;3.4) and with movement (5.85;6.5). Pain at rest and with movement were lowered for the group that received Bupi+LB compared to Bupi. Overall difference from preoperative pain was 0.4±0.6 (Bupi) *vs.* 1.5±0.6 (Bupi+LB) for pain at rest (multivariate P=0.032). Overall difference from preoperative pain was 0.9±0.5 *vs.* 2.7±0.5, respectively, for pain with movement (multivariate P=0.014). The effect for both pain at rest and with movement appeared to be decreased approximately two NRS points and was most notable at 96 h.

Conclusions: The addition of LB to Bupi significantly decreased postoperative pain compared to baseline up to 7 postoperative days both at rest and with movement

NYSI 10
Validation of an Arabic Version of the American Pain Society-Patient Outcome Questionnaire

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Introduction: The American Pain Society-Patient Outcome Questionnaire-Revised (APS-POQ-R) was designed to assess the quality of postoperative pain management in hospitalized patients over 24 hours. It measures 5 domains for pain outcomes; pain severity, interference with function and sleep, adverse effects, perception of pain control, and use of alternative methods for pain control.

Objectives: To validate the APS-POQ-R Arabic version for the purpose of qaulity improvement, clinical research and clinical practice.

Methods: The work group that developed the APS-POQ-R encourages its use in local clinical settings. The instrument is translated into 11 languages including Arabic [2]. We piloted tested the survey in 25 Arabic fluent patients before proceeding with a validation study. The Arabic APS-POQ-R was then completed by 200 Egyptian patients at Aswan University Hospital, Aswan, Egypt, 24 hours after surgery. Internal consistency reliability (Cronbach's alpha) was measured, and group comparisons and correlations conducted.

Results: Two-hundred patients (males n=79, 40%) completed the survey instrument. Means and standard deviations (STD) for age and BMI were (43±17) and (28±4), respectively. Worst pain over 24 hours was significantly higher (P<0.01) for orthopedic surgery (n=49, 24%) compared to general abdominal, urologic and gynecologic surgery (n=128). Patient satisfaction was positively correlated with perception of pain relief, r=0.634, P<0.001 (figure 1A), and negatively correlated with the percentage of time in severe pain, r=-0.602, P<0.001 (figure 1B). Acceptable reliability was demonstrated (Cronbach alpha = 0.78).

Conclusion: The Arabic APS-POQ=R version was found to be reliable and valid in detected significant differences in the sample. These findings extend the research on the APS-POQ-R in culturally diverse populations.

NYSI 11
Effect of Palonosetron on Postoperative Nausea and Vomiting after Total Knee Arthroplasty under Spinal Anesthesia

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Introduction: Preemptive multimodal pain protocols used in total knee arthroplasty (TKA) provoke emetic events after TKA.The antiemetic efficacy achieved by palonosetron prophylaxis in high risk patients remains unclear.

Objectives: This study was designed to investigate whether palonosetron prophylaxis reduces postoperative nausea and vomiting (PONV) in patients managed with multimodal analgesic regimens.

Methods: We randomized 115 patients undergoing TKA to receive either palonosetron (palonosetron 0.075 mg i.v.; N.=59) or no antiemetic prophylaxis (normal saline i.v. control group, N.=56). All patients were given spinal anesthesia, continuous femoral nerve block, fentanyl-based intravenous patient controlled analgesia.The incidence of nausea and vomiting, severity of nausea, pain levels and opioid consumption, requirement for rescue antiemetics and complete response were evaluated

during three periods (0-2, 2-24, and 24-48 h postoperatively).

Results: The incidence of PONV was lower in the palonosetron group compared to the control group (22.0% vs 41.1%, P=0.028), especially 2-24 h (20.3% vs 39.3%, P=0.026) after surgery. The severity of nausea was lower in the palonosetron group. Complete response rate and satisfaction score was higher in palonosetron group.

Conclusions: Palonosetron reduced postoperative nausea and vomiting in the first 48 h, especially during the 2-24 h after surgery. Based on our results, palonosetron can be considered a promising antiemetic agent as one of comprehensive PONV protocol.

NYSI 12
Comparative Study of Intraperitoneal Instillation of Bupivacaine and Ropivacaine for Postoperative Analgesia in Patients Undergoing Laparoscopic Cholecystectomy

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Introduction: Laparoscopic cholecystectomy is now the gold standard for treatment of symptomatic gallstones. After this surgery patients suffer visceral and shoulder pain secondary to peritoneal insufflation. Use of intraperitoneal instillation of local anaesthetics has been used to reduce postoperative pain and decreases the need for postoperative analgesics.

Objectives: To evaluate the efficacy and to compare Intraperitoneal Instilllation of Bupivacaine and Ropivacaine for postoperative analgesia in patients undergoing Laparoscopic Cholecystectomy in relation to :

- To study the postoperative analgesic effect.
- Duration of postoperative analgesia (hours).
- To assess the need of rescue analgesics in postoperative in both groups.
- Haemodynamic changes.

Methods: After ethical committee's clearance and informed consent,60 patients with symptomatic cholelithiasis, aged 18-65 years, of either gender, ASA grades I to III scheduled for laparoscopic cholecystectomy were included. Patients were randomized into two groups with 30 patients in each group: Group A: Patients who will be given 20 mL of 0.5 % Bupivacaine intraperitoneally after cholecystectomy. Group B: Patients who will be given 20 mL of 0.5 % Ropivacaine intraperitoneally after cholecystectomy.

Results: Pulse rate, Systolic blood pressure and Diastolic blood pressure were comparatively lower in Group-B than in Group-A. The VAS score was significantly lower in Group-B from postoperative 5th hr to 12th hr. Rescue analgesia was given when VAS was > 6 cms. VRS score was significantly lower in Group-B from postoperative 7th hr, showing longer duration of analgesia in this group. The rescue analgesia requirement was also less in Group-B.

Conclusions: I, hereby conclude that the instillation of Bupivacaine and Ropivacaine intraperitoneally is an effective method of postoperative pain relief in laparoscopic cholecystectomy. It provides good analgesia in immediate postoperative period with Ropivacaine providing longer duration of analgesia.

NYSI 13
A Retrospective Study on Intraoperative Cardiac Arrest in a Tertiary Hospital: Characteristics of Arrest and Predictors for 3-Month Mortality after Arrest in Adults

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Introduction: Predictive factors related to clinical outcomes after intraoperative cardiac arrest were not fully established.

Objectives: The objective of this study was to identify factors related to 3-month mortality after arrest in patients with intraoperative cardiac arrest.

Methods: The electronic medical records of 238,648 adult patients who underwent a surgical procedure under general anesthesia, regional anesthesia, or monitored anesthetic care from Jan 2005 to Dec 2014 were retrospectively reviewed. This retrospective study was approved by the Institutional Review Board of Seoul National University Hospital (number: 1612-049-813).

Results: Intraoperative cardiopulmonary resuscitation due to cardiac arrest was performed in 50 patients (21/100,000 surgeries). 19 (38%) patients died in operating room. 31 (62%) patients died at post-arrest 3 months. Duration of cardiac compression (1.106 [1.017-1.202], P=0.019), anesthesia-related arrest (0.014 [0.000-0.625], P=0.028), and initial cardiac rhythm of VT/VF (0.042 [0.004-0.450], P=0.009) were independent factors for 3-month mortality after arrest. 15 patients, of 31 patients who were successfully resuscitated from intraoperative cardiac arrest, showed an unfavorable clinical outcome (cerebral performance category score 3-5) at post-arrest 3 months. Emergent surgery (8.591 [1.059-69.694], P=0.044) and inotropes or vasopressor continuous infusion in intensive care unit (14.625 [1.272-168.155], P=0.031) were predictive of an unfavorable 3-month clinical outcome in such patients.

Conclusions: Long duration of cardiac compression, non-shockable cardiac rhythm, and non-anesthetic cause for arrest were associated with 3-month mortality after intraoperative cardiac arrest. Also, emergent surgery and inotropes or vasopressor continuous infusion in intensive care unit were related to unfavorable clinical outcomes at post-arrest 3 months in patients who were successfully resuscitated from intraoperative cardiac arrest.

NYSI 14

Longer Utilization of Non-opioid Treatment Options in Developing Country than in the USA Prior to Opioid Prescription for Patients with Non-Cancer Pain

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Introduction: Opioids become a primary pain medication prescribed in developed countries. In the USA, prescription writing of opioids has increased 300 percent in the past decade.

Objectives: The purpose of this prospective study was to compare the utilization of other pharmacological and non-pharmacological treatments between a developing country (Serbia) and the USA prior to introducing opioids.

Methods: This study was approved by the ethics committee Medical School University of Belgrade, Serbia, and Advocate Healthcare IRB, Chicago, IL, USA. We enrolled 84 patients from Serbia and 118 from the USA, who are diagnosed with chronic non-cancer pain and are taking opioid medications for pain management.

Results: of this preliminary study showed that patient population talking opioids in the USA was much younger (average age 50.2±13.8 *vs.* 68.5±12.8, $p<0.05$). The gender ratio between males and females was similar, in Serbia 42.9% were males and 57.1% females, and in the USA 45.8% were males and 54.2% females. The most frequent location of pain was neck and low back pain in both countries (78% in Serbia and 72.7% in the USA). The average pain at rest was higher in Serbia (8.7±1.7) than in the USA (5.3±2.2) and during movement in Serbia (7.3±2.1) than in the USA (6.9±2.6). In the USA most frequently used opioid was hydrocodone by 62%, followed by tramadol by 24%, hydromorphone by 16%, oxycodone by 12% and fentanyl by 8% of study patients. In Serbia oxycodone was used by 85.7%, tramadol by 7.1% and fentanyl by 3.6%, and tapentadol by 3.6% of study patients. Patients in Serbia have used NSAIDs longer (42.4±5.3 months) than patients in the USA (33.6±6.9 months) prior to opioid use, with the similar average effectiveness 26.4 *vs.* 23.4%. Patients in Serbia also used other non-pharmacological treatments (physical therapy, chiropractor manipulation, massage, acupuncture, TENS, etc.) much longer (average 28.3±6.5 months) than in the USA (average 19.1±9.6 months) prior to opioid use ($P<0.05$).

Conclusions: The results of this preliminary study showed longer utilization of NSAIDs and other non-pharmacological therapies prior to opioid prescription in a developing country when compared to the USA.

ABSTRACTS
15th NYSORA ANNUAL SYMPOSIUM
New York, September 23-25, 2016

NYSORA-O-1
Effect of Dexmedetomidine on Sedation and Analgesia in Supraclavicular Brachial Plexus Block in Children – A Prospective Randomized, Double Blinded Study

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Introduction: Brachial plexus block is a well accepted technique in children for upper limb procedures. Several adult human studies have concluded the superiority of dexmedetomidine as an adjuvant to local anaesthetic during brachial plexus block. But similar evidence is lacking in pediatric population.

Objectives: Thus we conducted this prospective, randomized, double blind clinical efficacy study to evaluate the effectiveness of adding dexmedetomidine to bupivacaine in supraclavicular brachial plexus block in children, in terms of duration of analgesia, intraoperative sedation and postoperative analgesic requirement.

Methods: After institutional ethics committee approval and obtaining written informed consent from the parents, fifty children of age 1-12 years, posted for elective upper limb orthopedic surgery, were randomly allocated into two groups of 25 each. All the children were premedicated with ketamine (4 mg/kg) and glycopyrolate (0.2 mg) IM 15 minutes prior to shifting inside the operation theatre. The children received 0.25% bupivacaine (1 mL/kg) along with either 1 mL saline (control group) or 1 µg/kg of dexmedetomidine (study group) as per their group and brachial plexus block was given with supraclavicular approach, using anatomical land mark approach. Heart rate, blood pressure and peripheral oxygen saturation were noted every 5 min for first 30minutes and then every 15 minutes till the end of the procedure. Duration of block and the total dose of midazolam administered, based on Ramsay sedation score of 3-4 were also recorded. In the postoperative period, Pain and sedation was assessed using CHEOPS scale. Rescue analgesia with inj.fentanyl 1 µg/kg was given when CHEOPS scale was more than 6 and the total dose required in the first 12hours of postoperative period was also noted.

Results: There was no statistically significant difference in duration of analgesia, or hemodynamic parameters between the groups. However patients from control group required more doses of intraoperative sedation (χ^2 test, P=0.009) and more analgesics in the postoperative period, (χ^2 test, P=0.041) than the study group.

Conclusions: Adding dexmedetomidine to 0.25% bupivacaine in supraclavicular brachial plexus block provides better analgesia with lesser need of rescue analgesics and effective intraoperative sedation in children.

NYSORA-O-2
The Effect of Addition of Ketamine to 0.5% Hyperbaric Bupivacine in Spinal Subarachnoid Block: A Prospective, Randomized and Double Blind Study

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Introduction: The role of spinal anesthesia is being subjected to increasing scrutiny nowadays. The addition of ketamine enables the successful use of a lower dose of local anesthetic. The synergism between ketamine and local anesthetics make it possible to achieve a reliable spinal anesthesia with minimal hemodynamic changes using a low dose of local anesthetic.

Objectives: The effects of addition of 0.1 mg/kg of preservative free ketamine to 3 mL of 0.5% hyperbaric bupivacaine on the onset,duration and quality of spinal subarchnoid block was assessed.The hemodynamics and postoperative analgesia were also assessed.

Methods: After obtaining Institute Ethical Committee's approval 60 patients who were scheduled to undergo lower abdominal surgical procedures were randomly divided into two groups. Group I patients received spinal subarchnoid block (SAB) with 3 mL of 0.5% hyperbaric bupivacaine. Group II patients received SAB with 3 mL of 0.5% hyperbaric bupivacaine and ketamine (0.1mg/

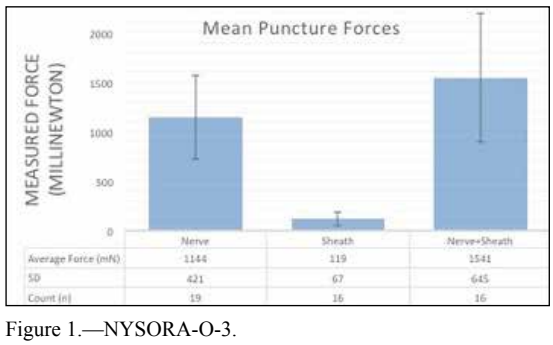

Figure 1.—NYSORA-O-3.

kg). SAB was performed in the lateral position , drugs were administered and later positioned supine after the injection.

Results: All the patients in both the groups had satisfactory central neuraxial blockade. We found early onset of sensory blockade in group II (5.17±0.98 minutes in Group I and 3.40±1.00 minutes in Group II, P<0.001), long duration of postoperative analgesia in group II (127.83±12.84 minutes in group I and 150.67±11.65 minutes in group II, P< 0.001) and less hemodynamic changes in Group II patients. Motor blockade and other recovery parameters were comparable among both the groups. There were no mojor side effects in both the groups.

Conclusions: Our study revealed that, with the addition of ketamine (0.1 mg/kg) to 3 mL of 0.5% hyperbaric bupivacaine, we are able to achieve good operating conditions, early onset and long duration of sensory block, almost equal duration of motor block, minimal hemodynamic changes and longer duration of postoperative analgesia.

NYSORA-O-3
The Physical Relationship of the Sciatic Nerve and Its Paraneural Sheath

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Introduction: The optimal location for local anesthetic injection during nerve blocks is within the paraneural sheath, but outside the epineurium of the nerve.

Objectives: The objectives of the study were to determine the relationship of puncture force between nerve tissue alone, nerve with overlying sheath, and paraneural sheath alone. A secondary objective was to determine the rate of intraneural injection with tangential vs. direct needle approach.

Methods: Seven sciatic nerves in non-preserved human cadavers, approved by University of Pittsburgh Committee for Oversight and Clinical Training Involving Decedents,were harvested after performing ultrasound guided subparaneural injections of 0.1 mL dilute black ink with either a tangential or direct approach at 18 sites. Prior to harvesting, nerves were grossly examined for intraneural dye. Needle-force evaluations were conducted on nerve segments including: nerve alone (IN); nerve with overlying sheath (NPS), paranaural sheath alone (IPS) using a customized micro indentation system. Mean puncture force values were compared using ANOVA and pairwise analysis.

Results: Mean puncture force was significantly different for IN, IPS and NPS (P<0.001) with ANOVA analysis. Pairwise analysis revealed that the mean puncture force for IPS (mN, N.=16) was significantly lower (P<0.001) than forces for NPS (mN, N.=16) or IN (mN, N.=19). The difference was less significant (P=.045) between the forces required to penetrate the IN and the NPS (Figure 1). During the injections, 12 tangential and 6 perpendicular subparaneural injections were performed. None of the tangential injections resulted in dye deposition within the nerve, while the direct approach resulted in 4 (67%) intraneural injections.

Conclusions: The paraneural sheath offers significantly less resistance to puncture force than the sciatic nerve. However, it's challenging to differentiate puncture of the sheath from intraneural needle-tip placement when the needle is applied directly over the nerve, substantiating the fact that needle approach should be tangential when fascia overlies nerve.

NYSORA-O-4
The Effect of Adding Different Doses of Magnesium Sulphate to Levobupivacaine for Spinal Anesthesia

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Introduction: The study was done to compare the efficacy of adding two different doses of magnesium sulphate to intrathecal levobupivacaine

Objectives: To evaluate the effect of adding different doses of magnesium sulphate (50 mg, 100 mg) to hyperbaric levobupivacaine (0.5%) for the spinal anaesthesia on the block characteristics.

Methods: After obtaining clearance from the ethics committee ,ninety patients of ASA grade I and II of either sex aged between 18-55 years were randomly allocated into 3 Groups.

- Group L received 3.4 mL of hyperbaric levobupivacaine (0.5%);
- Group M 50 received 3.4 mL of hyperbaric levobupivacaine (0.5%) and 50 mg of magnesium sulphate;
- Group M 100 received 3.4 mL of hyperbaric levobupivacaine (0.5%) and 100 mg of magnesium sulphate Total volume of study drugs was made uniform upto 3.6 mL by adding normal saline as required.The block charesteristics were assessed.

Results: The mean time of onset of sensory block was 5.57±1.98 min, 5.82±1.99 min and 7.31±2.69 min in Group L, M 50 and M 100 respectively (P=0.007) indicating delayed onset in magnesium groups. The mean time of onset of motor block was 5.38±3.82 min, 4.71±1.61 min and 6.76±3.91 min in group L, M 50 and M 100 respectively (P=0.053).The mean duration of sensory block was 165.06±34.3 min, 207.5±34.35 min and 245.5±48.8 min in group L, M 50 and M 100 respectively (P<0.001). The mean duration of motor block was 155.00±28.97 min, 183.16±24.19 min and 219.50±38.37 min in Group L, M 50 and M 100 respectively (P< 0.001) indicating significantly prolonged duration of sensory and motor block when magnesium is added as additive to levobupivacaine when compared to levobupivacaine alone.

Conclusions: Addition of 50 mg of magnesium sulphate to 0.5% hyperbaric levobupivacaine will prolong the duration of sensory and motor blockade in comparison to 100 mg of magnesium sulphate with fewer adverse effects and hence recommend addition of magnesium 50 mg.

NYSORA-O-5
Effects of Adding Dexmedetomidine to Lidocaine on the Onset and Duration of Axillary Block for Upper Extremity Surgeries

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Introduction: Regional nerve block is one of important and effective ways for analgesia and anesthesia during surgery and post-operative pain control which while providing optimum conditions for surgery and faster mobility after surgery, has lower risks related to general anesthesia and adverse effects and also reduces hospital costs. Axillary block is performed almost for hand and forearm anesthesia. Dexmedetomidine which is an alpha2 agonist decreases secretion of norepinephrine at pre-synaptic peripheral receptors and so reduces the transmission of pain signals and has independent inhibitory effect on nerve action potential.

Objectives: Purpose of this study was to examine the effects of adding dexmedetomidine to lidocaine in axillary block to improve quality of axillary block.

Methods: This study was performed as a randomized, double-blind clinical trial on 40 patients scheduled for hand and forearm surgery with axillary block. patients were divided randomly into two groups of 20: In the first group 39 cc of lidocaine 1% plus 1cc of normal saline were administered and the 2nd group received dexmedetomidine 1 cc (100 µg) in addition of 39 cc of lidocaine 1%. The onset and persistence of sensorimotor block and hemodynamic changes including heart rate, systolic and diastolic blood pressure before, during and after surgery were compared. Sensory block was assessed with pinprick test and motor block of radial, ulnar, median, and musculocutaneus nerve were evaluated with thumb abduction, thumb adduction, thumb opposition and elbow flexion separately.

Results: Onset of sensory and motor block was similar in both groups, but the persistence of sensory and motor block and analgesia in the dexmedetomidine group were significantly longer than the other group ($P<0.05$).

Conclusions: The results of this study showed that adding dexmedetomidine to lidocaine in axillary block did not alter the onset of sensory and motor block, but sensory and motor block length and analgesia increases. Despite differences in hemodynamic responses between the two groups, these changes were not clinically important.

NYSORA-P-1
Pediatric Pain Management Resources in New York State Among Children's and Mixed-Practice Hospitals in Lower and Higher Socioeconomic Areas

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Introduction: Do major differences exist in pediatric pain management resources between children's hospitals and mixed practice(adult and children) hospitals within lower and higher socioeconomic areas in New York?

Objectives: To determine whether hospitals offer a pediatric pain service (PPS) To evaluate the types of PPS offered To examine whether socioeconomic area and practice-based focus impacts likelihood of having PPS.

Methods: The study was approved by the IRB. A questionnaire was sent to anesthesia directors in NY hospitals via SurveyMonkey. The investigators looked up the names and email addresses of subjects at each hospital. Poverty-enriched areas were identified based on the Census Bureau definition of poverty-enriched areas. The χ^2 test or fisher's exact test was used. Analyses were conducted to compare hospitals with and without a PPS on several hospital characteristics. Statistical significance was defined at 0.06 alpha. All analyses were in SAS Version 9.4.

Results: Of 160 physicians contacted, 40 completed the survey. 25% reported that their hospital had pediatric pain services, and 40% reported that their hospital was an academic center. 53% classified their hospital as urban, 40% as suburban, and 8% as rural. In hospitals with a PPS, 60% were separate from the adult pain services, 90% have 24-hour pager call, 80% offer PCA, and 90% performed neuraxial buy 30% did not offer more specialized blocks. Nearly all centers doing blocks use ultrasound. Socioeconomic status of the area in which the hospital is situated did not impact the likelihood of having a PPS. PPS were significantly more likely to be present in academic centers ($P=0.06$), and dedicated children's hospitals were more likely to have a dedicated PPS ($P=0.01$). Rural hospitals were least likely to have PPS.

Conclusions: A minority of hospitals have a PPS. Of those that do, they were associated with being an academic center, and children's hospital. Being rural was least associated with having a pediatric pain service. Socioeconomic status actually did not have a statistically significant impact on likelihood of having a PPS, this refuted our primary hypothesis. These results indicate to us that targeting rural areas and community hospitals for enhancement of PPS would be valuable.

NYSORA-P-2
Factors Associated With Brachial Plexus Regional Anesthesia Failure For Upper Limb Surgery

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Introduction: Brachial plexus blockade as an anesthetic technique for upper limb surgery has some advantages over general anesthesia such as better post-operative analgesia, diminishes the rates of postoperative nausea and vomiting, fewer, consumption of opioid analgesia and faster hospital discharge. It is widely used in our practice with high effectiveness and proper safety profile. However, there is no quantification regarding the failure rate of blockade and its failure determining factors.

Objectives: Identify and quantify the factors associated with brachial plexus failure for upper limb surgery

TABLE I NYSORA-P-2.—*General variables of study population.*

Variables	Total cases	%	Failures	%
Gender				
Female	79	39,1	5	6,3
Male	123	60,9	10	8,13
Guidance Tool				
Ultrasonography	127	62,9	9	7,08
Neuroestimulator	71	35,14	6	8,4
Dual technique	4	1,98	0	0

TABLE II NYSORA-P-2.—*Risk estimation, Gender * General anesthesia post-blockade.*

		95% Confidence interval	
		Inferior	Superior
Odds ratio for gender (F/M)	1,31	0,43	3,985
Cohort general anesthesia postblockade = absent	1,02	0,943	1,102
Cohort general anesthesia postblockade = present	0,778	0,276	2,193
Total of valid cases	202		

as an initial observation in order to create risk profiles and strategies to prevent it.

Methods: After obtaining ethic committee approval (San Ignacio University Hospital, Bogotá, Colombia) an observational cross-sectional study was conducted by collecting data from electronic medical records of upper limb surgery with brachial plexus blockade from the San Ignacio University Hospital of the years 2011-2012, the blockade failures were identified using standardized clinical criteria, measuring potentially associated factors. Dichotomous comparisons were made and uni-and multivariate logistic regression analysis was performed to identify possible variables with statistical significance.

Results: None of the proposed factors was independently associated with failure of brachial plexus blockade. Qualitative description of failed cases presented confounding factors associated with local practices and no clinically plausible trend in failures characteristics.

Conclusions: None of the patient, anesthetic or surgical procedure, or operator factors were independently associate with the brachial plexus blockade failure. It is proposed to refine the definition of failure, not only in the research context, but in current clinical practice, improve recording systems in anesthesia to expand the quality of the databases that allow the quantitative approach to the failure risk of peripheral regional anesthesia and raise prevention strategies focused on risk groups.

NYSORA-P-3
Adverse Outcomes Associated With Peripheral Nerve Blocks

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Introduction: Ultrasound (US) guidance for peripheral nerve blocks (PNB) enables direct visualization of needle in relation to surrounding structures, which may favorably impact complications. Previously, we have reported on a significant decline in local anesthetic systemic toxicity (LAST) with gradual transition to US-guided regional anesthesia techniques (UGRA) at our own institution.

Objectives: We present an updated analysis of PNB complications in our practice over the last 4 years. Our hypothesis is that with virtually complete transition to UGRA, the incidence of adverse outcomes remains significantly lower.

Methods: This study was designated as exempt. A 48-month period from January 1, 2012 was analyzed. Patient's billing data and QI database were reviewed to obtain a total number of PNBs, block sites and techniques as well as reported adverse events. The incidence of complications was compared between each technique for the current period and then combined and with our historical data. Confidence intervals were estimated using binomial (Clopper-Pearson) 'exact' method. Statistical analysis was performed using χ^2 test with Yates correction.

Results: A total of 8229 PNBs were performed over the query period with 94% utilizing UGRA; by the end of the period US guidance was used for all blocks. Five complications during this period were reported. There were three incidences of sensory deficits following femoral and interscalene US-guided blocks. Only one case of LAST was noted that presented as seizure in a setting of landmark-based interscalene block. In addition, there was one case of a mild local infection at the site of femoral nerve catheter. Statistical analysis did not demonstrate significant difference in the incidence of nerve injury or LAST for the querry period. However, when combined with data from our previous reports, the difference in incidence of LAST reached statistical significance (Table I NYSORA-P-3).

Conclusions: UGRA has become the predominant modality for PNBs performed at our institution. While infrequent neurologic complaints continue to occur, the rate of LAST has significantly decreased with introduction of ultrasound guidance.

TABLE I NYSORA-P-3.—*Comparison of utilization of PNB techniques and associated rates of complications.*

	Current query: 2011-2015			Historical data: 2006-2011			Combined: 2006-2015		
	N.	Nerve Injury, N. (95%CI /1000)	LAST, N. (95%CI /1000)	N.	Nerve Injury, N.	LAST, N.	N.	Nerve Injury, N. (95%CI /1000)	LAST, N. (95%CI /1000)
US- guided blocks	7725	3 0-1/1000	0 0-7/1000	9069	1	0	16794	4 0-0.2/1000	0 0-0.2/1000
Non-US-guided blocks	504	0 0-0.5/1000	1 0.1-11/1000	5436	4	6	5940	4 0.2-1.7/1000	7 0.5-2/1000
P value		0.66	0.067		NA			0.25	0.0001

NYSORA-P-4
A 'Smart' Needle for Objective Nerve Localization During Ultrasound Guided Peripheral Nerve Block

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Introduction: Ultrasound guidance has become the gold standard nerve localization technique in modern peripheral nerve block (PNB). Limitations in ultrasonography fail to define the relationship between nerve and needle tip prior to injection. The ASRA neurologic complications practice advisory states: "No nerve localization or monitoring technique has been shown to be clearly superior in terms of reducing the frequency of clinical injury"[1, 2].

Objectives: The purpose of this paper is to highlight a new technology; the 'smart' needle that will aid in the identification of needle tip location during ultrasound guided peripheral nerve block (USGPNB).

Methods: The 'smart' needle is fabricated by integrating a novel bioimpedance sensor to a commercially available needle. All tissue types have characteristic bioimpedance profiles. This allows the 'smart' needle to provide real-time identification of tissue type encountered at the needle tip. Importantly, the information generated will inform about needle-nerve proximity. By objectively defining needle tip location in real-time the operator of the 'smart' needle can identify optimum location for local anesthetic delivery. The integration of our bioimpedance sensor to a currently used needle does not alter the USGPNB procedure.

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Results: Results on characterization of the 'smart' needle by in vitro testing in saline solutions, phantom gels and meat will be presented. There are clear real-time bioimpedametric differences between different materials tested.

Conclusions: Bioimpedance can be used to identify tissue type at the needle tip. The addition of 'smart' needle technology to USGPNB may provide objective information of real-time needle-nerve proximity, and enhance procedural safety and efficacy.

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NYSORA-P-5
Stellate Ganglion Blocks for Refractory Ventricular Tachycardia, Case Series and Review

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Introduction: Refractory ventricular tachycardia/fibrillation (VT/VF) is caused or aggravated by sympathetic stimulation, which is mediated through stellate ganglion. Multiple case reports showed left stellate ganglion block (LSGB) could abort or alleviate ventricular

TABLE I NYSORA-P-5.

Case	Age/sex	Medical conditions	Reason to consult	Treatment before STG block
1	74/M	NICM (EF 35%), SSS, AS s/p AVR, VT s/p multiple ablation	VT storm, s/p 3 VT ablation with recently failed, epicardial scar from surgery	DCCV, lidocaine ggt, carvedilol, sotalol
2	40/M	Ischemic cardiomyopathy (EF 40-45%, VF cardiac arrest (EF 15% post arrest)	Recurrent VT storm after weaned off sedation and extubation, unstable hemodynamic	Defibrillation, norepinephrine, vasopressin, lidocaine ggt, amiodarone, intubated and sedated
3	57/F	End stage ARVD, biventricular failure (EF 35%), VT s/p AICD	Didn't attempt VT ablation due to multiple morphology, Multiple AICD shocks (VT), despite ATP (anti-tachycardia pacing)	DCCV, amiodarone ggt
4	42/M	NICM (EF less than 20%) s/p heartmate-II LVAD, recurrent VT s/p AICD, multiple ablation	Multiple AICD shocks (VT), sustain slow VT, failed 2 ablations in the past	DCCV, lidocaine ggt, quinidine, mexiletine, metoprolol, ranolazine
5	30/F	Prolong QT syndrome (LQT-7) s/p AICD	Two episode of VT/VF despite medication adjusted, failed VT ablation (no inducible VT after sedation)	nadolol, flecanide

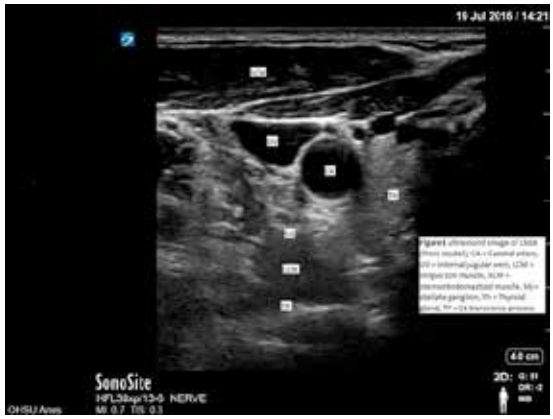

Figure 1 NYSORA-P-5.

arrhythmia. We present a case series, showing the effects of LSGB in patients who suffered from ventricular arrhythmia and are intractable to medication and cardiac intervention.

Case Description: Five patients, who suffered from intractable VT/VF (Table I NYSORA-P-5) were consulted for LSGB. All LSGB were done under ultrasound guidance, at bedside. The sonographic scanning was to identify anterior tubercle of C6 (Chassaignac's tubercle) and surrounding neurovascular structure. The needle was advanced with an in-plane guidance technique and aimed to deposit the local anesthetics (Table II NYSORA-P-5) medial to the Chassaignac's tubercle, anterior to prevertebral fascia of longus colli muscle. (Figure 1 NYSORA-P-5).

Four patients had significant decreases in ventricular arrhythmia burden. Among these patients, LSGB suppressed significant VT/VF for 3-7 days and at least 6 weeks in patient no4, who had repeated blocks. There was no significant hemodynamic change, but reports of transient Horner's syndrome, left-hand numbness, and hoarseness. The follow-up result is shown in Table II.

However, there was no change in frequency of PVC in patient no5, who recently received amiodarone and didn't experience VT for 4 days before LSGB.

Conclusions: Our case series showed that LSGB is an effective treatment and can be a lifesaving intervention for intractable VT/VF. The blocks provided not only temporary suppression of ventricular arrhythmia, but can also serve as a bridge to definitive treatment.

NYSORA-P-6
Gabapentin Decreases Post-Operative Pain Following Cesarean Section: A Meta-Analysis of Randomized Controlled Trials

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Introduction: Gabapentin has been effective at treating pain after knee and hip operations, and many other types of operations. The use of gabapentin for post-operative pain following cesarean section has remained controversial.

Objectives: The objective of this study is to compare the efficacy of a peri-operative oral dose of gabapentin, versus placebo in women undergoing Cesarean section.

Methods: The Pubmed, EMBASE, Scopus and ClinicalTrials.gov databases were searched on June 2016 for randomized controlled trials (RCT's) that evaluated the use of gabapentin in the perioperative period of women undergoing cesarean section. The primary outcome was pain score by visual analogue scale (VAS) on movement

TABLE II NYSORA-P-5.

Block	Medications	Complications	Results	Follow-up
1	0.5% ropivacaine, 7 mL	none	VT free for 3 days, underwent left thoracic sympathectomy on day4	D/C, readmitted 17 days later due to frequent VT (13 episodes since the surgery). Underwent right thoracic sympathectomy 3 days later. Still has 1-2 of VT on the last follow up.
2	0.2% ropivacaine, 10 mL	none	VT free for 4 days, underwent VT ablation on day5	D/C, no VT at 8 weeks follow up
3	0.5% ropivacaine, 10 mL	none	VT free for 7 days, underwent heart transplantation on day 7	D/C, no VT at 3 weeks post-transplant follow up
4-1	0.2% ropivacaine, 9 mL + dexa 10 mg	Transient Horner's syndrome	VT free for 2 days, asymptomatic NSVT on day 3 and underwent repeated block on day4	D/C, readmitted 2 months later due to LVAD thrombosis underwent LVAD exchanged. Occasional VT, controlled with medication (5 months).
4-2	0.5% ropivacaine, 10 mL	Transient Horner's syndrome and left hand numbness	Asymptomatic NSVT on day1, 4,6. No sustained VT until D/C (6 weeks later)	
5	0.5% bupivacaine, 12 mL	Transient Horner's syndrome and hoarseness	No change in PVC (possible due to no sustained VT for 4 days before the procedure and/ or amiodarone was recently started)	D/C, no VT in the last 6 months on 3 year follow up

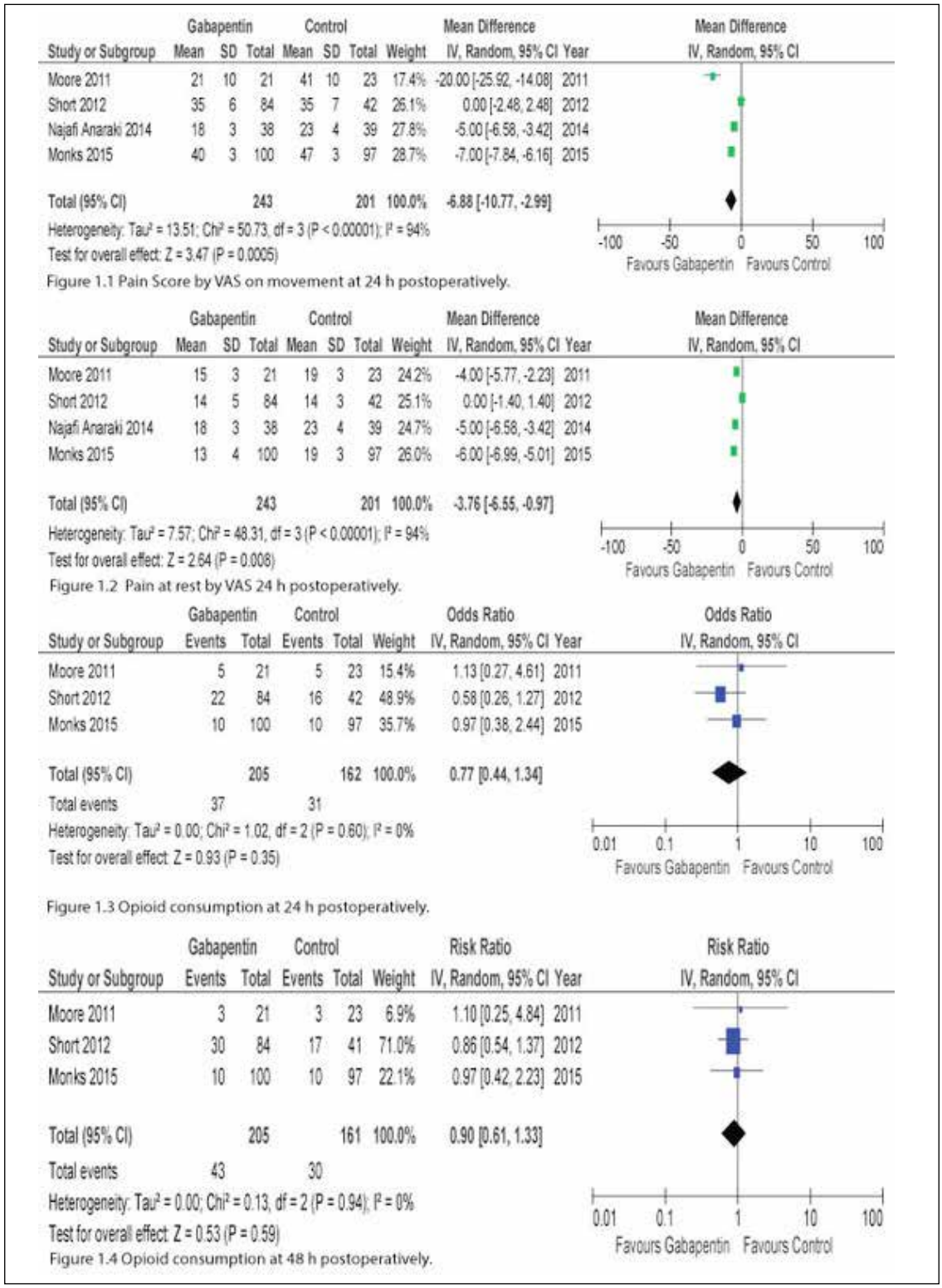

Figure 1 NYSORA-P-6.

TABLE II NYSORA-P-5.

		Moore (2011)	Short (2012)	Najafi A (2014)	Monks (2015)
Gabapentin dose (mg)		600	300 or 600	300	600 + 200 q8h
Control Group Drug		Placebo	Placebo	Fentanyl	Placebo
Number of Patients (Gabapentin/Control)		21/23	84/42	38/39	100/97
Mean age (y)	Gabapentin	35	34.9	27	35.9
	Control	34	35.3	28	34.7
Mean BMI (kg/m^2)	Gabapentin	29	30.3	29	30.8
	Control	30	29.3	28	31.3
Mean Gestation age (weeks)	Gabapentin	38.8	38.6	37.3	38.7
	Control	38.9	38.5	37.5	38.6

TABLE III NYSORA-P-5.—*Side Effects and Neonatal Outcomes.*

	Gabapentin		Control		P value
Side Effects at 24 h.	Events	Total	Events	Total	
Sedation	166	243	118	201	0.12
Vomiting	54	243	46	200	0.68
Pruritus	84	243	89	200	0.15
Neonatal Outcomes					
Birth Weight, mean (g)	3,465	205	3,372	162	0.15
Apgar Score, mean (1 min)	9.25	243	9.25	201	1.00
Apgar Score, mean (5 min)	9.25	243	9.25	201	1.00
NICU Admission	5	205	6	162	0.50

at 24 hours postoperatively. The secondary end-points included: pain at rest by VAS at 24 h, opioid consumption at 24 & 48 h, sedation, vomiting, and pruritus, and neonatal weight, Apgar scores, and need for Neonatal Intensive Care Unit (NICU) admission.

Results: Four RCTs (N.=444) fulfilled the inclusion criteria. Baseline characateristics are reflected in table 1. The patients receiving gabapentin had a reduction in VAS pain score at 24 h on movement (mean difference -6.8mm [95% confidence interals, -10.7 to -2.99, p-value 0.0005] and at rest (MD -3.7 mm [95% CI -6.5 to -0.9, p-value 0.0008] (Figure 1 NYSORA-P-6). There was no statistically significant different in the opioid comsumption at 24 h (RR 0.77, 95% CI 0.4-1.3) or 48 h (RR 0.9, 95% CI 0.6-1.3) postoperatively. There was no difference in sedation, vomiting, pruritus, birth weight, neonatal Apgar scores or NICU admission (Table II NYSORA-P-6).

Conclusions: Gabapentin reduces postcesarean delivery pain without increasing the rate of side effects or worsening neonatal outcomes.

NYSORA-P-7
A Novel Use of Epidural Continuous Infusion in Outpatient Setting

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Introduction: Epidural local anesthetic (LA) use has been reported in the inpatient setting for treatment of CRPS [1], but outpatient options are limited. Elastomeric pumps are commonly used for peripheral nerve blocks, postoperative pain, and palliative care in outpatient settings [2], but not described with epidural infusions. We describe a case of cervical epidural catheter placed under fluoroscopy utilizing an elastomeric pump in the outpatient setting. The system consists of a 270 mL elastomeric pump which is filled with 0.05% bupivicaine, delivering a constant 10mLs/h and has a clamp that can be used by the patient to start and stop the infusion.

Case Description: A 23 y/o man presented with CRPS type 1of the right hand/thumb for approximately 2 months duration after a work related injury, resulting in an incomplete fracture of the proximal phalanx and injury to the extensor tendons of his thumb which were repaired by orthopedics and a thumb spica splint was placed. Previous treatments consisted of physical therapy and PRN oxycodone-acetaminophen. A 3-week trial of pregabalin was tried without improvement. After discussing alternative treatments (stellate ganglion block), the patient elected to try a LA infusion through a cervical epidural catheter. The epidural space was accessed at the C7-T1 level via left paramedian approach under fluoroscopy, the catheter was threaded 5cm, and a 0.05% bupivacaine infusion was started via an elastomeric pump. On post-procedural day 4 the bupivacaine concentration was increased to 0.1% due to insufficient pain relief. He had good pain relief on day 8, and stopped the infusion on day 16. The catheter was removed on day 18.

Conclusions: We report a case of successful treatment of CRPS with an outpatient cervical epidural infusion. This modality has been used successfully for years at Geisinger Medical Center. Our goal is to bring attention to the outpatient use of elastomeric pumps for epidural

infusion in the treatment of CRPS. The successful resolution of debilitating symptoms in this patient is encouraging and the use of elastomeric pumps should be considered for further investigation into its efficacy in patients with CRPS. Permission for communicating has been obtained by the patient.

NYSORA-P-8
A Novel Nasal PAP Mask Assembly Maintained Spontaneous Ventilation and Oxygenation in a Patient with Autonomic Neuropathy under Interscalene Block and N_2O for Arthroscopic I&D of an Infected Shoulder Joint

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Figure 1 NYSORA-P-8.

Introduction: Patients under regional block routinely receive IV sedation and O_2 via Salter cannula. Oversedation and/or airway obstruction may cause severe desaturation. A simple nasal PAP mask assembly has been shown to maintain spontaneous ventilation and improve oxygenation in sedated obese patients with OSA.[1-3] We used this technique to provide nasal CPAP for a sedated patient in the sitting position with autonomic neuropathy under interscalene block during I&D of an infected shoulder.

Case Description: A 68 year old female with autonomic neuropathy associated with severe hypertension lability after a major disabling diarrheal illness presents with infected right shoulder after two failed rotator cuff repairs. Patient had failed attempts at both medical antihypertensive treatment, due to profound hypotension, and two medullary decompressive surgeries in an effort to relieve her dysautonomia. Pre-operatively she was found to have a blood pressure of 226/131 and heart rate of 134. Regional anesthesia via right interscalene one-shot block of 30cc of 2% Lidocaine with Epinephrine 1:200,000, supplemented by sedation, was implemented for arthroscopy and biopsy of her right shoulder to avoid extreme swings of blood pressure. To maintain adequate sedation and avoid airway obstruction in the sitting position, an infant mask was secured over her nose with head straps and connected by a long breathing circuit to the anesthesia machine. The APL valve was adjusted to deliver 6 cm H_2O CPAP with 2 L O_2/min and 2 L N_2O/min. She maintained spontaneous ventilation, oxygenation (100% O_2 saturation) and stable hemodynamics throughout. Patient tolerated the procedure well and was discharged without complication.

Conclusions: This nasal PAP mask/circuit assembly maintained spontaneous respiration, oxygenation and stable hemodynamics in a patient with autonomic neuropathy in the sitting position under interscalene block and sedation. This technique may non-invasively improve patient safety at low additional cost.