




Brendan Carvalho

Professor of Anesthesiology, Perioperative and Pain Medicine (Adult MSD)

 NIH Biosketch available Online

 Curriculum Vitae available Online

CLINICAL OFFICES

- **Dept of Anesthesia**

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Bio

BIO

Dr. Carvalho is the Chief of Obstetric Anesthesia and Professor in the Department of Anesthesiology, Stanford University Medical Center, and the President of the Society of Obstetric Anesthesia and Perinatology (SOAP). He has published extensively in the field of Obstetric Anesthesia with over 200 peer-reviewed articles, editorials, reviews, book chapters, and commentaries. He has received several NIH, pharmaceutical and institutional grants, and won numerous research awards including three Best Research Papers at SOAP scientific meetings. Dr. Carvalho has won the Teacher of the Year award at SOAP and at Stanford University's Departments of Anesthesia. He has presented at over 150 regional, national, and international meetings and visiting professorships. His scholarly activities are focused on clinical and translational research in the field of cesarean and labor analgesia, perinatal pharmacology and immunology.

CLINICAL FOCUS

- Anesthesia
- Anesthesia, Obstetrical
- Anesthesia, Regional

ACADEMIC APPOINTMENTS

- Professor - University Medical Line, Anesthesiology, Perioperative and Pain Medicine
- Member, Maternal & Child Health Research Institute (MCHRI)

ADMINISTRATIVE APPOINTMENTS

- Chief, Division of Obstetric Anesthesia, (2013- present)

PROFESSIONAL EDUCATION

- Board Certification: Anesthesia, American Board of Anesthesiology (2014)
- Fellowship, Stanford University , Obstetric Anesthesia (2002)
- Residency: Southwest School of Anesthesia (2001) England
- Internship: Groote Schuur Hospital (1995) South Africa

- Medical Education: University of Witwatersrand (1994) South Africa

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

I have completed research in a number of important areas in obstetric anesthesia including: optimizing neuraxial techniques for labor and cesarean analgesia; predicting individual labor and cesarean pain and analgesic needs; evaluating pregnancy-induced and hormonal changes in pain perception; determining the role of cytokines and other biochemical mediators in incisional wounds; evaluating local anesthetic potency and anesthetic requirements during labor and cesarean delivery; determining epidural and spinal opioid applications and the role of long-acting neuraxial opioids in obstetric pain management; investigating peripartum hemostatic and coagulation changes; conducting cost-analyses of various obstetric anesthesia practices; optimizing the management of maternal cardiac arrest and other obstetrical emergencies; determining patient attitudes and ethnic preferences towards obstetric analgesia; determining the efficacy of peripheral wound drug administration; and pharmacokinetics/pharmacodynamics of drugs administered to pregnant women. My current area of research focus is in developing novel ways of improving post-cesarean and peripartum labor pain management, and developing detailed pharmacokinetics/pharmacodynamics models of key antenatal medications.

CLINICAL TRIALS

- PIEB vs CEI for Labor Analgesia: An MLAC Study, Recruiting
- Virtual Reality Compared to Nitrous Oxide for Labor Analgesia, Recruiting
- Calcium Chloride for Prevention of Uterine Atony During Cesarean, Not Recruiting
- Pharmacokinetic (PK) and Pharmacodynamic (PD) Modeling of Ampicillin and Gentamicin in Peripartum Patients, Not Recruiting

Publications

PUBLICATIONS

- **Obstetric services in the UK during the COVID-19 pandemic: A national survey.** *Anaesthesia, critical care & pain medicine*
O'Carroll, J. E., Zucco, L., Warwick, E., Arbane, G., Moonesinghe, R., El-Boghdady, K., Guo, N., Carvalho, B., Sultan, P.
2022; 101137
- **Obstetric Anesthesia Procedure-Based Workload and Facility Utilization of Society of Obstetric Anesthesia and Perinatology Centers of Excellence Designated Institutions.** *Anesthesia and analgesia*
Im, M., Riley, E. T., Hoang, D., Lim, G., Zakowski, M., Carvalho, B.
2022
- **Assessment of Patient-Reported Outcome Measures for Maternal Postpartum Depression Using the Consensus-Based Standards for the Selection of Health Measurement Instruments Guideline: A Systematic Review.** *JAMA network open*
Sultan, P., Ando, K., Elkhateb, R., George, R. B., Lim, G., Carvalho, B., Chitneni, A., Kawai, R., Tulipan, T., Blake, L., Coker, J., O'Carroll, J.
2022; 5 (6): e2214885
- **Virtual Compared to In-Person Obstetric Anesthesiology Trainee Education During the COVID-19 Pandemic: A Short Report.** *Cureus*
Fedoruk, K., Abir, G., Carvalho, B.
2022; 14 (6): e26423
- **Storage of emergency airway equipment on labor and delivery units.** *Journal of clinical anesthesia*
Riley, E. T., Carvalho, B., Abir, G.
2022; 80: 110886
- **Expert Consensus Regarding Core Outcomes for Enhanced Recovery after Cesarean Delivery Studies: A Delphi study.** *Anesthesiology*
Sultan, P., George, R., Weiniger, C. F., El-Boghdady, K., Pandal, P., Carvalho, B., CRADLE Study Investigators, Ansari, J. R., Benhamou, D., Baluku, M., Bernstein, P. S., Bollag, L. A., Bowden, S. J., et al
2022
- **Enhancing recovery after cesarean delivery - A narrative review.** *Best practice & research. Clinical anaesthesiology*
O'Carroll, J., Carvalho, B., Sultan, P.

2022; 36 (1): 89-105

- **Comparing Postpartum Estimated and Quantified Blood Loss Among Racial Groups: An Observational Study.** *Cureus*
Katz, D., Khadge, S., Carvalho, B.
2022; 14 (5): e25299
- **Development and validation of a Portuguese version of Obstetric Quality of Recovery-10 (ObsQoR-10-Portuguese).** *Anaesthesia, critical care & pain medicine*
Mathias, L., Carlos, R. V., Siaulys, M., Gabriades, P., Guo, N., Domingue, B., O'Carroll, J., Carvalho, B., Sultan, P.
2022: 101085
- **Calcium chloride for the prevention of uterine atony during cesarean delivery: A pilot randomized controlled trial and pharmacokinetic study.** *Journal of clinical anaesthesia*
Ansari, J. R., Kalariya, N., Carvalho, B., Flood, P., Guo, N., Riley, E.
2022; 80: 110796
- **Cardiac ultrasonography in obstetrics - a necessary skill for the present and future anesthesiologist.** *International journal of obstetric anaesthesia*
Ortner, C. M., Padilla, C., Carvalho, B.
2022; 50: 103545
- **Accuracy of visual estimation of blood loss in obstetrics using clinical reconstructions: an observational simulation cohort study.** *International journal of obstetric anaesthesia*
Athar, M. W., Abir, G., Seay, R. C., Guo, N., Butwick, A., Carvalho, B.
2022; 50: 103539
- **In-Hospital Opioid Consumption After the Previous Cesarean Delivery Weakly Predicts Opioid Consumption After Index Delivery: A Retrospective Cohort Study.** *Anesthesia and analgesia*
Komatsu, R., Nash, M., Mandalia, S., Dinges, E., Kamal, U., Singh, D., El-Omrani, H., Anwar, A., Delgado, C., Ziga, T. M., Carvalho, B.
2022
- **World Health Organization Recommendation for Using Uterine Balloon Tamponade to Treat Postpartum Hemorrhage.** *Obstetrics and gynecology*
Weeks, A. D., Akinola, O. I., Amorim, M., Carvalho, B., Deneux-Tharoux, C., Liabsuetrakul, T., Meremikwu, M., Miller, S., Nabhan, A., Nagai, M., Wahabi, H., Walker, D.
1800
- **Patient Preferences for Outcomes Associated With Labor Epidural Analgesia.** *Cureus*
Harding, A., George, R. B., Munro, A., Coolen, J., Snelgrove-Clarke, E., Carvalho, B.
2022; 14 (2): e22599
- **Un sondage sur les pratiques de peridurales pour le travail dans les programmes de fellowship en anesthésie obstétricale aux États-Unis.** *Canadian journal of anaesthesia = Journal canadien d'anesthésie*
Callahan, E., Yeh, P., Carvalho, B., George, R. B.
1800
- **Quantitative blood loss after vaginal delivery: a retrospective analysis of 104#079 measurements at 41 institutions.** *International journal of obstetric anaesthesia*
Ansari, J., Farber, M. K., Thurer, R. L., Guo, N., Rubenstein, A., Carvalho, B.
2022; 51: 103256
- **Limitations of Gravimetric Quantitative Blood Loss during Cesarean Delivery** *AJP REPORTS*
Thurer, R. L., Doctorvaladan, S., Carvalho, B., Jelks, A. T.
2022; 12 (01): E36-E40
- **A randomized trial to investigate needle redirections/re-insertions using a handheld ultrasound device versus traditional palpation for spinal anesthesia in obese women undergoing cesarean delivery.** *International journal of obstetric anaesthesia*
Weiniger, C. F., Carvalho, B., Ronel, I., Greenberger, C., Aptekman, B., Almog, O., Kagan, G., Shalev, S.
2021: 103229
- **Impact of enhanced recovery after caesarean delivery on maternal outcomes: A systematic review and meta-analysis.** *Anaesthesia, critical care & pain medicine*
Pervez, S., Sharawi, N., Blake, L., Habib, A. S., Brookfield, K. F., Carvalho, B.

2021: 100935

- **Evidence-based guidance for use of intrathecal morphine as an alternative to diamorphine for Caesarean delivery analgesia.** *British journal of anaesthesia*
Sultan, P., Carvalho, B.
2021
- **Estimating Obstetric Anaesthesia Workload: Number of Deliveries Compared to Time-Based Workload.** *Turkish journal of anaesthesiology and reanimation*
Kowalczyk, J. J., Lipman, S. S., Carvalho, B.
2021; 49 (4): 292-297
- **Estimating Obstetric Anaesthesia Workload: Number of Deliveries Compared to Time-Based Workload** *TURKISH JOURNAL OF ANAESTHESIOLOGY AND REANIMATION*
Kowalczyk, J. J., Lipman, S. S., Carvalho, B.
2021; 49 (4): 292-297
- **Standardizing nomenclature in regional anesthesia: an ASRA-ESRA Delphi consensus study of abdominal wall, paraspinal, and chest wall blocks.** *Regional anesthesia and pain medicine*
El-Boghdadly, K., Wolmarans, M., Stengel, A. D., Albrecht, E., Chin, K. J., Elsharkawy, H., Kopp, S., Mariano, E. R., Xu, J. L., Adhikary, S., Altiparmak, B., Barrington, M. J., Bloc, et al
2021; 46 (7): 571-580
- **Integrated trajectories of the maternal metabolome, proteome, and immunome predict labor onset.** *Science translational medicine*
Stelzer, I. A., Ghaemi, M. S., Han, X., Ando, K., Hedou, J. J., Feyaerts, D., Peterson, L. S., Rumer, K. K., Tsai, E. S., Ganio, E. A., Gaudilliere, D. K., Tsai, A. S., Choisy, et al
2021; 13 (592)
- **Intravenous oxytocin dosing regimens for postpartum hemorrhage prevention at cesarean section: a systematic review and meta-analysis.** *American journal of obstetrics and gynecology*
Phung, L. C., Farrington, E. K., Connolly, M., Wilson, A. N., Carvalho, B., Homer, C. S., Vogel, J. P.
2021
- **An observational pilot study of a novel loss of resistance syringe for locating the epidural space.** *International journal of obstetric anaesthesia*
Athar, M. W., Guo, N., Ortner, C., Carvalho, B., Abir, G., Riley, E. T.
2021: 102984
- **Superficial Cervical Plexus Block for Awake Large-Bore Central Line Placement in Parturients: A Case Series.** *A&A practice*
Sheikh, M., Carvalho, B., Boublik, J., Ansari, J.
2021; 15 (3): e01429
- **Point-of-Care Lung Ultrasound Pattern in Healthy Parturients: Prevalence of Pulmonary Interstitial Syndrome Following Vaginal Delivery, Elective and Unplanned Intrapartum Cesarean Delivery.** *Anesthesia and analgesia*
Macias, P. n., Wilson, J. G., Austin, N. S., Guo, N. n., Carvalho, B. n., Ortner, C. M.
2021
- **A systematic review of patient-reported outcome measures used to assess sleep in postpartum women using Consensus Based Standards for the Selection of Health Measurement Instruments (COSMIN) guidelines.** *Sleep*
Sultan, P. n., Ando, K. n., Sultan, E. n., Hawkins, J. n., Blake, L. n., Barwick, F. n., Kawai, M. n., Carvalho, B. n.
2021
- **Use of Patient-Reported Outcome Measures to Assess Outpatient Postpartum Recovery: A Systematic Review.** *JAMA network open*
Sultan, P., Sharawi, N., Blake, L., Ando, K., Sultan, E., Aghaeepour, N., Carvalho, B., Sadana, N.
2021; 4 (5): e2111600
- **A systematic review of patient-reported outcome measures used to assess postpartum pain using Consensus Based Standards for the Selection of Health Measurement Instruments (COSMIN) guidelines.** *British journal of anaesthesia*
Sultan, P. n., Ando, K. n., Sultan, E. n., Hawkins, J. E., Chitneni, A. n., Sharawi, N. n., Sadana, N. n., Blake, L. E., Singh, P. M., Flood, P. n., Carvalho, B. n.
2021
- **Acute Pain Burden and Opioid Dose Requirements after Cesarean Delivery in Parturients with Preexisting Chronic Back Pain and Migraine.** *Anesthesiology research and practice*
Komatsu, R., Nash, M. G., Ruth, K. C., Harbour, W., Ziga, T. M., Mandalia, S., Dinges, E. M., Singh, D., El-Omrani, H., Reno, J., Carvalho, B., Bollag, L. A.

2021; 2021: 3305579

- **A Peripheral Immune Signature of Labor Induction.** *Frontiers in immunology*
Ando, K., Hédou, J. J., Feyaerts, D., Han, X., Ganio, E. A., Tsai, E. S., Peterson, L. S., Verdonk, F., Tsai, A. S., Mari#, I., Wong, R. J., Angst, M. S., Aghaeepour, et al
2021; 12: 725989
- **The Generalizability of Patients' Preferences and Concerns regarding Anesthesia Care for Cesarean Delivery: A Prospective Survey.** *Anesthesiology research and practice*
Smith, A. J., Daly, J., Arnolds, D. E., Scavone, B. M., Carvalho, B.
1800; 2021: 9002061
- **Ampicillin Pharmacokinetics in Peripartum and Laboring Women.** *American journal of perinatology*
Judy, A. E., Frymoyer, A., Ansari, J., Drover, D. R., Carvalho, B.
2021
- **Proposed domains for assessing postpartum recovery: A concept elicitation study.** *BJOG : an international journal of obstetrics and gynaecology*
Sultan, P., Jensen, S. E., Taylor, J., El-Sayed, Y., Carmichael, S., Cella, D., Angst, M. S., Gaudilliere, B., Lyell, D. J., Carvalho, B.
2021
- **Pain after vaginal delivery and during breastfeeding: underexplored and underappreciated.** *International journal of obstetric anaesthesia*
Sultan, P. n., Carvalho, B. n.
2021; 46: 102969
- **Spinal prilocaine for caesarean section: walking a fine line.** *Anaesthesia*
Carvalho, B. n., Sultan, P. n.
2021
- **Regional anaesthesia for labour, operative vaginal delivery and caesarean delivery: a narrative review.** *Anaesthesia*
Sultan, P. n., Sultan, E. n., Carvalho, B. n.
2021; 76 Suppl 1: 136–47
- **Comment on the editorial relating to: Transversus abdominis plane block compared with wound infiltration for postoperative analgesia following Cesarean delivery: a systematic review and network meta-analysis.** *Canadian journal of anaesthesia = Journal canadien d'anesthésie*
Sultan, P. n., Carvalho, B. n., Halpern, S. n.
2021
- **Antibiotic Prophylaxis for Cesarean Delivery: A Survey of Anesthesiologists** *ANESTHESIOLOGY RESEARCH AND PRACTICE*
Reiff, E. S., Habib, A. S., Carvalho, B., Raghunathan, K.
2020; 2020
- **Antibiotic Prophylaxis for Cesarean Delivery: A Survey of Anesthesiologists.** *Anesthesiology research and practice*
Reiff, E. S., Habib, A. S., Carvalho, B., Raghunathan, K.
2020; 2020: 3741608
- **Confounders Not General Anesthesia Likely Explain Greater Postpartum Depression.** *Anesthesia and analgesia*
Ansari, J., Carvalho, B., Weiniger, C. F., Riley, E. T.
2020; 131 (6): e248–e250
- **Alternate Dosing Protocol for Magnesium Sulfate in Obese Women With Preeclampsia: A Randomized Controlled Trial.** *Obstetrics and gynecology*
Brookfield, K. F., Tuel, K., Rincon, M., Vinson, A., Caughey, A. B., Carvalho, B.
2020
- **Correction to: Transversus abdominis plane block compared with wound infiltration for postoperative analgesia following Cesarean delivery: a systematic review and network meta-analysis.** *Canadian journal of anaesthesia = Journal canadien d'anesthésie*
Sultan, P., Patel, S. D., Jadin, S., Carvalho, B., Halpern, S. H.
2020
- **Transversus Abdominis Plane Block With Liposomal Bupivacaine for Pain After Cesarean Delivery in a Multicenter, Randomized, Double-Blind, Controlled Trial.** *Anesthesia and analgesia*
Nedeljkovic, S. S., Kett, A., Vallejo, M. C., Horn, J., Carvalho, B., Bao, X., Cole, N. M., Renfro, L., Gadsden, J. C., Song, J., Yang, J., Habib, A. S.

2020

- **Reply to: Re: enhanced recovery for cesarean section: beyond pain control.** *International journal of obstetric anesthesia*
Kleiman, A. M., Chisholm, C. A., Carvalho, B., Tiouririne, M.
2020; 44: 52
- **Re: Association between opioid use after intrapartum cesarean delivery and repeat cesarean delivery: a retrospective cohort study.** *International journal of obstetric anesthesia*
Komatsu, R., Carvalho, B., Flood, P. D.
2020; 43: 30
- **Impact of enhanced recovery after cesarean delivery on maternal outcomes: A meta-analysis**
Taylor, J., Sultan, P., Sharawi, N., Habib, A. S., Carvalho, B., Blake, L.
LIPPINCOTT WILLIAMS & WILKINS.2020: 541
- **Enhanced recovery after surgery for cesarean delivery.** *Current opinion in obstetrics & gynecology*
Suharwardy, S., Carvalho, B.
2020
- **Conversion of labour epidural analgesia to surgical anaesthesia for emergency intrapartum Caesarean section** *BJA EDUCATION*
Desai, N., Carvalho, B.
2020; 20 (1): 26–31
- **Evaluation of Domains of Patient-Reported Outcome Measures for Recovery After Childbirth: A Scoping and Systematic Review.** *JAMA network open*
Sultan, P. n., Sadana, N. n., Sharawi, N. n., Blake, L. n., El-Boghdadly, K. n., Falvo, A. n., Ciechanowicz, S. n., Athar, W. n., Shah, R. n., Guo, N. n., Jensen, S. n., El-Sayed, Y. n., Cella, et al
2020; 3 (5): e205540
- **Pain management during labor and vaginal birth.** *Best practice & research. Clinical obstetrics & gynaecology*
Nanji, J. A., Carvalho, B. n.
2020
- **Hemodynamic profiles with and without left uterine displacement: A randomized study in term pregnancies receiving subarachnoid blockade for cesarean delivery.** *Journal of clinical anesthesia*
Chungsamarnyart, Y. n., Wacharasint, P. n., Carvalho, B. n.
2020; 64: 109796
- **Enhanced recovery after caesarean delivery versus standard care studies: a systematic review of interventions and outcomes.** *International journal of obstetric anesthesia*
Sultan, P. n., Sharawi, N. n., Blake, L. n., Carvalho, B. n.
2020
- **Alternate dosing for magnesium in obese preeclamptic women: a cost-effectiveness analysis**
Hersh, A. R., Harmon, D., Chaiken, S., Brookfield, K., Vinson, A., Carvalho, B., Caughey, A. B.
MOSBY-ELSEVIER.2020: S365
- **Do alternative magnesium sulfate protocols in obese preeclamptic women impact neonatal morbidity?**
Vinson, A., Rincon, M., Tuel, K., Carvalho, B., Caughey, A. B., Brookfield, K.
MOSBY-ELSEVIER.2020: S500
- **A randomized trial of an alternate dosing protocol of magnesium sulfate in obese preeclamptic women**
Brookfield, K., Rincon, M., Tuel, K., Vinson, A., Caughey, A. B., Carvalho, B.
MOSBY-ELSEVIER.2020: S19
- **Transversus abdominis plane block compared with wound infiltration for postoperative analgesia following Cesarean delivery: a systematic review and network meta-analysis.** *Canadian journal of anaesthesia = Journal canadien d'anesthesie*
Sultan, P. n., Patel, S. D., Jadin, S. n., Carvalho, B. n., Halpern, S. H.
2020
- **Evaluation of inpatient postpartum recovery using the Obstetric Quality of Recovery-10 patient-reported outcome measure: a single-center observational study.** *American journal of obstetrics & gynecology MFM*

- Sultan, P. n., Kamath, N. n., Carvalho, B. n., Bansal, P. n., Elkhateb, R. n., Dougan, S. n., Whittington, J. n., Guo, N. n., El-Sayed, Y. n., Mhyre, J. n., Sharawi, N. n. 2020; 2 (4): 100202
- **Society for Obstetric Anesthesia and Perinatology: Consensus Statement and Recommendations for Enhanced Recovery After Cesarean.** *Anesthesia and analgesia*
Bollag, L. n., Lim, G. n., Sultan, P. n., Habib, A. S., Landau, R. n., Zakowski, M. n., Tiouririne, M. n., Bhambhani, S. n., Carvalho, B. n. 2020
 - **Comparison of spontaneous versus operative vaginal delivery using Obstetric Quality of Recovery-10 (ObsQoR-10): An observational cohort study.** *Journal of clinical anesthesia*
Sultan, P. n., Kormendy, F. n., Nishimura, S. n., Carvalho, B. n., Guo, N. n., Papageorgiou, C. n. 2020; 63: 109781
 - **Postpartum recovery: what does it take to get back to a baseline?** *Current opinion in obstetrics & gynecology*
Sultan, P. n., Carvalho, B. n. 2020; Publish Ahead of Print
 - **Quadratus lumborum block vs. transversus abdominis plane block for caesarean delivery: a systematic review and network meta-analysis.** *Anaesthesia*
El-Boghdadly, K. n., Desai, N. n., Halpern, S. n., Blake, L. n., Odor, P. M., Bampoe, S. n., Carvalho, B. n., Sultan, P. n. 2020
 - **Obstetric Anaesthetists' Association/National Perinatal Epidemiology Unit collaborative project to develop key indicators for quality of care in obstetric anaesthesia: first steps in the right direction.** *Anaesthesia*
Carvalho, B., Kinsella, S. M. 2019
 - **Evaluation of Electronic Medical Records on Nurses' Time Allocation During Cesarean Delivery.** *Journal of patient safety*
Tan, M., Lipman, S., Lee, H., Sie, L., Carvalho, B. 2019; 15 (4): e82–e85
 - **Addressing Racial and Ethnic Disparities in Pain Management in the Midst of the Opioid Crisis.** *Obstetrics and gynecology*
Bateman, B. T., Carvalho, B. 2019; 134 (6): 1144-1146
 - **Electrical stimulation test for epidural catheter placement after receiving intrathecal local anesthetic during a combined spinal-epidural technique for Cesarean delivery: confirmation of the spinal nerve root as epidural site of action.** *Canadian journal of anaesthesia = Journal canadien d'anesthésie*
Stewart, M., Carvalho, B., Tsui, B. C. 2019
 - **Virtual reality successfully provides anxiolysis to laboring women undergoing epidural placement.** *Journal of clinical anesthesia*
Kist, M., Bekemeyer, Z., Ralls, L., Carvalho, B., Rodriguez, S. T., Caruso, T. J. 2019: 109635
 - **Ocular sonography in pre-eclampsia: a simple technique to detect raised intracranial pressure?** *International journal of obstetric anaesthesia*
Ortner, C. M., Macias, P., Neethling, E., Krishnamoorthy, V., Carvalho, B., Swanevelder, J. L., Dyer, R. A. 2019
 - **Prevention of hypotension after spinal anaesthesia for caesarean section: a systematic review and network meta-analysis of randomised controlled trials.** *Anaesthesia*
Fitzgerald, J. P., Fedoruk, K. A., Jadin, S. M., Carvalho, B., Halpern, S. H. 2019
 - **Evaluation of the impact of enhanced recovery after surgery protocol implementation on maternal outcomes following elective cesarean delivery.** *International journal of obstetric anaesthesia*
Kleiman, A. M., Chisholm, C. A., Dixon, A. J., Sariosek, B. M., Thiele, R. H., Hedrick, T. L., Carvalho, B., Tiouririne, M. 2019
 - **Evaluation of patient-reported outcome measures of functional recovery following caesarean section: a systematic review using the consensus-based standards for the selection of health measurement instruments (COSMIN) checklist.** *Anaesthesia*
Sharawi, N., Klima, L., Shah, R., Blake, L., Carvalho, B., Sultan, P. 2019

- **Society for Obstetric Anesthesia and Perinatology Consensus Statement: Monitoring Recommendations for Prevention and Detection of Respiratory Depression Associated With Administration of Neuraxial Morphine for Cesarean Delivery Analgesia** *ANESTHESIA AND ANALGESIA*
Bauchat, J. R., Weiniger, C. F., Sultan, P., Habib, A. S., Ando, K., Kowalczyk, J. J., Kato, R., George, R. B., Palmer, C. M., Carvalho, B.
2019; 129 (2): 458–74
- **The comparative accuracy of a handheld and console ultrasound device for neuraxial depth and landmark assessment** *INTERNATIONAL JOURNAL OF OBSTETRIC ANESTHESIA*
Carvalho, B., Seligman, K. M., Weiniger, C. F.
2019; 39: 68–73
- **Evaluation of the Obstetric Quality-of-Recovery score (ObsQoR-11) following non-elective caesarean delivery** *INTERNATIONAL JOURNAL OF OBSTETRIC ANESTHESIA*
Ciechanowicz, S., Howie, R., Heppolette, C., Nakhjavani, B., Carvalho, B., Sultan, P.
2019; 39: 51–59
- **Preoperative Fasting Times for Patients Undergoing Caesarean Delivery: Before and After a Patient Educational Initiative.** *Turkish journal of anaesthesiology and reanimation*
Yurashevich, M., Chow, A., Kowalczyk, J. J., Traynor, A. J., Carvalho, B.
2019; 47 (4): 282-286
- **Preoperative Fasting Times for Patients Undergoing Caesarean Delivery: Before and After a Patient Educational Initiative** *TURKISH JOURNAL OF ANAESTHESIOLOGY AND REANIMATION*
Yurashevich, M., Chow, A., Kowalczyk, J. J., Traynor, A. J., Carvalho, B.
2019; 47 (4): 282–86
- **International consensus statement on the use of uterotonic agents during caesarean section.** *Anaesthesia*
Heesen, M., Carvalho, B., Carvalho, J. C., Duvekot, J. J., Dyer, R. A., Lucas, D. N., McDonnell, N., Orbach-Zinger, S., Kinsella, S. M.
2019
- **Supraglottic Airway Rescue After Failed Fiberoptic Intubation in a Patient With Osteogenesis Imperfecta: A Case Report** *A & A PRACTICE*
Sutton, C., Carvalho, B.
2019; 13 (1): 7–9
- **Determinants of women's dissatisfaction with anaesthesia care in labour and delivery.** *Anaesthesia*
Yurashevich, M., Carvalho, B., Butwick, A. J., Ando, K., Flood, P. D.
2019
- **Pain relief during labour.** *Lancet (London, England)*
Lozada, M. J., Weiniger, C. F., Carvalho, B., Bauchat, J. R.
2019
- **Impact of intra-operative dexamethasone after scheduled cesarean delivery: a retrospective study.** *International journal of obstetric anaesthesia*
Nanji, J. A., Guo, N., Riley, E. T., Carvalho, B.
2019
- **Differential Dynamics of the Maternal Immune System in Healthy Pregnancy and Preeclampsia.** *Frontiers in immunology*
Han, X., Ghaemi, M. S., Ando, K., Peterson, L. S., Ganio, E. A., Tsai, A. S., Gaudilliere, D. K., Stelzer, I. A., Einhaus, J., Bertrand, B., Stanley, N., Culos, A., Tanada, et al
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