



## Albert Hyukjae Kwon, M.D.

Clinical Assistant Professor, Anesthesiology, Perioperative and Pain Medicine

### CLINICAL OFFICE (PRIMARY)

- **Pain Management Clinic**

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### Bio

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#### BIO

Dr. Kwon joined the Stanford Pain Medicine faculty in 2021. He is board-certified in Anesthesiology, Pain Medicine, and board-eligible in General Pediatrics. His clinical focus is in chronic pain care transition from adolescence to adulthood and chronic pain syndromes of young adults (below age 30). Collaborating with a multidisciplinary team and leveraging digital health solutions, he is building the Stanford Adolescent and Young Adult Pain Program to bridge the Pediatric Pain Management Program at Lucile Packard Children's Hospital Stanford and the Stanford Pain Management Center at Stanford Hospital and Clinics.

Dr. Kwon completed his B.S. degree in Biology at Massachusetts Institute of Technology, Cambridge, MA. As an undergraduate student, he pursued bone tissue engineering and stem cell research within the MIT Langer Lab and drug delivery research within the Laboratory for Biomaterials and Drug Delivery at Boston Children's Hospital. He then received his medical degree at Harvard Medical School and the Harvard-MIT Program in Health Sciences and Technology. As a medical student, he did research in neuroengineering and optogenetics in the MIT Media Lab. He completed a combined residency in Pediatrics and Anesthesiology at Boston Children's Hospital and Brigham and Women's Hospital and a fellowship in Pain Medicine at Stanford Hospital.

With his diverse research background in various engineering fields, he continues to collaborate with colleagues across academia and industry in medical device and technology development. During the first wave of COVID-19 pandemic and when a critical shortage of ICU ventilators was looming in the United States, he co-led the clinical team for the MIT Emergency Ventilator project (<https://emergency-vent.mit.edu/>), which published an open-source reference design for converting any manual resuscitator bag into a basic ventilator. This open-source reference design has given rise to multiple spin-off ventilator designs across the globe and continues to save countless patient lives in countries where limited critical care resources are available. Dr. Kwon is interested in building more resilient critical care healthcare systems leveraging technology that is actually designed to meet the infrastructural challenges in developing countries.

## CLINICAL FOCUS

- Pain Medicine

## ACADEMIC APPOINTMENTS

- Clinical Assistant Professor, Anesthesiology, Perioperative and Pain Medicine

## PROFESSIONAL EDUCATION

- Board Certification: Pain Medicine, American Board of Anesthesiology (2020)
- Chief Fellow, Stanford University School of Medicine , Pain Medicine (2019)
- Fellowship, Stanford University School of Medicine , Pain Medicine (2019)
- Board Certification: Anesthesia, American Board of Anesthesiology (2019)
- Residency, Brigham and Women's Hospital / Harvard Medical School , Anesthesiology (2018)
- Fellowship: Stanford School of Medicine (2019) CA
- Residency, Boston Children's Hospital / Harvard Medical School , Pediatrics (2018)
- Residency: Brigham and Women's Hospital Anesthesiology Residency (2018) MA
- Internship, Boston Children's Hospital , Pediatrics (2014)
- Residency: Boston Children's Hospital (2018) MA
- M.D., Harvard Medical School - MIT Division of Health Sciences and Technology , Medicine (2013)
- Medical Education: Harvard Medical School (2013) MA
- B.S., Massachusetts Institute of Technology , Biology (2008)

## PATENTS

- Edward S. Boyden, Brian Y. Chow, Xue Han, Xiaofeng Qian, Nathan Cao Klappoetke, Albert Hyukjae Kwon. "United States Patent 12714436 Light-Activated Proton Pumps and Applications Thereof", Massachusetts Institute of Technology

## Publications

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### PUBLICATIONS

- **Performance assessment of a ventilator developed for emergency use in a resource-constrained ICU setting during the COVID-19 pandemic.** *Biomedical engineering online*  
Sanchez-Gambetta, S., Arrunategui-Salas, G., Barrios-Morocho, J. L., Hora, R. A., Perez-Buitrago, S., Castaneda, B., Kwon, A. H., Nabzdyk, C. G., Casado, F. L.  
2025; 24 (1): 97
- **Transforming Pain Medicine: The Power of Collaboration, Entrepreneurship, and Innovation.** *Pain medicine (Malden, Mass.)*  
Hirani, S., Vu, P., Halac, M., Bohacek, S., Benkli, B., Jevotovsky, D., Vega, J., Hirani, A., Orhurhu, V., Odonkor, C., Ehrenfeld, J., Shadid, I., Azadian, et al  
2025
- **Where do we start? Health care transition in adolescents and young adults with chronic primary pain.** *Pain*  
Feinstein, A. B., Brown, K., Dunn, A. L., Neville, A. J., Sokol, O., Poupore-King, H., Sturgeon, J. A., Kwon, A. H., Griffin, A. T.  
2024
- **Blinded Pain Cocktails: A Reliable and Safe Opioid Weaning Method.** *Anesthesiology clinics*  
Kwon, A. H., Colloca, L., Mackey, S. C.  
2023; 41 (2): 371-381
- **Pediatric transition into adult care: Exploring perceptions and needs of adolescents with chronic pain**  
Sokol, O., Griffin, A., Brown, K., Dunn, A., Poupore-King, H., Kwon, A., Berger, A., Neville, A., Feinstein, A.  
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- **Beyond Transition Readiness: What Young Adults with Chronic Pain Want in Health Care Transition Support**  
Brown, K., Griffin, A., Sokol, O., Dunn, A., Poupore-King, H., Berger, A., Kwon, A., Feinstein, A.  
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- **Continuous Ketamine Infusion as a Treatment for Refractory Facial Pain** *CUREUS JOURNAL OF MEDICAL SCIENCE*  
Garcia, R., Chen, Q., Posadas, E., Tran, J., Kwon, A., Qian, X.  
2023; 15 (3)
- **Opioid-sparing technique with the use of thoracolumbar dorsal ramus nerve catheter after adolescent spinal deformity surgery.** *Journal of clinical anesthesia*  
Kim, J. H., Kwon, A. H., Spivak, A., Delbello, D., Xu, J. L.  
2021; 72: 110304
- **Cervical erector spinae plane block: is it feasible for cervical spine surgeries?** *Regional anesthesia and pain medicine*  
Kwon, A. H., Xu, J. L.  
2021; 46 (6): 552-553
- **MIT Emergency-Vent: An Automated Resuscitator Bag for the COVID-19 Crisis.** *Annual International Conference of the IEEE Engineering in Medicine and Biology Society. IEEE Engineering in Medicine and Biology Society. Annual International Conference*  
Ort, T., Hanumara, N., Antonini, A., Araki, B., Abu-Khalaf, M., Detienne, M., Hagan, D., Jung, K., Ramirez, A., Shaligram, S., Unger, C., Kwon, A., Slocum, et al  
2021; 2021: 4998-5004
- **Anesthesiologists Wake Up! It Is Time for Research and Innovative Medical Entrepreneurism.** *The journal of education in perioperative medicine : JEPM*  
Kwon, A. H., Varelmann, D., Karamnov, S., Slocum, A. H., Pradhan-Nabzdyk, L. K., Xu, J. L., Mauermann, W. J., Brown, D. R., Mantilla, C. B., Nabzdyk, C. G.  
2021; 23 (1): E657
- **Rapidly scalable mechanical ventilator for the COVID-19 pandemic** *INTENSIVE CARE MEDICINE*  
Kwon, A. H., Slocum, A. H., Varelmann, D., Nabzdyk, C. G. S., MIT E-Vent Team  
2020; 46 (8): 1642-1644
- **Genetics and Gender in Acute Pain and Perioperative Opioid Analgesia.** *Anesthesiology clinics*  
Kwon, A. H., Flood, P.  
2020; 38 (2): 341-55
- **Other Specialties Might Have a GPS** *ANESTHESIA AND ANALGESIA*  
Kwon, A. H., Nabzdyk, C. S.  
2017; 125 (6): 2164-2165
- **Why Anesthesiologists Could and Should Become the Next Leaders in Innovative Medical Entrepreneurism** *ANESTHESIA AND ANALGESIA*  
Kwon, A. H., Marshall, Z. J., Nabzdyk, C. S.  
2017; 124 (3): 998-1004
- **A 10-Month-Old With Intermittent Hypotonia and Paralysis** *PEDIATRICS*  
Beinvogl, B. C., Rosman, N. P., Baumer, F. M., Rodan, L. H., Forster, C. S., Kwon, A. H., Berry, G. T.  
2016; 138 (1)
- **Multivesicular liposomal bupivacaine at the sciatic nerve** *BIOMATERIALS*  
McAlvin, J., Padera, R. F., Shankarappa, S. A., Reznor, G., Kwon, A. H., Chiang, H. H., Yang, J., Kohane, D. S.  
2014; 35 (15): 4557-4564
- **Synthetic Ligand-Coated Magnetic Nanoparticles for Microfluidic Bacterial Separation from Blood** *NANO LETTERS*  
Lee, J., Jeong, K., Hashimoto, M., Kwon, A. H., Rwei, A., Shankarappa, S. A., Tsui, J. H., Kohane, D. S.  
2014; 14 (1): 1-5
- **Zn-DPA functionalized magnetic nanoparticles for selective microfluidic filtration of pathogens from blood**  
Lee, J., Jeong, K., Hashimoto, M., Kwon, A. H., Rwei, A., Shankarappa, S. A., Tsui, J. H., Langer, R., Kohane, D. S.

AMER CHEMICAL SOC.2013

- **Prolonged duration local anesthesia with minimal toxicity (vol 106, pg 7125, 2009) PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA**  
Epstein-Barash, H., Shichor, I., Kwon, A. H., Hall, S., Lawlor, M. W., Langer, R., Kohane, D. S.  
2011; 108 (10): 4264
- **Prolonged duration local anesthesia with minimal toxicity PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA**  
Epstein-Barash, H., Shichor, I., Kwon, A. H., Hall, S., Lawlor, M. W., Langer, R., Kohane, D. S.  
2009; 106 (17): 7125-7130
- **Cultivation of human embryonic stem cells without the embryoid body step enhances osteogenesis in vitro STEM CELLS**  
Karp, J. M., Ferreira, L. S., Khademhosseini, A., Kwon, A. H., Yeh, J., Langer, R. S.  
2006; 24 (4): 835-843
- **Design of a compact, battery powered, and fiber optic controlled Remotely Operated Vehicle**  
Brundage, H. M., Aquino, M., Cooney, L., Downey, B., Huo, E., Kwon, A., Stanway, M., Stefanov-Wagner, T., Stiehl, K., Walker, D.  
IEEE.2005: 772-777
- **A novel actuated tether design for rescue robots using hydraulic transients 2004 IEEE INTERNATIONAL CONFERENCE ON ROBOTICS AND AUTOMATION, VOLS 1- 5, PROCEEDINGS**  
Perrin, D. P., Kwon, A., Howe, R. D.  
2004: 3482-3487