

Emergence From the Coronavirus Disease 2019 Pandemic and the Care of Chronic Pain: Guidance for the Interventionalist

Timothy Deer, MD,*† Dawood Sayed, MD,‡ Jason Pope, MD,§ Krishnan Chakravarthy, MD, PhD,||¶ Erika Petersen, MD,# Susan M. Moeschler, MD,** Alaa Abd-Elseyed, MD, MPH,†† Kasra Amirdelfan, MD,‡‡ and Nagy Mekhail, MD, PhD,§§ the ASPN COVID Workgroup

BACKGROUND: The current Coronavirus Disease (COVID-19) pandemic led to a significant disruption in the care of pain from chronic and subacute conditions. The impact of this cessation of pain treatment may have unintended consequences of increased pain, reduced function, increased reliance on opioid medications, and potential increased morbidity, due to the systemic impact of untreated disease burden. This may include decreased mobility, reduction in overall health status, and increase of opioid use with the associated risks.

METHODS: The article is the study of the American Society of Pain and Neuroscience (ASPN) COVID-19 task force to evaluate the policies set forth by federal, state, and local agencies to reduce or eliminate elective procedures for those patients with pain from spine, nerve, and joint disease. The impact of these decisions, which were needed to reduce the spread of the pandemic, led to a delay in care for many patients. We hence review an emergence plan to reinstate this pain-related care. The goal is to outline a path to work with federal, state, and local authorities to combat the spread of the pandemic and minimize the deleterious impact of pain and suffering on our chronic pain patients.

RESULTS: The article sets forth a strategy for the interventional pain centers to reemerge from the current pandemic and to set a course for future events.

CONCLUSIONS: xxx. (Anesth Analg XXX;XXX:00–00)

GLOSSARY

ASPN = American Society of Pain and Neuroscience; **BMI** = body mass index; **CDC** = Centers for Disease Control and Prevention; **CMS** = Centers for Medicare & Medicaid Services; **COVID-19** = Coronavirus Disease 2019; **ED** = emergency department; **ESAS** = elective surgery acuity scale; **EU** = European Union; **HIPAA** = Health Insurance Portability and Accountability Act of 1996 (USA); **LMA** = laryngeal mask airway; **OR** = operating room; **PAPR** = powered air-purifying respirator; **PCR** = polymerase chain reaction; **PPE** = personal protective equipment; **R₀** = reproduction number; **SARS-CoV-2** = severe acute respiratory syndrome coronavirus 2; **WHO** = World Health Organization

The global Coronavirus Disease 2019 (COVID-19) pandemic has significantly impacted the way that medical care is provided to patients with pain. Early efforts were geared toward social distancing and decreasing the transmission of the virus. These measures lead to a temporary suspension of most interventional and in-person pain therapies. As clinicians move to the next phase of

providing pain treatment in the midst of an evolving pandemic, these guidelines were developed by an international COVID-19 taskforce of the American Society of Pain and Neuroscience (ASPN) to provide a general framework for providing responsible care of essential pain treatment while also outlining strategies aimed at decreasing risks to patients and health care workers.

From the *The Spine and Nerve Center of The Virginias, Charleston, West Virginia; †Department of Anesthesiology and Pain Medicine, WVU School of Medicine, Morgantown, West Virginia; ‡University of Kansas Medical Center, Kansas City, Kansas; §Evolve Restorative Center, Santa Rosa, California; ||Division of Pain Medicine, Department of Anesthesiology, University of California San Diego, San Diego, California; ¶VA San Diego Healthcare, San Diego, California; #Department of Neurosurgery, University of Arkansas for Medical Sciences, Little Rock, Arkansas; **Division of Pain Medicine, Mayo Clinic, Rochester, Minnesota; ††Anesthesiology, University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin; ‡‡IPM Medical Group, Inc, Walnut Creek, California; and §§Cleveland Clinic, Cleveland, Ohio.
Copyright © 2020 International Anesthesia Research Society
DOI: 10.1213/ANE.0000000000005000

Accepted for publication May 15, 2020.

Funding: Funded by the American Society of Pain and Neuroscience.

Conflicts of Interest: See Disclosures at the end of the article.

A full list of contributors can be found at the end of the article.

Dr Deer and Dr Sayed served as primary authors. All authors served as secondary authors contributing to substantial portions of the article. Dr Mekhail served as senior editor and made substantial edits to the article.

Reprints will not be available from the authors.

Address correspondence to Timothy Deer, MD, The Spine and Nerve Center of the Virginias, 400 Ct St, Suite 100, Charleston, WV 25304. Address e-mail to doctdeer@aol.com.

The Risks and Impact of Untreated Pain During the COVID-19 Pandemic

Pain is a frequent reason for emergency department (ED) visits. Pain accounts for 45%–75% of ED patient presentations, with half having moderate or severe pain.^{1–3} The current influx of ED visits to screen, confirm, and treat COVID-19 has proven challenging for many hospital systems. The increased demand has led to limitations on personal protective equipment (PPE), which puts health care personnel at risk. The addition of untreated chronic pain patients may lead to a further major overburdening of ED resources.

It is imperative that physicians treat chronic pain to minimize the immunosuppressive and deconditioning consequences of untreated suffering, and potentially increase survival in cancer patients.^{4,5} When our patients, communities, and health care systems are being adversely affected by a viral pandemic, optimizing overall well-being of our chronic pain patient populations should be a top priority.

GOVERNMENTAL RESPONSE TO THE PANDEMIC

Federal Response

On March 18, 2020, the Centers for Medicare & Medicaid Services (CMS) recommended limiting nonessential care and issued policy changes: (a) to allow for continued care while limiting exposure to COVID-19; (b) to expand surge capacity and preserve PPE; and (c) to provide guidance to providers and health systems.⁶ Before these policy changes, on March 9, 2020, CMS relaxed regulations to expand telehealth.⁷ Previous CMS provisions limited telehealth. Requirements for audio and video interaction remained.

On April 7, 2020, CMS recommended a 3-tier approach for triaging all nonessential medical services and procedures by acuity: (1) low acuity or elective (postpone); (2) intermediate acuity or urgent (consider postponement); and (3) high acuity or emergent (do not postpone).⁸ Several medical societies rapidly adopted this tier approach publishing best practice guidelines for classifying emergent procedures (eg, intrathecal pump refills) and urgent procedures (eg, acute disk herniation with radiculopathy).⁹

On April 16, 2020, CMS released guidelines with “Opening Up America Again,” which require planning to resume in-person nonemergent, non-COVID-19 care, which in turn follows 3 phases issued by the White House and the US Centers for Disease Control and Prevention (CDC) on April 16, 2020.^{10,11} These guidelines allow governors to implement phase reopening at the local level.¹⁰ These guidelines strongly encourage maximum use of telehealth. In regions with low incidence of COVID-19, offering non-COVID-19 elective in-person care can be offered if clinically appropriate.¹¹

State Response

During the COVID-19 pandemic, states followed the federal government in enacting regulations, expanding benefits, and loosening restrictions.^{8,12–16} A dilemma has emerged that shows limitations of a uniform policy in the United States based on variable state responses.¹⁷ States have relaxed both telehealth-based controlled substance prescribing and advanced practice provider scope, which varies in each region of the country.^{7,16}

US CDC protocols also address the postrecovery concerns. There is a need for post-COVID-19 health recovery strategy—one that is committed to mitigating the damage aftermath.^{10,11,18} The foundation for the guidelines around reopening health care facilities at the state and local levels draws on the requisites outlined in the National Coronavirus Response report.¹⁸ Provisions include universal COVID-19 testing capacity, public compliance with stay-at-home and physical distancing orders, and a public health and health care system with the capacity to respond to hotspots and outbreaks of COVID-19 as restrictions on movement and gathering lifted.

International Response

This guidance focuses on the United States, but insights can be gained from the response in other countries and regions. The first European COVID-19 case was documented in France in January 2020. In March 2020, the World Health Organization (WHO) declared Europe as the COVID-19 epicenter. Since that time, more than 2.5 million cases have been confirmed with Italy, France, Spain, and the United Kingdom most impacted. This has been complicated by the European Union (EU) rule that prevents global policy. Pain medicine practice has been restricted with other general practices in most EU countries, with Spain, Italy, and the United Kingdom declaring restrictions later in the timeline of infection.¹⁹ No current staged reopening plan exists for the EU.

Australia has a moderate incidence of COVID-19, and Asia has a high incidence of the disease. Current responses to pain treatment in Australia include decreased case utilization, and increased access to mental health care. Pain treatment procedures are available for essential workers and within 90 days of an acute condition. Restrictions have been placed in patients over the age of 70 years, with a body mass index (BMI) >40, and with poorly controlled comorbidities. For urgent procedures, a pain level greater than 7/10 is required, with severe pain that may limit function. To limit utilization, Australia has allowed for radiofrequency ablation without prior diagnostic blocks and spinal cord stimulation without a trial.

In general, Australia, China, Japan, South Korea, Hong Kong, and Singapore have followed a model of limited access to care for pain patients with a reopening

planned from July to September 2020 based on achieving a reproduction number (R_0) of <1 for COVID-19.²⁰

RECOMMENDATIONS FOR EMERGING FROM THE PANDEMIC

Proposed Definitions of Elective, Urgent-Elective, and Urgent Pain Interventions

CMS published recommendations in mid-March 2020 for nonemergent, elective medical services in a tiered framework of procedures.⁸ The American College of Surgeons has released recommendations in its Elective Surgery Acuity Scale (ESAS), along with guidelines and considerations for resuming elective surgeries.^{21,22} Interventional decisions now include an expanded discussion where the clinician and patient must weigh the clinical scenario and consider the periprocedural risks to the patient, clinical team, and local health care system (Table 1).

There are significant costs to canceling or postponing interventional pain procedures, as untreated pain can cause anxiety, depression, loss of sleep, inability to work, and diminished quality of life.²³⁻²⁵ Though scoring systems have been implemented to determine procedure appropriateness, physician medical judgment remains the hallmark determining whether delaying a surgery or procedure will cause serious adverse medical consequences.²⁶ Suggested definitions specifically for the urgency and timing of interventional pain procedures are

Elective: These procedures are not time-sensitive; that is, a patient normally could or would wait for >4 weeks to undergo the surgery or procedure based on the unique circumstances. This includes procedures where the delay of the procedure or surgery can be managed more conservatively over a short time period, and no significant additional patient harm is anticipated.

Urgent elective: These procedures are time-sensitive; that is, a patient normally could not wait for 2–4 weeks to undergo the surgery or procedure being considered, for unique circumstances. In addition, this includes procedures where a delay of the procedure or surgery for more than a few weeks could potentially lead to a worsening of a patient’s condition.

Urgent: These procedures are time-sensitive; that is, a delay in proceeding with a surgery or procedure would result in significant exacerbation and worsening of the condition and result in other demands on the health care system, such as emergency department visit, inpatient hospitalization, or unintended consequence of escalated doses of analgesics. The physician should document why the decision was made, and the patient should be properly informed.

Table 1. Considerations for Pain Interventions During COVID-19 Pandemic

Consideration	Questions
Patient’s likelihood of current COVID-19 infection	Has the patient recently completed travel to regions with high incidence or recent surge? Do they report COVID-19–like symptoms?
Immunosuppression occurs in some individuals due to chronic pain	Would the patient’s risk of infection be substantially elevated by undergoing the procedure? Will the procedure improve immune function, through reduced pain or avoiding drugs (anti-inflammatories/opioids)?
Resource availability	Will the procedure require critically limited supplies (certain drugs or PPE) or care (hospital bed)?
Risk of worsening condition	Is the patient’s condition likely to lead to lasting morbidity or mortality if untreated?
Risk of emergency service utilization	Is the patient’s condition likely to become urgent? Is their condition severe and intractable?

Abbreviations: COVID-19, Coronavirus Disease 2019; PPE, personal protective equipment.

The present ASPN COVID Work Group recommends that if the locality or region has adequate medical resources and PPE to handle current and near-term projected COVID-19 cases, clinicians can proceed with all urgent and urgent-elective interventional pain procedures while using proper social distancing, screening, and testing recommendations.

Some experts have advocated the surgeries and interventional pain procedures being categorized with the nomenclature of “essential” versus “nonessential” instead of elective, urgent elective, and urgent to mitigate confusion with government restrictions. The decision to proceed with elective interventional pain procedures can also be considered given the risks of delaying care for patients. Another important factor to consider is that the majority of pain-related procedures can be performed in an office or outpatient setting, reducing the burden on inpatient facilities taking care of the critically ill COVID-19 patients. As a “reopening” proceeds in the summer of 2020, clinicians should continue to exercise case-by-case discretion in scheduling elective pain procedures.

Screening of Patients for Pain Procedures

COVID-19 screening before any pain-related procedure should follow a comprehensive, systematic approach for every individual patient. It is vitally important that proper steps are followed to minimize asymptomatic transmission of the virus. In accordance with CDC guidelines, we recommend these screening steps for common pain treatment injections:²⁷

1. Before arrival to facility
 - a. Patients should be contacted by telephone when scheduling procedures, screening for symptoms of COVID-19, or reporting any previous infections or known contact with confirmed COVID-19–positive individuals.

- b. Advise patients to check their temperature at home before their procedure. If febrile, the patient should notify the facility performing the injection. If afebrile, the patient can proceed to the facility.
 - c. Encourage patients to notify your staff before leaving their home if they have had a fever or other symptoms suggestive of COVID-19.
 - d. COVID-19 testing at least 48 hours preprocedure on patients requiring general anesthesia.
2. On arrival to facility
 - a. Ensure all patients enter the facility through a common location while maintaining social distancing and face masks to screen effectively and limit risk of asymptomatic transmission.
 - b. Screen all patients for possible symptoms of COVID-19, including cough, shortness of breath or difficulty breathing, fever, chills, repeated shaking with chills, muscle pain, headache, sore throat, or new loss of taste or smell.

Advanced procedures, including spinal cord stimulation, dorsal root ganglion stimulation, and intrathecal drug delivery, may require additional screening tools to ensure patient and health care personnel safety. Due to aerosolization, intubation and extubation are both high-risk time periods for exposure, so limiting general anesthesia on COVID-19–positive individuals is essential.^{28,29} In addition to the above screen measures, one could consider these additional tests preoperatively:

1. Polymerase chain reaction (PCR) testing
 - a. Throat swab and nasal swab samples are typically used for reverse transcriptase-PCR testing. Unfortunately, due to inadequate sample collection and performance, PCR may have a high false-negative rate.³⁰ Serial testing would improve the sensitivity of the test.
2. Serology testing
 - a. Serology testing involves searching for the presence of antibodies, which would indicate that a person had a prior COVID-19 infection and produced an immune response to the virus. These results are particularly important for those individuals with few or no symptoms. Since it takes the body 1–2 weeks to make antibodies, this is not the ideal test for symptomatic patients.³¹

Utilization of Telemedicine for Pre- and Postprocedure Evaluations

The COVID-19 pandemic has brought telemedicine to the forefront of patient care, as clinicians were required to utilize remote assessment strategies during ubiquitous “shelter in place” orders, limiting in-person visits to only those deemed urgent. During the

pandemic, the 1135 CMS waiver relaxed compliance requirements for synchronous audio/video encounters, and subsequently, CMS granted more accessibility to telehealth visits through non–Health Insurance Portability and Accountability Act of 1996 (HIPAA) compliant systems.

Telemedicine is being used to provide pre/postprocedural consultation, intermittent remote outcome monitoring, and patient procedural education, along with streamlining preauthorization before performing many procedures.

Preoperative considerations for the use of telehealth should be applied for reviewing laboratory results, and radiological imaging; obtaining a history and physical, and patient consent; and tracking longitudinal outcomes. Emphasis should be placed on reassessing comorbidities and risk/benefit, especially if a procedure was postponed due to COVID-19. Telemedicine should also focus on procedural prioritization and determine which patients are emergent versus urgent versus elective.^{32,33} Remote patient education about the procedure and expectation alignment can be accomplished. These efforts include education packets, consent forms, and scheduling. Telemedicine during the postprocedure period has been used predominantly in 3 ways, including scheduled follow-up, routine monitoring, and management of arising issues.³⁴

PPE Requirements for Interventional Pain Procedures

PPE is used to reduce the exposure to body fluids or infectious agents.³⁵ During the COVID-19 pandemic, the balance is to protect the patient and interventionalist from severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and other infectious agents, while being mindful of the local PPE supply chain.

If patients are deemed or confirmed to be SARS-CoV-2 positive, transmission-based precautions must be exercised. The CDC recommends contact and droplet precautions for those with SARS-CoV-2.³⁶ If aerosol-generating procedures are performed, airborne precautions are recommended.³⁷ If adequate testing can be accomplished, typical standard precautions with sterile technique can be performed for interventional pain procedures and surgeries. Interventional pain procedures can be categorized based on 3 factors: percutaneous versus incisional/surgical procedure; short versus prolonged neuraxial entry; and aerosol-generating procedures versus nonaerosol-generating procedures.

Most percutaneous interventional pain procedures are performed using a surgical cap, mask, and gloves, without a gown. Examples include epidural steroid injections and peripheral nerve blocks. When an individual is performing a percutaneous procedure with

Table 2. Step-Wise Response of Interventional Pain Practices in Case of Future Pandemics

Response Step	Consensus Recommendations
1.	Align practice and community actions with the magnitude and phase of the pandemic, in accordance with WHO guidelines: need for rapid containment in affected areas; readiness for response in nonaffected ones. ⁴⁰
2.	Form a standard safety check process for screening patients who may require in-person visits, that is, urgent visits or intrathecal drug pump refills.
3.	Assess the stock and conserve PPE by limiting office visits and procedural encounters.
4.	Hold all nonessential procedures and limit in-person clinic visits, while considering interventions necessary to avoid emergency room visits due to pain. ⁴¹
5.	Conduct financial assessment of essential versus nonessential practice expenses and overhead.
6.	Consider financial assistance from government and private loan assistance programs, if needed, early on.
7.	Conduct most patient care through virtual environments (telemedicine).
8.	Plan for resumption of normal workflow with considerations for advanced screening.

Abbreviations: PPE, personal protective equipment; WHO, World Health Organization.

prolonged neuraxial access, such as spinal cord stimulation trial or kyphoplasty, it is recommended that a gown be used, in addition to the aforementioned barriers.³⁸ In patients with SARS-CoV-2, all of these precautions should remain, with the addition of an eye shield or face shield to adhere to droplet precautions.

When an incisional/surgical procedure is performed, a surgical cap and mask; goggles, eye shield, or face shield; gown; and gloves should be used. The decision to replace the surgical mask to an N95 respirator mask or a powered air-purifying respirator (PAPR) is dependent on whether an aerosol-generating procedure is performed, such as endotracheal intubation or laryngeal mask airway (LMA) placement. Currently, after intubation, depending on the air-exchange rate of the operating room (OR), it is recommended that 15–30 minutes pass before the remaining personnel enter the OR. During a COVID-19 outbreak, it is important to reduce the waste of PPE. Current recommendations to maintain a supply of N95 respirator mask are to sterilize per protocol and reuse, if possible, at your facility. Previously published literature recommends to not reuse N95 masks more than 5 times, in the absence of recommendations from the manufacturer.³⁹

A Step-Wise Response to Future Pandemics

Advance planning and a rapid response are crucial in reducing the impact of a pandemic. The continuum of the pandemic can be generalized into 2 categories: interpandemic and pandemic phases. The pandemic phase can be further categorized into the alert, pandemic, and transition phases.

As a “flattening of the curve” and a deceleration interval of new COVID-19 cases are expected, it would be prudent to evaluate our preparedness and strategies to mitigate the impact of inevitable future pandemics. Since most chronic pain care is delivered via outpatient clinical venues, collaboration, information sharing, and coordination of our response is paramount. Table 2 summarizes a step-wise approach.

The interventional pain management practices should be prepared to generate a step-wise response in case of future pandemics. This is especially true to appropriately treat patients, while maintaining a financially sound and solvent medical practice.

CONCLUSIONS

The unexpected COVID-19 pandemic exposed a global medical community that was unprepared for the unprecedented challenges at hand. Many have focused on ventilators, intensive care beds, and PPE, but interventional pain physicians and the patients they care for were also overwhelmed by the emergent actions needed for disease mitigation. This led to the under treatment of pain, with unintentional yet associated potential harm to those patients who had their interventional pain care delayed or canceled. At this point in time, we recommend a staged emergence from the current treatment limitations and propose a future road map to meet similar challenges going forward. ■■

ACKNOWLEDGMENTS

The authors thank Allison Foster, PhD, an independent medical writer, for assistance in preparation of the manuscript.

DISCLOSURES

Name: Timothy Deer, MD.

Contribution: This author conceived, contributed, revised, and is accountable for the final manuscript.

Conflicts of Interest: T.D. is a consultant to Abbott, Axonics, Flowonix, Saluda Medical, Vertos, SpineThera, Nalu, Medtronic, Nevro, SI Bone, Stingenics, SPR Therapeutics, Cornerloc, Boston Scientific, and Vertiflex; received research support from Abbott, Vertos, Mainstay Medical, Saluda, SPR Therapeutics, Boston Scientific, and Vertiflex; advisory board for Abbott, Vertos, Flowonix, Nalu, SPR Therapeutics, and Vertiflex; holds equity in Bioness, Vertiflex, Axonic, Vertos, SpineThera, Saluda Medical, Nalu, Cornerloc, and SPR Therapeutics; and patent pending with Abbott.

Name: Dawood Sayed, MD.

Contribution: This author conceived, contributed, revised, and is accountable for the final manuscript.

Conflicts of Interest: D.S. is a consultant to Abbott, Boston Scientific, Flowonix, Medtronic, Nevro, PainTEQ, SPR Therapeutics, Vertos, and Vertiflex.

Name: Jason Pope, MD.

Contribution: This author conceived, contributed, revised, and is accountable for the final manuscript.

Conflicts of Interest: J.P. is a consultant to Abbott, Saluda, Boston Scientific, Flowonix, SPR Therapeutics, Thermoquil, Medtronic, PainTEQ, Vertos, Vertiflex, Ethos, Celeri Health, and Neural Integrative Solutions.

Name: Krishnan Chakravarthy, MD, PhD.

Contribution: This author conceived, contributed, revised, and is accountable for the final manuscript.

Conflicts of Interest: K.C. is a consultant to Abbott, Medtronic, Boston Scientific, MedinCell, Bioness, Saluda Medical, and SPR Therapeutics; founder of Douleur Therapeutics and Newrom Biomedical; and holds stock options in Nalu Medical, Oska Wellness, and Higgs Boson Health.

Name: Erika Petersen, MD.

Contribution: This author conceived, contributed, revised, and is accountable for the final manuscript.

Conflicts of Interest: E.P. is the current consultant to Abbott/St. Jude Medical, Medtronic Neuromodulation, Nevro, Neuros Medical, and ReNeuron; past consultant to Boston Scientific; received research and educational support from Nevro, Neuros Medical, ReNeuron, and Medtronic Neuromodulation; and holds stock options in SynerFuse.

Name: Susan M. Moeschler, MD.

Contribution: This author conceived, contributed, revised, and is accountable for the final manuscript.

Conflicts of Interest: S.M.M. is the Director at Large, North American Neuromodulation Society (NANS).

Name: Alaa Abd-Elseyed, MD, MPH.

Contribution: This author conceived, contributed, revised, and is accountable for the final manuscript.

Conflicts of Interest: A.A.-E. is a consultant to Medtronic, StimWave, and Avanos.

Name: Kasra Amirdehfan, MD.

Contribution: This author conceived, contributed, revised, and is accountable for the final manuscript.

Conflicts of Interest: K.A. is a consultant to Saluda, Boston Scientific, Medtronic, Nevro, Mesoblast, Vivex, Biotronik, and PainTEQ.

Name: Nagy Mekhail, MD, PhD.

Contribution: This author conceived, contributed, revised, and is accountable for the final manuscript.

Conflicts of Interest: N.M. is a consultant to Boston Scientific, Sollis Therapeutics, and Relievan Medsystems; received research support from Mallinckrodt, Mesoblast, Avanos (Halyard), and Neuros Medical and was a medical monitor on studies sponsored by Saluda, Nevro, and Vertos.

This manuscript was handled by: Honorio T. Benzon, MD.

CONTRIBUTORS

The ASPN COVID Workgroup is comprised of Ajay Antony, MD (The Orthopedic Institute, Gainesville, FL); Rany T. Abdallah, MD, PhD, MBA (Department of Anesthesiology, University of Vermont Health System, Burlington, VT); David Abejón, MD, PhD, FIPP (Head of Pain Unit, Hospital Universitario Quironsalud, Madrid, Spain); Complejo Hospitalario Rúber Juan Bravo, Madrid, Spain); Nomen Azeem, MD (Florida Spine & Pain Specialists, Riverview, FL); Jonathan D. Carlson, MD (Pain Specialist, ABMS Double Board Certified in Anesthesiology and Pain Management,

Hawaii Pain & Spine, Kailua, Hawaii); Tim Davis, MD (Source Healthcare, Santa Monica, CA); Sudhir Diwan, MD (President, Advanced Spine on Park Avenue, New York City, NY; Associate Clinical Professor, Albert Einstein Medical College, New York City, NY); Attending, Lenox Hill Hospital, New York City, NY); Shravani Durbhakula, MD (Johns Hopkins School of Medicine, Baltimore, MD); Alyson M. Engle, MD (Department of Anesthesiology and Perioperative Medicine, University of Pittsburgh School of Medicine, Pittsburgh, PA); Steven Falowski, MD (Neurosurgical Associates of Lancaster, Lancaster, PA); Stanley Golovac, MD (Board certified in Anesthesiology and Pain Medicine, Founder of Florida Pain Institute, Melbourne, FL); Johnathan Goree, MD (Department of Anesthesiology, University of Arkansas for Medical Sciences, Little Rock, AR); Jay Grider, DO, PhD, MBA (Division of Pain Medicine, Department of Anesthesiology, University of Kentucky College of Medicine, Lexington, KY); Amitabh Gulati, MD, FIPP, CIPS (Associate Attending and Director of Chronic Pain, Memorial Sloan Kettering Cancer Center, New York, NY); Jonathan M. Hagedorn, MD (Department of Anesthesiology and Perioperative Medicine, Division of Pain Medicine, Mayo Clinic, Rochester, MN); Navdeep S. Jassal, MD (Founder, Spine & Pain Institute of Florida, Lakeland, FL; Assistant Clinical Professor, Department of Neurology/Pain, University of South Florida, Tampa, FL; Assistant Professor, Department of Physical Medicine and Rehabilitation, University of Central Florida, Orlando, FL); Hemant Kalia, MD, MPH, FIPP (Rochester Regional Health System, Rochester, NY, USA. Clinical Assistant Professor, Department of Physical Medicine & Rehabilitation, University of Rochester, NY); Timothy Lubenow, MD (Professor of Anesthesiology/Pain Fellowship Program Director/Director of Section of Pain Medicine, Rush University Medical Center, Chicago, IL); Jasmine R. Marcelin, MD, FACP (University of Nebraska Medical Center, Omaha, NE); Ramana K. Naidu, MD (California Orthopedics and Spine, Larkspur, CA); Rick M. Paicius, MD (Southern California Spine and Sport, Newport Beach, CA); Dipan Patel, MD (Garden State Pain Control Center, Clifton, NJ); Louis J. Raso, MD (Jupiter Interventional Pain Management, Jupiter, FL); Natalie H. Strand, MD (Department of Anesthesiology, Division of Pain Medicine, Mayo Clinic, Phoenix, AZ); Harry Sukumaran, MD (Program Director, Pain Fellowship, Assistant Professor of Anesthesiology and Pain Medicine, Detroit Medical Center/Wayne State University, Detroit, MI); Paul Verrills, MBBS, FAFMM, GDMM (Hons), MM (Pain Medicine), FIPP (Metro Pain Group, Melbourne, Australia); Jackie Weisbein, DO (Interventional Pain Management, Napa Valley Orthopaedic Medical Group, Napa, CA).

R.T.A. is a consultant to Medtronic, Abbott, SPR Therapeutics, and Avanos. D.A. is a consultant to Boston Scientific, Abbott, Medtronic, Grünenthal, Cardiva 2, and Nevro. A.A. is a consultant to Abbott, Boston Scientific, and PainTEQ. N.A. is a consultant for Abbott and SPR Therapeutics; advisory board for Boston Scientific (Vertiflex) and Vertos Medical; speaker

for Horizon Pharma. J.D.C. is a consultant to Abbott, CornerLoc, Boston Scientific (Vertiflex), Saluda, SPR Therapeutics, Pill Nurse, and Biotroniks; Treasurer and Executive Board of Directors for American Society of Pain and Neuroscience (ASPN). T.D. is a consultant to Abbott Neuromodulation, Halyard Health (Avanos), Nuvectra, and Tenex Health; received research support from Abbott Neuromodulation, Biostar, Discgenics, Halyard Health (Avanos), Kolon Tissuegene, Mesoblast, Nevro, Nuvectra, and Vivex; speaker for Abbott Neuromodulation, Tenex Health, and Vertiflex; advisory board for Biostar, Halyard Health (Avanos), Kolon Tissuegene, Vertiflex, and Vivex; holds equity in Broadway Surgical Institute, Compass Pathways, Nevro, Nuvectra, Paradigm Spine-RTI, Prosidyan, and Tenex Health; owner/CEO of Alpha Diagnostics; founder of Source Healthcare and Source Surgery Center; and board of directors for Broadway Surgical Institute. S.D. is a speaker for Advanced Regenerative Medicine Institute (ARMI), and Apex Biologix; and advisory board for Boston Scientific, CornerLoc, and IntraVu. S.D. received research funding from Nevro. S.F. is a consultant to Abbott, Medtronic, Boston Scientific, Vertiflex, and Vertos; received research support from Abbott, Medtronic, Vertiflex, Boston Scientific, Biotronik, Stimgenics, and Saluda; holds equity in Thermaquil, SPR Therapeutics, Saluda, CornerLoc, Stimgenics, AGR, SpineThera, Celeri, and Neural Integrative Solutions. J.G. is a consultant to Abbott and Stratus Medical. J.G. is a consultant to Abbott, Vertos, Medtronic, Flowonix, Intralink Spine. A.G. is a consultant to Medtronic, Flowonix, SPR Therapeutics, Nalu Medical, and Bausch Health; and advisory board of AIS. N.S.J. received research support from Vertos and Flowonix; and advisory board for Abbott, Vertos, Flowonix, and CornerLoc. H.K. received research support from Abbott; advisory board for Omnia Medical; and board of directors for Monroe County Medical Society. T.L. is a consultant to Abbott, Boston Scientific, Medtronic, Nevro, Avanos, and Flowonix. R.K.N. is a consultant to Abbott, Avanos, Bicycle Health, Boston Scientific, CereVu, DoctorPlan, ExerAI, KarunaLabs, Nalu, Omnia Medical, Sonosite, SPR Therapeutics, and Vertos. R.M.P. is a consultant to Boston Scientific, Abbott, and Vertos; and received research support from Boston Scientific, Abbott, Vertos, and Mesoblast. D.P. is a consultant to Abbott, Boston Scientific, Nalu, and Relievant. H.S. is a consultant to Abbott and Vertos Medical. J.W. is a consultant to Medtronic, Boston, Abbott, Vertos, and Omnia; and advisory board for Abbott, Vertos, and Omnia. A.M.E., S.G., J.M.H., J.R.M., L.J.R., and N.H.S. have no conflicts to declare. All the authors conceived, contributed, revised, and are accountable for the final manuscript.

REFERENCES

- Samcam I, Papa L. Acute pain management in the emergency department. IntechOpen Publishing. 2016.
- Chang HY, Daubresse M, Kruszewski SP, Alexander GC. Prevalence and treatment of pain in EDs in the United States, 2000 to 2010. *Am J Emerg Med*. 2014;32:421–431.
- Motov SM, Nelson LS. Advanced concepts and controversies in emergency department pain management. *Anesthesiol Clin*. 2016;34:271–285.
- Smith TJ, Staats PS, Deer T, et al; Implantable Drug Delivery Systems Study Group. Randomized clinical trial of an implantable drug delivery system compared with comprehensive medical management for refractory cancer pain: impact on pain, drug-related toxicity, and survival. *J Clin Oncol*. 2002;20:4040–4049.
- Smith TJ, Coyne PJ, Staats PS, et al. An implantable drug delivery system (IDDS) for refractory cancer pain provides sustained pain control, less drug-related toxicity, and possibly better survival compared with comprehensive medical management (CMM). *Ann Oncol*. 2005;16:825–833.
- Centers for Medicare & Medicaid Services. Coronavirus (COVID-19) partner toolkit. Available at: <https://www.cms.gov/outreach-education/partner-resources/coronavirus-covid-19-partner-toolkit>. Accessed April 20, 2020.
- Centers for Medicare & Medicaid Services. Medicare telemedicine health care provider fact sheet. Available at: <https://www.cms.gov/newsroom/fact-sheets/medicare-telemedicine-health-care-provider-fact-sheet>. Accessed April 20, 2020.
- Centers for Medicare & Medicaid Services. Non-emergent, elective medical services, and treatment recommendations. Available at: <https://www.cms.gov/files/document/cms-non-emergent-elective-medical-recommendations.pdf>. Accessed April 20, 2020.
- Cohen SP, Baber ZB, Buvandendran A, et al. Pain management best practices from multispecialty organizations during the COVID-19 pandemic and public health crises. *Pain Med*. 2020. Epub ahead of print.
- Centers for Medicare & Medicaid Services. Opening up America again: Re-opening facilities to provide non-emergent non-COVID-19 healthcare: phase I. Available at: <https://www.cms.gov/files/document/covid-flexibility-reopen-essential-non-covid-services.pdf>. Accessed April 21, 2020.
- White House (USA). Guidelines: Opening up America again. Available at: <https://www.whitehouse.gov/opening-america/#criteria>. Accessed April 21, 2020.
- State Governor of New York. Executive order no. 202. Available at: https://www.governor.ny.gov/sites/governor.ny.gov/files/atoms/files/EO_202.pdf. Accessed April 20, 2020.
- State Governor of Illinois. Executive order in response to COVID-19 (COVID-19 executive order no. 20). Available at: <https://www2.illinois.gov/Pages/Executive-Orders/ExecutiveOrder2020-22.aspx>. Accessed April 20, 2020.
- State Governor of Tennessee. Executive order no. 20. Available at: <https://publications.tnsosfiles.com/pub/execorders/exec-orders-lee20.pdf>. Accessed April 20, 2020.
- State Governor of Montana. Executive orders 2-2020 and 3-2020. Available at: <http://governor.mt.gov/Portals/16/Directive%20on%20Hospital%20Surge%20Capacity.pdf?ver=2020-03-23-202741-340>. Accessed April 20, 2020.
- Association of State and Territorial Health Officials. Administrative preparedness: strategies for managing and streamlining COVID-19 response and recovery. Available at: <https://www.astho.org/COVID-19/Strategies-for-Managing-and-Streamlining-Response-and-Recovery/>. Accessed April 18, 2020.
- Pennsylvania Department of Health. Interim Pennsylvania crisis standards of care for pandemic guidelines, version 2. Available at: <https://www.health.pa.gov/topics/Documents/Diseases%20and%20Conditions/COVID-19%20Interim%20Crisis%20Standards%20of%20Care.pdf>. Accessed April 18, 2020.

18. American Enterprise Institute. National coronavirus response: a road map to reopening. Available at: <https://www.aei.org/wp-content/uploads/2020/03/National-Coronavirus-Response-a-Road-Map-to-Recovering-2.pdf>. Accessed April 18, 2020.
19. Agencia Estatal Boletín Oficial del Estado. Real decreto 463/2020, de 14 de Marzo, por el que se declara el estado de alarma para la gestión de la situación de crisis sanitaria ocasionada por el COVID-19. BOE-A-2020-3692. Available at: <https://www.boe.es/eli/es/rd/2020/03/14/463>. Accessed April 20, 2020.
20. Centre for Evidence-Based Medicine. "When will it be over?": an introduction to viral reproduction numbers, R0 and Re. Available at: <https://www.cebm.net/covid-19/when-will-it-be-over-an-introduction-to-viral-reproduction-numbers-r0-and-re/>. Accessed April 23, 2020.
21. American College of Surgeons. COVID-19: guidance for triage of non-emergent surgical procedures. Available at: <https://www.facs.org/about-acsc/covid-19/information-for-surgeons/triage>. Accessed April 18, 2020.
22. American College of Surgeons. Local resumption of elective surgery guidance. Available at: <https://www.facs.org/covid-19/clinical-guidance/resuming-elective-surgery>. Accessed April 19, 2020.
23. Lautenbacher S, Kundermann B, Krieg JC. Sleep deprivation and pain perception. *Trifq!N fe!Sfw* 2006;10:357–369.
24. Barry DT, Pilver C, Potenza MN, Desai RA. Prevalence and psychiatric correlates of pain interference among men and women in the general population. *K Qtzd! jbu! Sft*. 2012;46:118–127.
25. Tang NK, Crane C. Suicidality in chronic pain: a review of the prevalence, risk factors and psychological links. *Qtzd! prh N fe*. 2006;36:575–586.
26. Prachand VN, Millner RM, Angelos P, et al. Medically-necessary, time-sensitive procedures: a scoring system to ethically and efficiently manage resource scarcity and provider risk during the COVID-19 pandemic. *KBn !Dprnt!vsh*. 2020. Epub ahead of print.
27. Centers for Disease Control and Prevention. Screening and triage at intake. Available at: https://www.cdc.gov/coronavirus/2019-ncov/hcp/dialysis/screening.html?CDC_AA_refVal=https%3A%2F%2Fwww.cdc.gov%2Fcoronavirus%2F2019-ncov%2Fhealthcare-facilities%2Fdialysis%2Fscreening.html#screen-patients. Accessed April 19, 2020.
28. Rowlands J, Yeager MP, Beach M, Patel HM, Huysman BC, Loftus RW. Video observation to map hand contact and bacterial transmission in operating rooms. *Bn !KJog!d!Dpouspm* 2014;42:698–701.
29. Loftus RW, Koff MD, Birnbach DJ. The dynamics and implications of bacterial transmission events arising from the anesthesia work area. *Boftu !Bobh*. 2015;120:853–860.
30. Ai T, Yang Z, Hou H, et al. Correlation of chest CT and RT-PCR testing in coronavirus disease 2019 (COVID-19) in China: a report of 1014 cases. *Sbejprphz*. 2020. Epub ahead of print.
31. Centers for Disease Control and Prevention. Serology testing for COVID-19. Available at: <https://www.cdc.gov/coronavirus/2019-ncov/lab/serology-testing.html>. Accessed April 19, 2020.
32. Bednarski BK, Slack RS, Katz M et al. Assessment of ileostomy output using telemedicine: a feasibility trial. *E jt!Dprpo! Sfdwn*. 2018;61:77–83.
33. Canon S, Shera A, Patel A et al. A pilot study of telemedicine for post-operative urological care in children. *KUfrfn fe! Ufrf!bsf*. 2014;20:427–430.
34. Williams AM, Bhatti UF, Alam HB, Nikolian VC. The role of telemedicine in postoperative care. *N i fbni*. 2018;4:11.
35. Centers for Disease Control and Prevention. Guide to infection prevention in orthopedic and pain management office settings. Available at: https://www.cdc.gov/infectioncontrol/pdf/Ortho-Pain-Guide_508.pdf. Accessed April 23, 2020.
36. Centers for Disease Control and Prevention. Interim U.S. guidance for risk assessment and public health management of healthcare personnel with potential exposure in a healthcare setting to patients with coronavirus disease 2019 (COVID-19). Available at: <https://www.cdc.gov/coronavirus/2019-ncov/hcp/guidance-risk-assessment-hcp.html>. Accessed April 23, 2020.
37. Centers for Disease Control and Prevention. Infection control basics: Transmission-based precautions. Available at: <https://www.cdc.gov/infectioncontrol/basics/transmission-based-precautions.html>. Accessed April 23, 2020.
38. Smith C, King W, O'Brien D Jr, Laseter J; Spine Intervention Society's Patient Safety Committee. Masks, gowns, and caps for interventional spine pain procedures. *Qbjo!N fe*. 2018;19:1293–1294.
39. Fisher EM, Shaffer RE. Considerations for recommending extended use and limited reuse of filtering facepiece respirators in health care settings. *KP ddvq! Fowjspo! I zh*. 2014;11:D115–D128.
40. Fineberg HV. Pandemic preparedness and response—lessons from the H1N1 influenza of 2009. *O!FohrhKN fe*. 2014;370:1335–1342.
41. Shanthanna H, Strand NH, Provenzano DA, et al. Caring for patients with pain during the COVID-19 pandemic: consensus recommendations from an international expert panel. *Bobftu! ftjb*. 2020. Epub ahead of print.