

Editorial

e COVID-19 Special Issue Editorial

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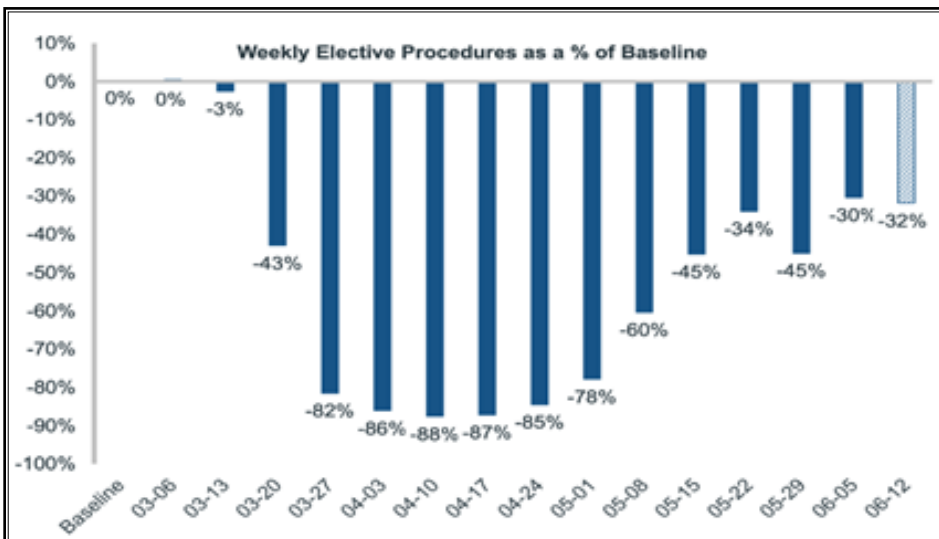
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The first reported cases of coronavirus disease 2019 (COVID-19), caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), originated in Wuhan city, Hubei province, China in December 2019. The disease rapidly started spreading to various countries. On March 11, 2020, the World Health Organization (WHO) declared the outbreak to be a pandemic. Subsequently, a national lockdown was instituted in the United States. Ever since these emergencies went into effect, medical professionals, along with the interventional pain management community, has seen a pandemic decimate elective interventional procedures and new patient visits. However, emergency services and follow-up evaluation and management visits have been continued with telehealth, specifically with a telephone only option. Health care utilization and spending changed substantially during the lockdown process (1). Elective surgeries declined up to 87% in March and April, with a slow recovery across the country, with a 32% decline in June 2020 as shown in Fig. 1 (2). Overall, spending on health services was relatively flat in the first quarter of 2020; however, it dropped sharply in March and April of 2020. The sharp drop in health services spending during the pandemic



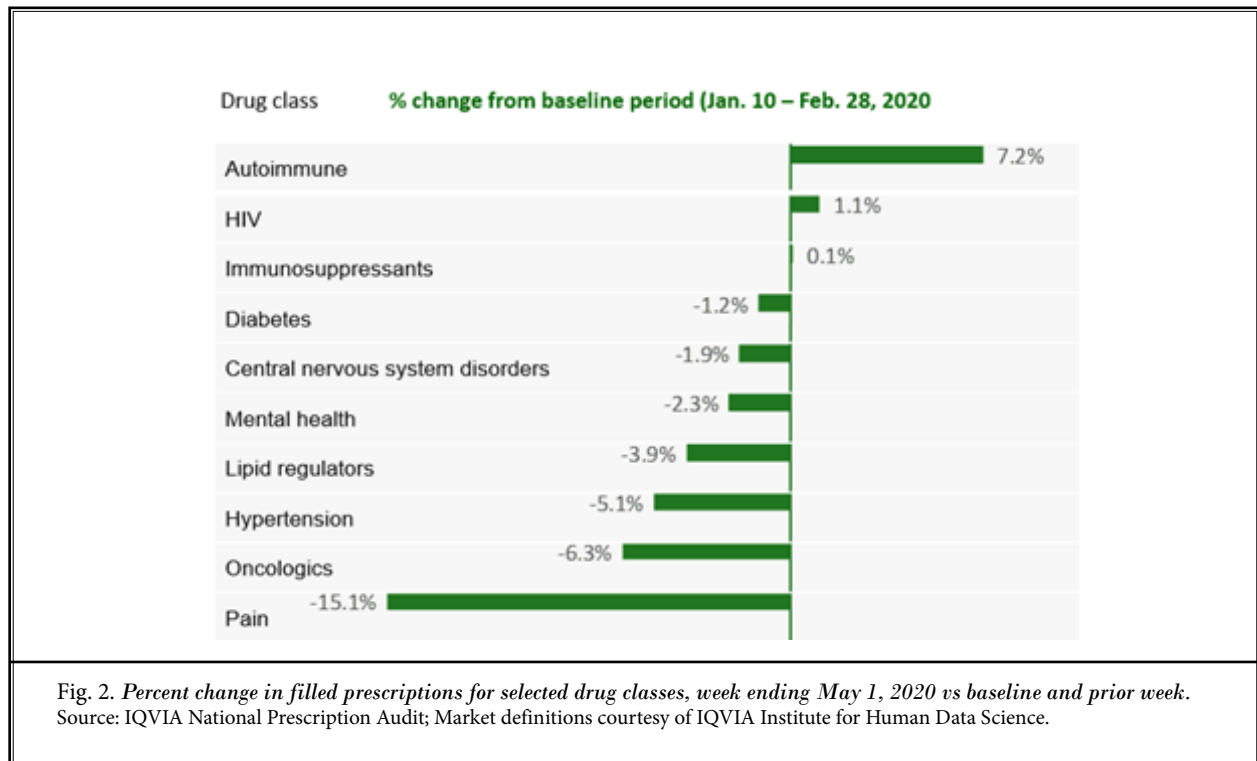
Data for latest week date controlled against prior periods; estimates have been applied to reflect anticipated late-adjudicated claims based on historical rates

Fig. 1. Weekly elective procedures as a % of baseline. Source: IQVIA: Medical Claims Data Analysis (2), 2020; Baseline = Average of procedures for period W/E 1/10/2020-2/28/2020. Elective procedures based on IQVIA custom analysis. Estimated amounts for latest 2 weeks applied based on likely claims still to be received due to data latency or claim processing delays.

is unprecedented. Almost all health care professionals lost revenues in April, May and June amid social distancing measures and reopening phases. Private insurers have reported significant drops in utilization and facility discharges; however, telemedicine use increased sharply in the early weeks of the pandemic and began to flatten in June of 2020 (1). As of late April, the total number of filled prescriptions was down, but was showing signs of rebound. Overall, pain prescriptions were down 15.1%, oncologics 6.3%, hypertension 5.1%, and lipid regulators 3.9% as shown in Fig. 2 (1). Only human immunodeficiency virus (HIV) and autoimmune drugs increased.

To add to already existing issues with the lockdown of medical services, a new US health crisis started looming as patients without COVID-19 began to delay care (3). The preliminary data shows that emergency department use dropped by 42% during the first 10 weeks of the pandemic despite a rise in patients presenting with symptoms of the coronavirus. In addition, during the same period, patients seeking care for myocardial infarctions dropped 23% and stroke by 20%. Above all, in the shadow of the pandemic, US drug overdose deaths started resurging to record levels (4-13). Drug deaths in the United States, which

fell for the first time in 25 years in 2018, rose to record numbers in 2019 and are continuing to climb to epidemic proportions with a resurgence that is adding to the COVID-19 epidemic by essentially creating another concurrent epidemic. In 2019, 72,000 Americans died from drug overdose based on the preliminary report by the Centers for Disease Control and Prevention (CDC), an increase of 5% from 2018. Once again, the majority of this increase in deaths were attributed to synthetic fentanyl and other drugs as well as, increasing deaths due to heroin and meth. The only silver lining for pain physicians and chronic pain patients is that deaths due to common prescription opioids decreased. In fact, prescription opioid deaths decreased from 14,975 to 12,068, a 4.2% decline from 2018 to 2019, on top of the 14.5% drop from 2017 to 2018, as shown in Fig. 3 (5-7). Unfortunately, the numbers for 2020 are ominous with deaths rising an average 13% through June of 2020 over the last year. It is worrisome that if the trend continues for the rest of the year, it will be the sharpest increase in annual drug deaths since 2016, when synthetic opioids, including fentanyl, first made significant inroads into the countries' illicit drug supply. However, multiple drugs are involved in deaths and none of the categories are mutually exclusive.



Drug-related deaths increased extensively in Delaware, Washington, Wisconsin, Colorado, Rhode Island, Iowa, Vermont, Louisiana, California, Minnesota, Texas, New Jersey, Illinois and Florida. In addition, the data shows that monthly overdoses have grown dramatically during the pandemic as shown in Fig. 4. The number of sus-

pected overdoses in the US, both fatal and non-fatal, was 18% higher in March 2020 than it was in March 2019 according to the Overdose Detection Mapping Application Program (ODMAP). However, this continued to escalate with overdoses increasing to 29% in April and 42% in May as shown in Fig. 4 (8).

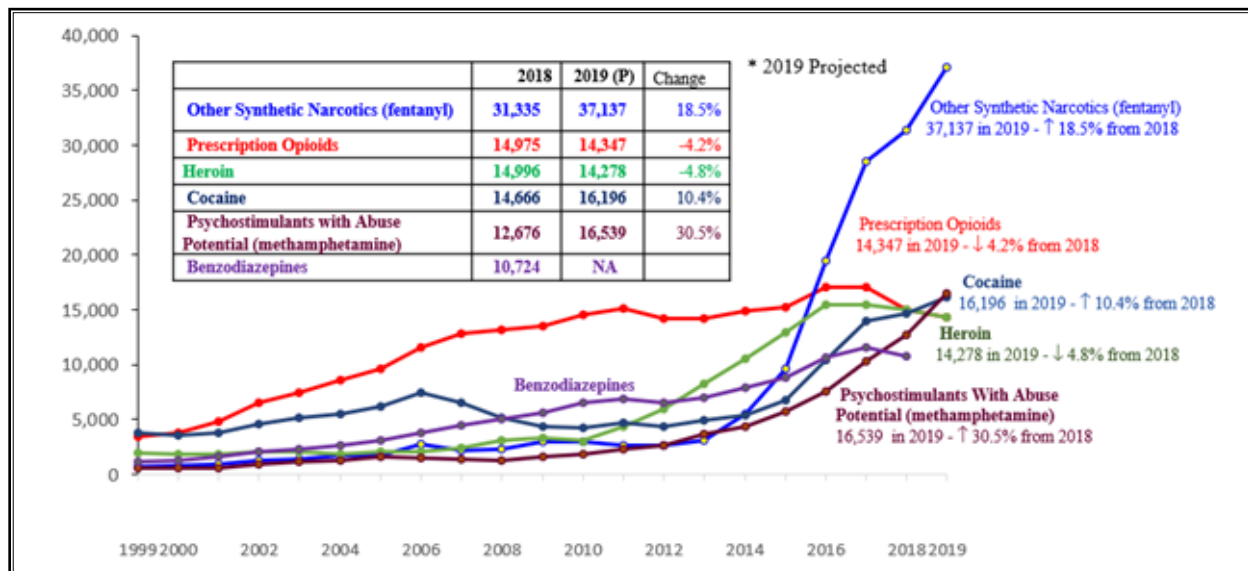


Fig. 3. Number of opioid overdose deaths by category, 1999 to 2019.

Source(s):

For 1999-2018 – National Institute on Drug Abuse. Overdose death rates. May 7, 2020 <https://www.drugabuse.gov/relatedtopics/trends-statistics/overdose-death-rates> (5,6).

For 2019 - Ahmad FB, Rossen LM, Sutton P. Provisional drug overdose death counts. National Center for Health Statistics. 2020. (7) <https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm>

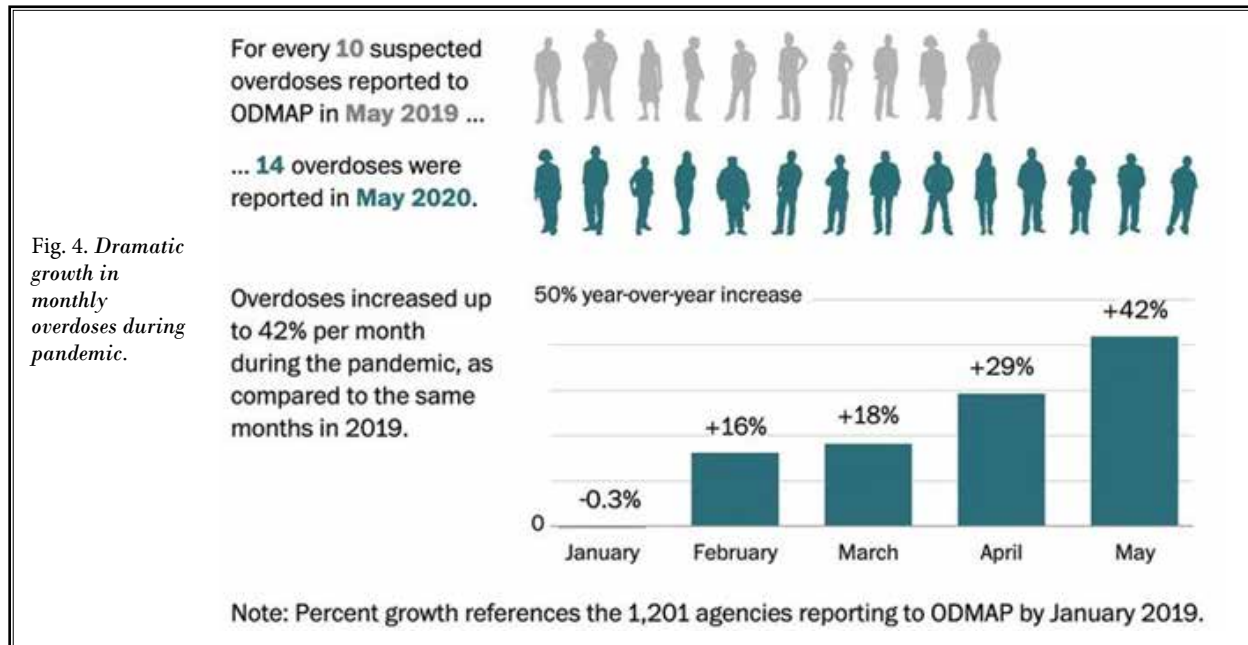


Fig. 4. Dramatic growth in monthly overdoses during pandemic.

A burnout survey conducted by interventional pain physicians showed the devastating effects of COVID-19 (14), with 98% of practicing physicians being affected, 52% with new burnout secondary to COVID-19, and 66% reporting a negative outlook. The survey also showed that risk factors were not only the COVID-19 scare, but also the economic impact, with coding and billing issues with 67% attributing it to in-house billing and 73% to electronic medical records (EMRs) (Fig. 5). As reopening started in multiple phases, these developments led to the formation of multiple task forces and the publication of risk stratification for mitigation and reopening and for elective procedures as shown in Tables 1 and 2 and Fig. 6 (15,16). Changes in education and communication (17) and development of safe modalities or techniques with increased surveillance on infection and avoidance of immunosuppressive drugs (18-20).

During the lockdown, the American Society of Interventional Pain Physicians (ASIPP) worked tirelessly to keep members and the public informed, and to assist economically and educationally with advocacy for interventional pain management (www.asipp.org). A majority of practices were affected substantially in all sectors, exacerbated by reopening in various phases followed by resurgence causing significant loss of practice volumes for almost 3 months, then, with a slow start, and returning to near normal on an extremely slow ba-

sis, volumes recently have seen flattening or declining, except for a few procedures, and are expected to decline even further (21-30). Even more alarming is that, normalcy is NOT expected in the near future (31). It is also worrisome that this may lead to an increased abuse of opioids and deaths (21-30,32-37), despite evidence for effectiveness of interventional techniques, based on discordant opinions (18-20,28,36-47).

All health care professionals have faced multiple issues such as elective surgeries, along with interventional techniques, and have opened with warnings and occurrences of peaks and valleys and resurgence. The health care workforce and patients continue to be concerned with the consequences of long exposure in health care settings, specifically undergoing interventional techniques or elective surgeries (46-48). Consequently, extensive testing has been proposed (49).

Pain Physician, the official journal of ASIPP, has launched a special issue covering COVID-19 issues. The publications range from understanding the pathophysiological mechanisms, epidemiology, implications on interventional pain practices, safety and effectiveness of various modalities of drug therapy, telemedicine, along with the effect on interventional pain management practices, and, finally, the technological impact of COVID-19 on the future of education and health care delivery and multiple guidelines (14-18,20,49-55).

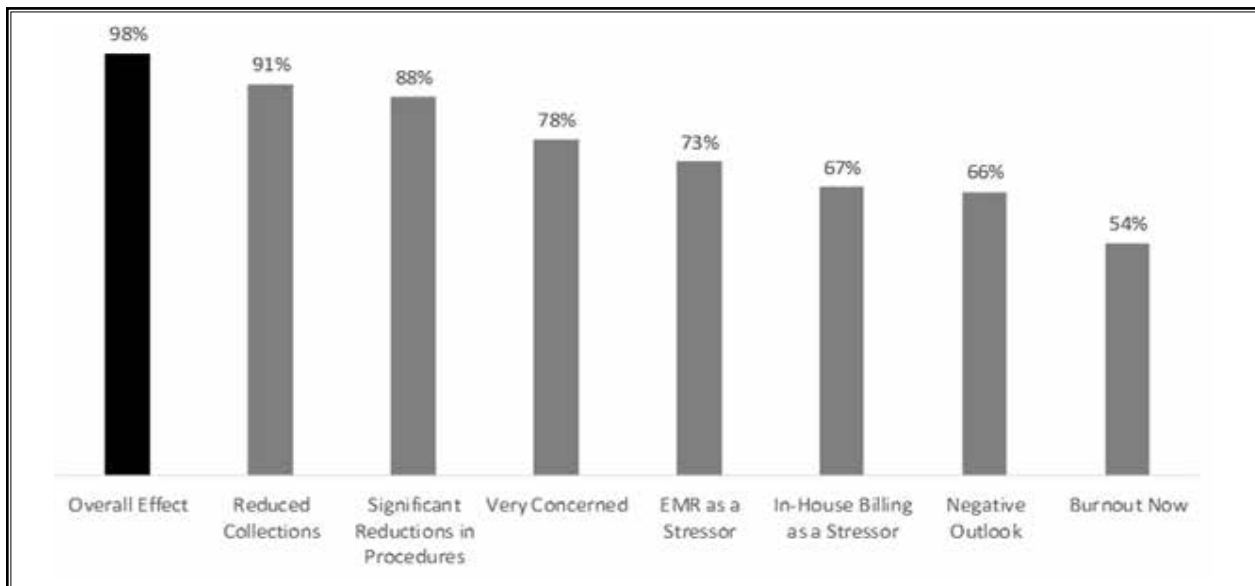


Fig. 5. Results of burnout survey illustrating multiple adverse effects of COVID-19 pandemic on IPM practices.
 Source: Jha S, et al. The effect of COVID-19 on interventional pain management practices: A physician burnout survey. Pain Physician 2020; 23:S271-S282 (14).

Table 1. COVID-ARMS risk stratification of patients presenting for interventional pain procedures for decreasing morbidity of COVID-19 (points appear in brackets).

If Patient Residence status is Nursing Home or Assisted Living Facility or Incarceration during the past 30 days, consider as HIGH-RISK Patient. If not, follow below table for risk stratification.

Risk Factor	Low Risk	Moderate Risk	High Risk
Age (years)	45-64 years [1]	65-74 years [2]	≥ 75 years [3]
Pulmonary	None [0]	Mild intermittent asthma [2]	Chronic lung condition, i.e., moderate to severe asthma, COPD [3]
Cardiovascular	None [0]	HTN or CAD [2]	HTN + CAD HTN + CHF HTN + CAD + CHF CHF alone [3]
Obesity	BMI 24.9-29.9 [1]	BMI 30.0-39.9 [2]	BMI ≥ 40 [3]
Diabetes (A1C) BGM (mg/dl) (Consider finger-stick BGM if A1C is not available)	5.8-6.49 or 100-120 mg/dl [1]	6.5-8.49 or 120-160 mg/dl [2]	≥ 8.5 or > 160 mg/dl [3]
Renal	None [0]	Acute or chronic renal insufficiency [2]	Chronic renal insufficiency on dialysis [3]
Hepatic	None [0]	Chronic hepatitis [2]	Cirrhosis [3]
Immuno-compromised state	None [0]	1 stable condition [2]	The presence of <u>ANY</u> : Cancer (active treatment) Bone marrow/organ transplantation Immune deficiencies Poorly controlled HIV/AIDS Chronic steroid use [3]

Patients who score ≤ 7 points may be considered low risk, those scoring 8-14 points are moderate risk, and high-risk patients are those who score ≥ 15 points.

BGM = blood glucose meter; BMI = body mass index; CAD = coronary artery disease; CHF = congestive heart failure; COPD = chronic obstructive pulmonary disease; HTN = hypertension

Adapted with permission: Shah S, Diwan S, Soin A, et al. Evidence-informed risk mitigation and stratification during COVID-19 for return to interventional pain practice: American Society of Interventional Pain Physicians (ASIPP) guidelines. *Pain Physician* 2020; 23: S161-S182 (15).

Some of the highlights of the manuscripts are as follows:

- An overview of stem cell therapy for acute respiratory distress syndrome (ARDS) with focus on COVID-19 by Rachel Kaye (50), a medical student from the Medical University of South Carolina. This provides an excellent review of the subject with descriptions of randomized double-blind clinical trials and other types of studies.
- Atluri et al (51) described safety and effectiveness of intravascular mesenchymal stem cells (MSCs) to treat organ failure and possible application in CO-

VID-19 complications. This comprehensive review provided a review of multiple studies and reached the conclusion that MSC therapy seems to be promising to treat multiorgan failure from COVID-19 with a plea for more studies needed to assess both safety and effectiveness.

- de Barros et al (52) provided a narrative review of the potential roles of chloroquine and hydroxychloroquine.
- The other publications include a physician burnout survey and implications for interventional pain practices by Jha et al (14) and Gharaei and Diwan (53).

Table 2. ASIPP guidance for triaging pain interventions with examples

	Tier	Description	Locations	Examples	Interventions	Timing
1	Emergent	Intermediate acuity Unable to perform essential ADLs Progressive pain despite conservative treatment Possible future morbidity Exacerbation of underlying medical condition or may proceed to surgery if not treated with pain intervention Psychosocial implications Escalating opioid doses Risk of chemical coping	Office-based Outpatient ASC Inpatient	Failed noninterventional management New onset or exacerbation of CRPS. Acute exacerbation of radiculopathy Degenerative or neurological disease with walking difficulty Degenerative or neurological disease with painful use of upper extremities Intervention performed to provide pain relief to allow conservative management such as physical therapy Thoracic nerve blocks for rib fractures PDPH	Lumbar sympathetic block Epidural steroids Epidural catheter in cancer pain Blood patch	Perform procedure after reasonable efforts to postpone with alternatives. Physician's discretion.
2	Urgent	Severe acuity Unable to perform most ADLs due to severe physical incapacitation Rapidly progressive pain Rapidly progressive decline in function Repeated ED visits due to pain High probability of future morbidity if procedure not performed Exacerbation of underlying medical condition or may proceed to surgery if not treated with interventional pain Development of an unacceptable medical condition unless the procedure is performed Pharmacologically and otherwise unmanageable pain Substantial risk of psychosocial harm Substantial risk of opioid misuse, abuse and chemical coping	Office-based Outpatient ASC Inpatient	Impending severe drug withdrawal Disabling CRPS Degenerative or neurological disease with severe walking inability Degenerative or neurological disease with severe inability to use upper extremities Alternative to pending spine surgery, if appropriate	Pump refills Lumbar sympathetic block Stellate ganglion block Epidural steroid for acute, severe radiculopathy	Do not postpone

Table 2 (cont.). ASIPP guidance for triaging pain interventions with examples

Tier	Description	Locations	Examples	Interventions	Timing
3	Elective Low acuity Healthy patient Stable Able to perform ADL No meaningful functional limitation Low risk to patient Low-risk options available (home physical therapy, pharmacological therapy)	Office-based Outpatient ASC Inpatient	Any pain condition that is stable and can be managed with alternatives	Any procedure	Postpone procedure until elective surgery ban lifted

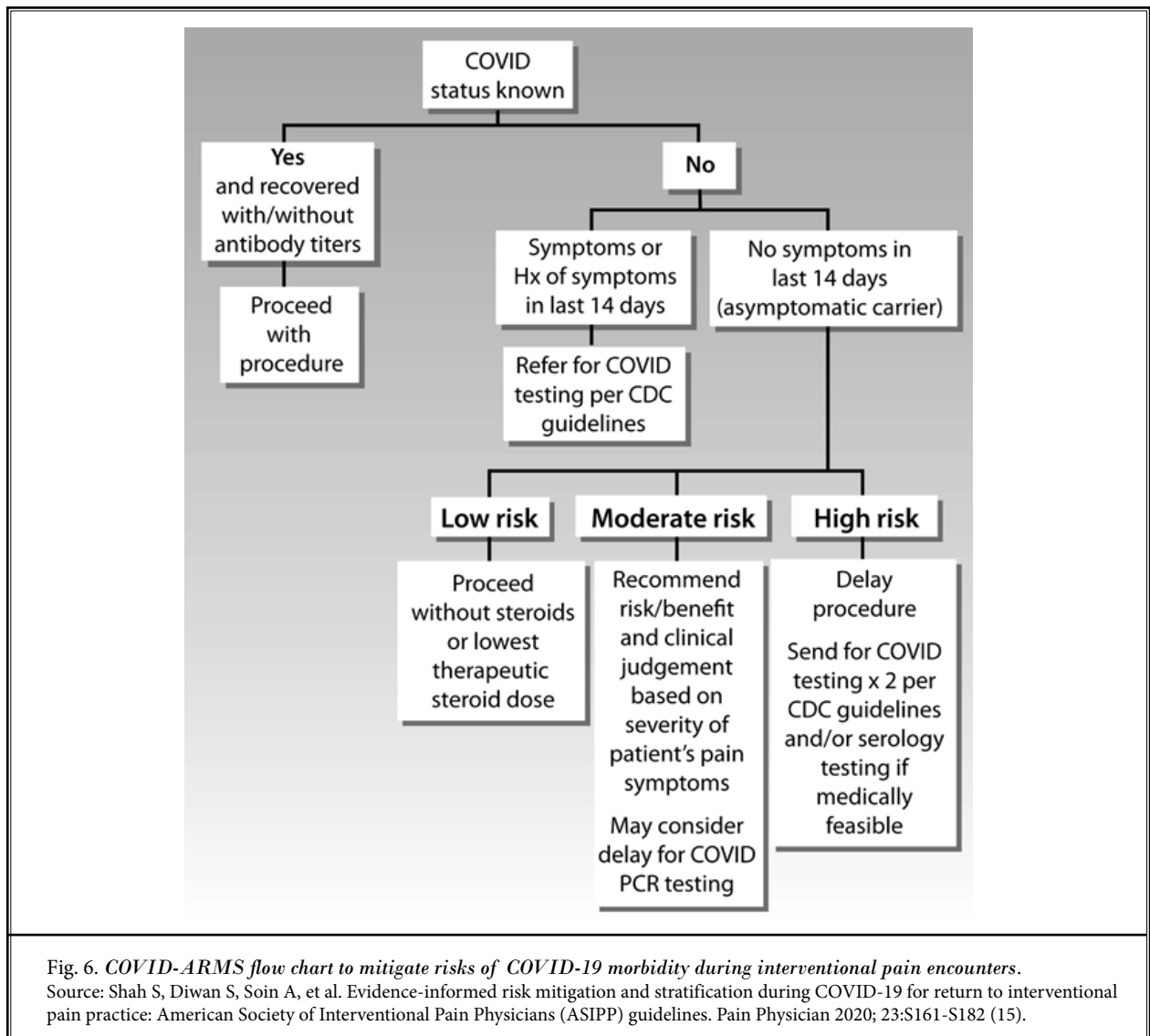


Fig. 6. COVID-ARMS flow chart to mitigate risks of COVID-19 morbidity during interventional pain encounters. Source: Shah S, Diwan S, Sooin A, et al. Evidence-informed risk mitigation and stratification during COVID-19 for return to interventional pain practice: American Society of Interventional Pain Physicians (ASIPP) guidelines. Pain Physician 2020; 23:S161-S182 (15).

- On similar lines, Soin et al (54) provided an overview of Ohio's response to COVID-19 and its impact on interventional pain management practices.
- Wahezi et al (55) provided "Telemedicine during COVID and beyond: A practical guide and best practices multidisciplinary approach for the musculoskeletal physical examination." This is one of the first manuscripts describing a long distance physical examination without actually touching the patient. As telemedicine grows into the future, these types of manuscripts will be assets for the future.
- To cope with evidence and avoid immunosuppression and steroids, a manuscript by Knezevic et al (20) showed a lack of superiority of steroids and local anesthetic alone as an alternate treatment.
- Along similar lines, "steroid distancing", a term borrowed from the orthopedic literature, for interventional pain management provides comprehensive descriptions, evidence, and guidance (18).
- The future of interventional pain management depends on education. The technological impact of COVID-19 on the future of education and health care delivery was provided by Shah et al (17) in a comprehensive manuscript. This manuscript touches on various aspects of the future of education. Finally, the most important manuscripts in this special issue describe 2 guidances provided by ASIPP with "Evidence-informed risk mitigation and stratification during COVID-19 for return to interventional pain practice: American Society of Interventional Pain Physicians (ASIPP) guidelines" by Shah et al (15) and "Triaging interventional pain procedures during COVID-19 or related elective surgery restrictions: Evidence-informed guidance from the American Society of Interventional Pain Physicians (ASIPP) by Gharibo et al (16).

There are also other manuscripts being published in this issue, along with multiple letters to the editor.

This issue is extensive and enjoyable to be cher-

ished into the future. We understand that current public health efforts will lead to a significant economic decline; however, if you are willing to put a price tag on human life, Yakusheva et al in a manuscript entitled, "The cure is not worse than the disease: A humanitarian perspective" (56), draws upon economic estimates of mortality induced by government regulation, to compare lives saved by the current public health approach with potential downstream collateral loss of lives from the economic downturn. Based on the best current evidence, they estimated that COVID-19-mitigating public health measures will save between 900,000 and 2,700,000 lives in the US (57); however, the economic downturn from shelter-in-place measures and other restrictions on economic activity could create a downstream collateral loss of 50,400 to 323,000 lives with 8% to 14% economic reduction. They also showed startling numbers with unmitigated deaths to 2.9 million in the United States. The estimates increased 0.7 million in a matter of weeks from 2.2 million to 2.9 million (57,58). The current death toll exceeds 130,000 with the daily death toll declining from about 2,500 during mid-April to about 600 daily deaths currently (59), likely attributable to strict shelter-in-place orders, social distancing, and limitations on economic activity. However, resurgence has become bothersome, and in some states during this time, the progress has been reverted. Overall, the mitigated death toll appears to be around 200,000. The humanitarian costs of COVID-19 measures have resulted in the deepest recession since at least 2009 and perhaps since World War II (60,61).

As we go forward we can expect turbulences and ups and downs to be gradually followed by an increasingly stabilized atmosphere with the development of an effective vaccine and treatment modalities. We are closer today than ever before. As we weather this storm together, *Pain Physician*, will continue to publish timely and scholarly manuscripts. Meanwhile, ASIPP will continue to provide appropriate information on a regular basis.

REFERENCES

1. Cox C, Kamal R, McDermott D. How have healthcare utilization and spending changed so far during the coronavirus pandemic? *Health System Tracker*, May 29, 2020. Accessed 7/14/2020
<https://www.healthsystemtracker.org/chart-collection/how-have-healthcare-utilization-and-spending-changed-so-far-during-the-coronavirus-pandemic/#item-start>
2. IQVIA. Monitoring the impact of COVID-19 on the pharmaceutical market. June 1, 2020. Accessed 7/20/2020.
<https://www.iqvia.com/locations/united-states/events/2020/07/monitoring-the-impact-of-covid-19-on-the-pharmaceutical-market-july-7>
3. Bernstein S. New US health crisis looms as patients without COVID-19 delay care. Reuters, July 13, 2020. Accessed 7/20/2020
<https://www.reuters.com/article/us-health-coronavirus-usa-care-idUSKCN24E143>
4. Katz J, Goodnough A, Sanger-Katz M. In shadow of pandemic, U.S. drug overdose deaths resurge to record. The New York Times, July 15, 2020. Accessed 7/21/2020
<https://www.nytimes.com/interactive/2020/07/15/upshot/drug-overdose-deaths.html>
5. Wilson N, Kariisa M, Seth P, Smith H 4th, Davis NL. Drug and opioid-involved overdose deaths - United States, 2017-2018. *MMWR Morb Mortal Wkly Rep*. 2020;69:290-297.
6. NIDA. Overdose Death Rates. National Institute on Drug Abuse website. Accessed 7/10/2020.
<https://www.drugabuse.gov/drug-topics/trends-statistics/overdose-death-rates>
7. Ahmad FB, Rossen LM, Sutton P. Provisional drug overdose death counts. National Center for Health Statistics. 2020. Accessed 7/21/2020
<https://www.cdc.gov/nchs/nvss/vsrr/drug-overdose-data.htm>
8. Levitz E. U.S. drug overdose deaths hit record high in 2019. *Intelligencer*, July 15, 2020. Accessed 7/20/2020
<https://nymag.com/intelligencer/2020/07/drug-overdose-deaths-opioids-2019-2020-coronavirus.html>
9. American Medical Association. Issue brief: Reports of increases in opioid-related overdose and other concerns during COVID pandemic. Updated June 30, 2020. Accessed 7/10/2020.
<https://www.ama-assn.org/system/files/2020-07/issue-brief-increases-in-opioid-related-overdose.pdf>
10. American Medical Association. Issue brief: Reducing barriers to vital pain medication during the COVID-19 pandemic. Accessed 7/10/2020
<https://www.ama-assn.org/system/files/2020-05/issue-brief-reducing-barriers-vital-pain-medication.pdf>
11. Dasgupta N, Beletsky L, Ciccarone D. Opioid crisis: No easy fix to its social and economic determinants. *Am J Public Health* 2018; 108:182-186.
12. Grinspoon P. A tale of two epidemics: When COVID-19 and opioid addiction collide. Harvard Health Publishing, April 20, 2020. Accessed 7/10/2020.
<https://www.health.harvard.edu/blog/a-tale-of-two-epidemics-when-covid-19-and-opioid-addiction-collide-2020042019569>
13. Volkow N. COVID-19: Potential implications for individuals with substance use disorders. National Institute on Drug Abuse, April 6, 2020. Accessed 7/10/2020.
<https://www.drugabuse.gov/about-nida/noras-blog/2020/04/covid-19-potential-implications-individuals-substance-use-disorders>
14. Jha S, Shah S, Calderon MD, Sooin A, Manchikanti L. The effect of COVID-19 on interventional pain management practices: A physician burnout survey. *Pain Physician* 2020; 23:S271-S282.
15. Shah S, Diwan S, Sooin A, et al. Evidence-informed risk mitigation and stratification during COVID-19 for return to interventional pain practice: American Society of Interventional Pain Physicians (ASIPP) guidelines. *Pain Physician* 2020; 23:S161-S182.
16. Gharibo C, Sharma A, Sooin A, et al. Triaging interventional pain procedures during COVID-19 or related elective surgery restrictions: Evidence-informed guidance from the American Society of Interventional Pain Physicians (ASIPP). *Pain Physician* 2020; 23:S183-S204.
17. Shah SS, Diwan S, Kohan L, et al. The technological impact of COVID-19 on the future of education and health care delivery. *Pain Physician* 2020; 23:S367-S380.
18. Manchikanti L, Kosanovic R, Vanaparthi R, et al. Steroid distancing in interventional pain management during COVID-19 and beyond: Safe, effective, and practical approach. *Pain Physician* 2020; 23:S319-S352.
19. Manchikanti L, Knezevic NN, Parr A, Kaye AD, Sanapati M, Hirsch JA. Does epidural bupivacaine with or without steroids provide long-term relief? A systematic review and meta-analysis. *Curr Pain Headache Rep* 2020; 24:26.
20. Knezevic NN, Manchikanti L, Vanaparthi R, et al. Lack of superiority of epidural injections with lidocaine with steroids compared to without steroids in spinal pain: A systematic review and meta-analysis. *Pain Physician* 2020; 23:S239-S270.
21. Manchikanti L, Sanapati MR, Pampati V, Boswell MV, Kaye AD, Hirsch JA. Update on reversal and decline of growth of utilization of interventional techniques in managing chronic pain in the Medicare population from 2000 to 2018. *Pain Physician* 2019; 22:521-536.
22. Manchikanti L, Sanapati MR, Pampati V, et al. Update of utilization patterns of facet joint interventions in managing spinal pain from 2000 to 2018 in the US fee-for-service Medicare population. *Pain Physician* 2020; 23:E133-E149.
23. Manchikanti L, Sooin A, Mann DP, et al. Utilization patterns of facet joint interventions in managing spinal pain: A retrospective cohort study in the US fee-for-service Medicare population. *Curr Pain Headache Rep* 2019; 23:73.
24. Manchikanti L, Sanapati MR, Sooin A, et al. An updated analysis of utilization of epidural procedures in managing chronic pain in the Medicare population from 2000 to 2018. *Pain Physician* 2020; 23:111-126.
25. Manchikanti L, Sooin A, Mann DP, Bakshi S, Pampati V, Hirsch JA. Comparative analysis of utilization of epidural procedures in managing chronic pain in the Medicare population: Pre and post Affordable Care Act. *Spine (Phila Pa 1976)* 2019; 44:220-232.
26. Manchikanti L, Sanapati J, Pampati V, Kaye AD, Hirsch JA. Utilization of vertebral augmentation procedures in the United States: A comparative analysis in medicare fee-for-service

- population pre- and post-2009 trials. *Curr Pain Headache Rep* 2020; 24:22.
27. Manchikanti L, Pampati V, Benyamin RM, Hirsch JA. Declining utilization of percutaneous epidural adhesiolysis in Medicare population: Evidence-based or over-regulated? *IPM Reports* 2018; 2:9-18.
 28. Manchikanti L, Kaye AD, Soin A, et al. Comprehensive evidence-based guidelines for facet joint interventions in the management of chronic spinal pain: American Society of Interventional Pain Physicians (ASIPP) guidelines. *Pain Physician* 2020; 23:S1-S27.
 29. Navani A, Manchikanti L, Albers SL, et al. Responsible, safe, and effective use of biologics in the management of low back pain: American Society of Interventional Pain Physicians (ASIPP) guidelines. *Pain Physician* 2019; 22:S1-S74.
 30. Manchikanti L, Centeno CJ, Atluri S, et al. Bone marrow concentrate (BMC) therapy in musculoskeletal disorders: Evidence-based policy position statement of American Society of Interventional Pain Physicians (ASIPP). *Pain Physician* 2020; 23:E85-E131.
 31. CDC Guidelines for Opening up America again. Accessed 7/21/2020. <https://www.whitehouse.gov/openingamerica/>
 32. Manchikanti L, Kaye AM, Knezevic NN, et al. Responsible, safe, and effective prescription of opioids for chronic non-cancer pain: American Society of Interventional Pain Physicians (ASIPP) guidelines. *Pain Physician* 2017; 20: S3-S92.
 33. Chakravarthy K, Manchikanti L, Kaye AD, Christo PJ. Reframing the role of neuromodulation therapy in the chronic pain treatment paradigm. *Pain Physician* 2018; 21:507-513.
 34. Manchikanti L, Singh V, Benyamin RM, Kaye AD, Pampati V, Hirsch JA. Reframing Medicare physician payment policy for 2019: A look at proposed policy. *Pain Physician* 2018; 21:415-432.
 35. Manchikanti L, Sanapati J, Benyamin RM, Atluri S, Kaye AD, Hirsch JA. Reframing the prevention strategies of the opioid crisis: Focusing on prescription opioids, fentanyl, and heroin epidemic. *Pain Physician* 2018; 21:309-326.
 36. Sanapati J, Manchikanti L, Atluri S, et al. Do regenerative medicine therapies provide long-term relief in chronic low back pain: A systematic review and metaanalysis. *Pain Physician* 2018; 21:515-540.
 37. Manchikanti L, Abdi S, Atluri S, et al. An update of comprehensive evidence-based guidelines for interventional techniques of chronic spinal pain: Part II: Guidance and recommendations. *Pain Physician* 2013; 16:S49-S283.
 38. Lee JH, Shin KS, Park SJ, et al. Comparison of clinical efficacy between transforaminal and interlaminar epidural injections in lumbosacral disc herniation: A systematic review and meta-analysis. *Pain Physician* 2018; 21:433-448.
 39. Lee JH, Kim DH, Kim DH, et al. Comparison of clinical efficacy of epidural injection with or without steroid in lumbosacral disc herniation: A systematic review and meta-analysis. *Pain Physician* 2018; 21:449-468.
 40. Manchikanti L, Knezevic NN, Sanapati SP, Sanapati MR, Kaye AD, Hirsch JA. Is percutaneous adhesiolysis effective in managing chronic low back and lower extremity pain in post-surgery syndrome: A systematic review and meta-analysis. *Curr Pain Headache Rep* 2020; 24:30.
 41. Manchikanti L, Soin A, Boswell MV, Kaye AD, Sanapati M, Hirsch JA. Effectiveness of percutaneous adhesiolysis in post lumbar surgery syndrome: A systematic analysis of findings of systematic reviews. *Pain Physician* 2019; 22:307-322.
 42. Manchikanti L, Knezevic NN, Sanapati MR, Boswell MV, Kaye AD, Hirsch JA. Effectiveness of percutaneous adhesiolysis in managing chronic central lumbar spinal stenosis: A systematic review and meta-analysis. *Pain Physician* 2019; 22:E523-E550.
 43. Manchikanti L, Knezevic NN, Boswell MV, Kaye AD, Hirsch JA. Epidural injections for lumbar radiculopathy and spinal stenosis: A comparative systematic review and meta-analysis. *Pain Physician* 2016; E365-E410.
 44. Manchikanti L, Benyamin RM, Falco FJ, Kaye AD, Hirsch JA. Do epidural injections provide short- and long-term relief for lumbar disc herniation? A systematic review. *Clin Orthop Relat Res* 2015; 473:1940-1956.
 45. Manchikanti L, Nampiaparampil DE, Manchikanti KN, et al. Comparison of the efficacy of saline, local anesthetics, and steroids in epidural and facet joint injections for the management of spinal pain: A systematic review of randomized controlled trials. *Surg Neurol Int* 2015; 6:S194-S235.
 46. Johns Hopkins Medicine. Coronavirus (COVID-19) Information and Updates. Accessed 6/30/2020 <https://www.hopkinsmedicine.org/coronavirus>
 47. Martin-Hidalgo Birnbaum M. Texas a COVID hotspot as state reopens. WebMD, June 17, 2020. Accessed 6/30/2020 <https://www.webmd.com/lung/news/20200617/texas-a-covid-hotspot-as-state-reopens>
 48. Levin J. Dissecting Florida's COVID-19 resurgence in four charts. Bloomberg, June 11, 2020. Accessed 6/30/2020 <https://www.bloomberg.com/news/articles/2020-06-11/dissecting-florida-s-covid-19-resurgence-in-four-charts> Accessed 6/30/2020
 49. Mahajan A, Manchikanti L. Value and validity of coronavirus antibody testing. *Pain Physician* 2020; 23:S381-S390.
 50. Kaye R. Overview of stem cell therapy for acute respiratory distress syndrome with focus on COVID 19. *Pain Physician* 2020; 23:S423-S434.
 51. Atluri S, Manocha V, Boddu N, Bhati S, Syed Z, Diwan S. Safety and effectiveness of intravascular mesenchymal stem cells to treat organ failure and possible application in covid-19 complications. *Pain Physician* 2020; 23:S391-S424.
 52. de Barros C, de Faria Alemida CA, Pereria BP, et al. COVID-19 Pandemic - A narrative review of the potential roles of Chloroquine and Hydroxychloroquine. *Pain Physician* 2020; 23:S353-S366.
 53. Gharaei H, Diwan S. COVID-19 Pandemic: Implications on interventional pain practice—A narrative review. *Pain Physician* 2020; 23:S311-318.
 54. Soin A, Vuppala S, Surfield G, et al. Ohio response to COVID-19 and its impact on interventional pain management practices. *Pain Physician* 2020; 23:S441-S448.
 55. Wahezi S, Duarte RA, Yerra S, et al. Telemedicine during COVID and beyond: A practical guide and best practices multidisciplinary approach for the musculoskeletal physical exam. *Pain Physician* 2020; 23:S205-S238.
 56. Yakusheva O, van den Broek-Altenburg E, Brekke G, Atherly A. The cure is not worse than the disease - A humanitarian perspective. SSRN, July 10, 2020. Accessed 7/14/2020

- https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3638575
57. Walker PG, Whittake C, Watson O, Baguelin M, Ainslie KEC, Bhatia S. Report 12 - The global impact of COVID-19 and strategies for mitigation and suppression. *Imperial College London*, March 26, 2020.
<https://www.imperial.ac.uk/mrc-global-infectious-disease-analysis/covid-19/report-12-global-impact-covid-19/>. Accessed 7/14/2020
58. Ferguson NM, Laydon D, Nedjati-Gilani G, et al. Report 9: Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand. *Imperial College COVID-19 Response Team*, March 16, 2020. Accessed 7/14/2020
<https://www.imperial.ac.uk/media/imperial-college/medicine/sph/ide/gida-fellowships/Imperial-College-COVID19-NPI-modelling-16-03-2020.pdf>.
59. Coronavirus disease (COVID-2019) situation reports: Situation Report 161. *World Health Organization*, 2020. Accessed 7/14/2020
<https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>.
60. Kennedy S, Jamrisko M. V, L or 'Nike Swoosh'? Economists debate shape of global recovery. *Bloomberg*, 2020. [cited 2020 May 29]. Accessed 7/14/2020
<https://www.bloomberg.com/news/articles/2020-04-02/economists-debate-shape-of-a-global-recovery-after-coronavirus>.
61. Kochhar R. Unemployment rose higher in three months of COVID-19 than it did in two years of the Great Recession. *Pew Research Center*, June 11, 2020. Accessed 7/14/2020
<https://www.pewresearch.org/fact-tank/2020/06/11/unemployment-rose-higher-in-three-months-of-covid-19-than-it-did-in-two-years-of-the-great-recession/>.

