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Target audience	This activity is designed to meet the educational needs of physicians, PAs, nurses, nurse practitioners and other HCPs who have an interest in EBM.
Learning objectives	• Examine the management of chronic low back pain. • Review pharmacological evidence for bisphosphonate therapy for women with osteoporosis and first do no harm applied to persons with hypertension. • Discuss studies regarding the role of implantable loop recorders for atrial fibrillation and stroke, Omicron testing, and platelet-rich plasma for treatment options in knee, ankle or Achilles tendinopathy.

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Management of chronic low back pain

Source of review

This article is an expansion of a JAMA article I was asked to write for their "Evidence to Practice" series, published in 12/21.[1] It was based on our Optimal Care model of care for chronic low back pain (CLBP). Over the past several years, multiple randomized controlled trials (RCTs) and meta-analyses have examined important therapeutic options in the management of CLBP. These data have been supplemented by two recent systematic reviews examining both pharmacologic and non-pharmacologic treatments for CLBP.

Background

Over 10% of the population has CLBP, defined as back pain lasting more than 12 weeks. It is the sixth most costly condition in the U.S. with an annual expenditure of over $90 billion. Many interventions provided to patients lack Level I or II evidence of benefit and rely instead on observational studies and consensus recommendations. Moreover, for many patients the care model provides invasive and pharmacotherapeutic interventions but does not actively engage them in a coordinated behavioral and rehabilitative model shown to improve long term outcomes.

Summary of findings: Therapies found to produce clinically meaningful benefits

- **Noninvasive, nonpharmaceutical interventions:** A 2017 review detailed 114 studies of noninvasive treatments for acute and chronic LBP. Small improvements were seen with mindfulness-based stress reduction and chiropractic manipulation. Moderate improvements were seen with core strengthening exercises such as Pilates, Tai Chi, and yoga, as well as with acupuncture. Cognitive behavioral therapy and patient education around pain management skills have both shown clinically meaningful reductions in pain intensity and improved PROMIS scales; validated measures of physical, mental, and social health. Combining these exercise regimens and behavioral approaches through a comprehensive multi-disciplinary rehabilitation model has also shown clinically significant improvements, including lower long-term pain intensity, improved function, and a greater likelihood of returning to work compared with non-multidisciplinary rehabilitation.
- **Specific pharmacotherapies:** NSAID's have consistently shown small-to-modest benefit in CLBP, with smaller benefits in chronic radicular pain. The SNRI antidepressant duloxetine has shown small improvements in pain and function in CLBP. No other medications have consistently shown benefit in CLBP.
- **Lumbar decompression and fusion:** The SPORT (Spine Pain Outcomes Research Trial) was a large randomized controlled trial (RCT) of non-surgical care versus lumbar decompression surgery for lumbar spinal stenosis, and decompression with or without fusion for degenerative spondylolisthesis. Both the spinal stenosis and spondylolisthesis arms of the trial showed significant clinical improvements in pain, disability, and function for up to four years following surgery, at which point surgical improvements began to decline towards the non-surgical group. By year four, the improvements were no longer clinically significant.

Treatments lacking a significant evidence of support

- Apart from the therapies above, many pharmacological and invasive procedures lack sufficient evidence of effectiveness (summarized in Table 1). Gabapentinoids and opioids deserve focused attention due to their high frequency of use, lack of evidence of benefit, and high rate of adverse effects. Between 2000 and 2015, gabapentinoid use increased 15-fold in the treatment of osteoarthritis, including CLBP. Pregabalin and gabapentin have now been well studied with most data suggesting no benefit and a highly significant burden of cognitive side effects. The most robust study was a one-year RCT of pregabalin vs. placebo in acute and chronic sciatica in 209 patients. Although pregabalin did not improve pain or disability, 57% of patients had neurological side effects, including dizziness in 40%, which increases fall risk. Despite the widespread use and known serious harms of opioid treatment, there is a striking absence of data showing any benefit to opioid use in CLBP. A recent systematic review of opioid therapy for CLBP identified 14 studies that enrolled a total of 6,457 participants and compared opioid therapy to placebo or non-opioid analgesics. The duration of the longest trial was 12 weeks. Overall, compared to placebo or non-opioid analgesics, there was a clinically insignificant 0.9 decrease in the 10-point visual-analog scale (VAS) score.
- Other areas where evidence of benefit is lacking include epidural steroid injection (ESI), vertebroplasty, and spinal cord stimulators. With respect to ESI, the Agency for Healthcare Research and Quality commissioned a technology assessment in 2015 examining the totality of data on the use of ESI in the management of low back pain. ESI was not found to be of benefit for the management of CLBP. The only statistically significant effect

was in short term (5–14 day) pain relief of radicular pain, but this did not meet the threshold of a clinically important benefit. ESIs were not shown to be of benefit in CLBP, spinal stenosis, non-radicular back pain, or chronic radicular back pain, and did not reduce the likelihood of undergoing surgery.

- An additional issue is the overuse of lumbar fusion when routinely added to decompression among patients with degenerative spondylolisthesis at one or two adjacent spinal levels in the absence of significant instability. A meta-analysis published in 2020 examined six RCTs including 650 patients that compared these two approaches. There were no statistically significant differences in any outcome, including VAS score for LBP or leg pain, Oswestry Disability Index (a validated instrument to quantify disability for low back pain), or multiple quality-of-life indices. A more recent randomized trial of microdecompression versus decompression plus fusion in 570 patients again showed no statistically significant benefit to fusion in this population of patients. These studies are of importance as the rate of lumbar fusion in the Medicare population increased 15-fold between 2002 and 2007 and continues to rise. Every year 1.2 million lumbar fusions are performed at an average commercial health plan cost of $60,000-$110,000.
- **Limitations on the evidence:** Most studies have been of short-to-intermediate duration. Many studies are subject to bias by small sample sizes, methodological limitations, industry funding, and study heterogeneity. Additionally, many comparative efficacy interventions did not use a placebo or sham study design, rendering the results difficult to interpret due to the large placebo response seen in studies of chronic pain.

Conclusions

When examined in total, evidence suggests that many of the therapies commonly used to treat CLBP lack a strong evidence-base of support. The routine use of these approaches should be questioned. This is most relevant when the intervention is associated with significant harm, such as the use of gabapentinoids and opioids in CLBP, and the routine addition of fusion to lumbar decompression in degenerative spondylolisthesis.

Treatment modalities may be considered "passive", such as ESI and pharmacotherapies, versus "active," such as CBT, core strengthening exercise programs, and multi-disciplinary rehabilitation. Overall, the evidence supports active modalities, yet the majority of patients with CLBP have not had a robust trial of these interventions to treat their pain. This underscores the need to improve patient engagement and education, along with shared decision-making, to maximize clinical improvements. Patients need to be educated that these interventions can be successful, but often require three to six months to be maximally effective. When patients understand the real-world outcomes associated with active therapies compared to invasive management, they choose active therapies more frequently.

Importantly, physician reimbursement and long-term patient outcomes are often not aligned. Many of the highly reimbursed modalities such as ESI, lumbar fusion, spinal cord stimulator implantation, and vertebroplasty lack robust evidence of improved outcomes. In contrast, many of the active interventions which have proven to be effective, safe, and inexpensive—such as multi-disciplinary rehabilitation, CBT, yoga, Pilates, along with others— may have out-of-pocket costs that deter utilization. As an example, our fee-for-service reimbursement model has transformed physiatry and pain management specialties to be highly procedure-oriented.

Sophisticated care coordination with care navigation is paramount in the management of CLBP but typically unavailable to most patients with CLBP. This coordination responsibility typically falls to the primary care provider, who is often overburdened and lacking the needed resources and infrastructure. Value-based insurance designs can provide a revenue stream to support multi-disciplinary rehabilitation and care navigation, therefore helping to transition to a new model of care for CLBP. This is particularly true when the provider organization is at risk for the cost of care of these patients. As we progress along the value-based care continuum, increasing our use of evidence-based therapies can improve long-term patient outcomes while reducing the total cost of care for patients with CLBP.

Table 1. Interventions with limited evidence of benefit in the treatment of CLBP

Intervention type	Evidence overview	Evidence-base	Place in therapy
Pharmacotherapy			
SSRI antidepressants	No benefit	Systematic review	Not indicated
Tricyclic antidepressants	No benefit	Systematic review	Not indicated
Acetaminophen	No benefit	Systematic review	Non indicated
Systemic glucocorticoids	No benefit	Systematic review	Not indicated
Benzodiazepines	Minimal to no benefit	Systematic review	Infrequently indicated
Skeletal muscle relaxants	Minimal to no benefit	Systematic review	Infrequently indicated
Gabapentinoids	No benefit; significant neurological and cognitive side effects	One-year RCT of pregabalin vs. placebo	Not indicated
Opioids	No benefit	Systematic review of trials up to 16 weeks	Infrequently indicated
Pain management injection procedures (ESI and facet injections)	No benefit	CMS technology assessment, including a systematic review and randomized trials from multiple sources	Indicated for acute radiculopathy only where a small benefit is noted
Lumbar decompression for spinal stenosis and decompression with or without fusion for degenerative spondylolisthesis	Benefit of decompression surgery for spinal stenosis vs. non-surgical care for up to four years Benefit of decompression surgery with or without fusion for up to four years	Large RCT	Indicated for failure of rehabilitative modalities or progressive neurological deficits
Lumbar fusion for 1 or 2 level degenerative spondylolisthesis in the absence of significant instability	No additional benefit from fusion when combined with decompression surgery	Meta-analysis of six RCTs RCT comparing microdecompression vs. decompression plus fusion	Generally fusion indicated for >2 level decompression or marked spinal instability
Vertebroplasty	Minimal to no clinical benefit	Meta-analysis finding based on four out of five RCTs	Infrequently indicated
Spinal cord stimulation	Minimal to no clinical benefit	Meta-analysis of eight studies of SCS on neuropathic pain	Infrequently indicated

At least 12 months of bisphosphonate therapy are needed to improve bone mineral health among women with osteoporosis

The U.S. Preventive Services Task Force recommends screening for osteoporosis in women 65 years and older and postmenopausal women younger than 65 years, but with osteoporosis risk factors.[2] A recent meta-analysis explored the time to benefit from bisphosphonate therapy among postmenopausal women with osteoporosis.[3] The authors analyzed data from 10 randomized clinical trials or subsequently published pooled analyses comparing a first-line bisphosphonate (alendronate, risedronate, or zoledronic acid) to placebo. The 10 studies comprised 23,384 women, aged 63-74 years, with osteoporosis, defined as a T-score of -2.5 or lower on bone mineral density testing.

Pooled analyses demonstrated that 12.4 months of bisphosphonate therapy were needed to prevent one non-vertebral fracture per 100 women treated (absolute risk reduction [ARR] of 0.01). Bisphosphonate therapy of 20.3 months was needed to prevent one hip fracture per 200 women treated (ARR of 0.005). To prevent one vertebral fracture, 200 women would need bisphosphonate therapy for 12.1 months (ARR of 0.005).

At least 12 months of bisphosphonate therapy are needed to achieve benefit. These results have two important implications. First, when starting treatment, the patient should be counseled about the time course for bisphosphonate therapy to become effective. Second, early fractures among patients with osteoporosis who are treated with a first-line bisphosphonate do not indicate a therapeutic failure and therefore may not warrant a medication change.

Additionally, since it takes at least two years to demonstrate improvements in bone density on DEXA (dual-energy X-ray absorptiometry) scanning, repeating the DEXA scan earlier than two years is not recommended.

First do no harm: As applied to persons with hypertension

The majority of patients with hypertension are not well controlled.[4] The American College of Cardiology in their 2017 guidelines provide a list of medications that can lead to hypertension.[5] Researchers from Beth Israel Deaconess Hospital used the National Health and Nutrition Examination Survey (NHANES) to determine how often medications that can lead to hypertension (MBP↑) are used in persons with hypertension (HTN).[6]

NHANES is a biannual survey of noninstitutionalized persons in the United States. This study looked at five survey cycles of NHANES from 2009 to 2018. Prescription medication use was self-reported to the NHANES interviewers as part of the survey. Hypertension was defined as average systolic BP of 130 mm Hg or higher, average diastolic BP of 80 mm Hg or higher, or answering "yes" to the question, "Have you ever been told by a doctor or other health professional that you had hypertension, also called high blood pressure?" Data from 27,599 individuals at least 18 years of age was included. The prevalence of MBP↑ was assessed. A logistic regression model was constructed to determine any relationship between HTN and MBP↑ and the use of MBP↑ was studied relative to the number of antihypertensive medications used.

The use of MBP↑ was reported by 14% of all persons and 18.5% of persons with HTN. The most common MBP↑ were NSAIDS, steroids, and estrogens. The relationship between MBP↑ in persons with HTN is summarized in the table.

Relationship examined	Effect	Odds ratio (95% confidence interval)
Use of MBP↑ on risk of uncontrolled HTN* in persons **NOT** taking HTN medication	Present	1.24 (95% CI, 1.08-1.43)
Use of MBP↑ on risk of uncontrolled HTN in persons **taking** HTN medication	Not present	Not reported
Use of MBP↑ on the number of HTN medications use in those with **controlled** HTN	Present	1.27 (95% CI, 1.11-1.44)
Use of MBP↑ on the number of HTN medications use in those with **uncontrolled** HTN	Present	1.13 (95% CI, 1.03-1.25)

* Uncontrolled hypertension was defined as an average systolic BP reading of 130mmHg or higher or an average diastolic BP reading of 80mmHg or higher.

Polypharmacy is a well-recognized problem for many patients, increasing medication side-effects and drug interactions as illustrated by this study. In many cases MBP↑ may be discontinued or replaced by an alternative medication. There is an opportunity for heightened awareness of the negative influence that MBP↑ have on HTN management.

Table 1. Prevalence of Use of Medications That May Raise Blood Pressure (BP) Among US Adults, 2009-2018

	Survey participants, % (95% CI)		
		Adults with	
	US adult population	Hypertension[a]	Uncontrolled hypertension[b]
Unweighted No.	27 599	14 629	10 696
Weighted No.	225 284 279	111 056 498	79 921 633
Use of medications that may raise BP			
Any	14.8 (13.9-15.8)	18.5 (17.5-19.5)	17.4 (16.3-18.5)
1	12.3 (11.7-12.9)	14.9 (14.1-15.8)	14.1 (13.1-15.1)
≥2	2.5 (2.2-2.9)	3.6 (3.1-4.1)	3.3 (2.7-3.8)
Use of classes of medications that may raise BP			
Antidepressants	6.7 (6.2-7.3)	8.7 (8.0-9.5)	7.9 (7.0-8.8)
NSAIDs	4.9 (4.4-5.3)	6.5 (5.8-7.2)	6.2 (5.4-6.9)
Steroids	1.4 (1.2-1.6)	1.9 (1.6-2.1)	1.7 (1.4-2.0)
Estrogens	1.4 (1.2-1.6)	1.7 (1.4-2.0)	1.6 (1.3-1.9)
Stimulants	1.1 (0.9-1.4)	0.9 (0.6-1.1)	1.0 (0.7-1.4)
Testosterones	0.4 (0.2-0.5)	0.4 (0.2-0.6)	0.4 (0.2-0.6)
Antiobesity agents	0.2 (0.1-0.3)	0.2 (0.1-0.3)	0.1 (0.1-0.3)
Decongestants	0.2 (0.1-0.4)	0.4 (0.2-0.6)	0.4 (0.1-0.7)
Antipsychotics	0.1 (0.1-0.2)	0.2 (0.1-0.3)	0.2 (0.1-0.4)
Immunosuppressants	0.1 (0.0-0.1)	0.2 (0.1-0.3)	0.2 (0.1-0.3)
α Agonists	<0.01	0.0 (0.0-0.0)	0.0 (0.0-0.0)
Antirheumatics	<0.01	0.1 (0.0-0.1)	0.1 (0.0-0.1)
Use of antihypertensives			
1	13.2 (12.5-13.9)	23.3 (22.2-24.4)	19.8 (18.8-20.9)
2	8.9 (8.3-9.4)	17.0 (16.0-18.0)	13.0 (12.1-14.0)
>3	4.9 (4.5-5.3)	9.8 (9.1-10.6)	7.9 (7.2-8.6)

Abbreviation: NSAIDs, nonsteroidal anti-inflammatory drugs.

[a] Hypertension was defined as an average systolic BP reading of 130 mmHg or higher, average diastolic BP reading 80mmHg or higher, or answering "yes" to a hypertension questionnaire.

[b] Uncontrolled hypertension was defined as an average systolic BP reading of 130mmHg or higher or an average diastolic BP reading of 80mmHg or higher.

Atrial fibrillation and stroke: What is the role of implantable loop recorders?

Although subclinical atrial fibrillation (AF) is associated with increased stroke risk, previous studies have shown that most strokes are not preceded by a recent episode of AF.[7,8] This finding begs the question: Is AF a risk factor or a risk marker for stroke?

Using Optum and CareLink databases, a recent study evaluated the temporal relationship of AF (detected by implantable device) and stroke.[9] Patients with a stroke and at least 120 days of monitoring prior to the event were included. An AF episode was defined as ≥5.5 hours AF. The main outcome measure was the odds ratio (OR) for stroke comparing AF during days 1-30 (control period) versus days 90-120 (case period) prior to stroke.

891 patients met inclusion criteria. Most patients (76.5%) did not have an AF episode in either the control or case periods. AF episodes were present during both the control and case periods in 16% of patients. Among the remaining 7.5% of patients, 52 had AF during the case period only versus 14 (1.5%) with AF during the control period only (OR 3.71). Stroke risk was increased most within five days of the AF episode (OR 5). AF >23 hours duration had the highest associated stroke risk (OR 5). These data support AF as a direct, temporal stroke risk factor. It is worth noting that in this large cohort of patients with stroke, 17.5% of strokes were related to AF that was present within the 30-day period prior to the stroke.

Additionally, a meta-analysis of three randomized controlled trials evaluated the AF detection rates with implantable loop recorder (ILR) versus usual care following ischemic or hemorrhagic stroke.[10] Stroke types were stratified as cryptogenic, small- or large-vessel, or embolic. Pooled data from 1,233 patients were analyzed. The AF detection rate was 13% with ILR versus 2% with usual care over a 12-month study period. Stroke or transient ischemic attack occurred in 7% of the ILR patients and 9% of the usual care patients. Patients with previous cryptogenic or embolic stroke and detected AF were more likely to receive oral anticoagulants (97% and 100%, respectively) compared to patients with strokes attributed small- or large-vessel disease (68%). Although ILR was superior to usual care in AF detection, AF was relatively rare across patients, and there was no significant reduction in stroke or TIA rate with ILR monitoring.

COVID testing in the Omicron era

Over the course of the SARS-CoV-2 pandemic we have come to understand a great deal about the infectivity, incubation period, clinical presentation, duration of symptoms, viral shedding, and immunologic response to SARS-CoV-2. We now understand how these characteristics differ from ancestral strains to most recently Delta and Omicron variants. We have also developed multiple tests to detect SARS-CoV-2. Antigen tests (Ag) have lower sensitivity and specificity for SARS-CoV-2 but are low cost and have rapid turnaround. Nucleic acid amplification tests (NAAT), also known as PCR tests, have remarkable sensitivity but remain positive well past a person's infectious period. Antibody tests and viral cultures are also now readily available, but their use should be restricted to special circumstances. This interplay between disease, viral presence and persistence, symptoms, infectivity, test choice and public health policy is a complex, partially choreographed, and still developing dance. Peeling et. al do a remarkable job of discussing and reviewing this information and present succinct testing recommendations.[11]

Characteristics of SARS-CoV-2 that influence test choice in a particular setting:

- SARS-CoV-2 typically is present and infectious two days before symptoms onset.
- Viral load peaks just before or around the time of symptom onset and rapidly decreases after symptoms begin.
- Virus is rarely present beyond eight days after symptom onset in normal hosts with mild disease.
- Unlike most diseases, IgM and IgG antibody responses to SARS-CoV-2 both peak almost at the same time 11-14 days after symptom onset.
- 106 viral genome copies/ml is estimated to be the viral load needed for transmission to occur.

Characteristics of tests that impact recommended utilization at various stages of SARS-CoV-2 infection:

- In patients with a high pretest probability of infection, Ag tests alone reliably confirm COVID-19.
- The limit of detection of Ag test are 105 to 106 viral genome copies/ml.
- The limit of detection of NAAT is 102 to 103 viral genome copies/ml.
- NAAT can detect SARS-CoV-2 RNA well after active infection has passed.

Taken together these characteristics highlight several key testing considerations. First, Ag tests with a high pre-test probability (i.e. exposed, symptomatic individuals) do not need verification of a positive test with a NAAT. Second, Ag tests level of detection roughly correlates with the viral load associate with infectivity, therefore those with a negative Ag test are not likely to be infectious. Therefore, Ag tests have an advantage over NAAT in following

a patient's recovery and giving clearance for return to work. Third, NAAT with the high sensitivity they provide are excellent in confirming a diagnosis and detecting disease more than five days post symptom onset, when an antigen test may already be negative. Finally, persistent NAAT after infection can occur based on the exquisite sensitivity of the tests and does not necessarily correlate with ongoing clinical disease or infectivity.

The authors outline when testing should be considered for asymptomatic screening including health care facilities, workplaces, schools and mass gatherings (e.g., religious, sports, music). This review outlines how knowledge of SARS-CoV-2 clinical presentation and viral dynamics coupled with understanding individual test performance characteristics inform testing decisions.

Platelet-rich plasma not effective for knee, ankle osteoarthritis or Achilles tendinopathy

ODespite mixed evidence of effectiveness and conflicting guidelines from different medical societies, platelet-rich plasma (PRP) is sometimes used in clinical practice to treat degenerative conditions such as knee or ankle osteoarthritis (OA), or Achilles tendinopathy. Recent high-quality evidence highlights the **lack of effectiveness** for most patient-oriented measures.[12]

In the prospective, double-blinded, randomized controlled RESTORE trial in Australia, Bennell and colleagues administered a series of three PRP or placebo knee injections to 288 community-based patients >49 years of age with symptomatic medial knee OA.[13] There were no significant differences in the two primary outcomes at 12 months; a patient-reported knee pain score, and a quantitative measure of cartilage volume in the knee as measured with MRI.

Kearney and colleagues demonstrated a similar lack of significant effectiveness of using PRP in treating midportion Achilles tendinopathy.[14] This study was a prospective blinded randomized controlled trial of a single PRP injection versus a subcutaneous sham dry needle procedure and involved 240 adults in the United Kingdom with Achilles tendon pain for more than three months. Difference in the primary outcome of symptom score on a validated survey instrument was not statistically significant between the two groups at six months.

In a third recent study, Paget and colleagues observed similar results for the condition of ankle OA.[15] This prospective double-blinded randomized controlled trial done in the Netherlands examined the difference in symptom scores using a validated survey instrument in 100 adults with symptomatic ankle OA. Two injections to the ankle were administered six weeks apart with the study group receiving PRP and the control group receiving normal saline. There was no significant difference in the primary outcome.

Previous issues of this Forum and the Optimal Care algorithm have addressed various aspects of treatment for knee and for shoulder dysfunction. To summarize:

- Neither arthroscopic meniscectomy[16,17] nor viscosupplementation[18] are routinely indicated for knee OA.
- Physical therapy typically yields better patient-oriented outcomes than glucocorticoid injection for knee OA,[19] although both have documentation of effectiveness and may be used in combination.
- Physical therapy is as effective as surgery for frozen shoulder.[20]

With the additional evidence summarized above, PRP should be added to the list of 'do not routinely use', not only for knee OA, but also for ankle OA and for Achilles tendinitis.

Even subsegmental pulmonary embolism may need anticoagulation treatment

Acute pulmonary embolism (PE) of segmental, or proximal, arteries has a clear indication for anticoagulation to treat the event and avoid recurrence. Embolism of more distal, subsegmental arteries does not have such a clear indication. Diagnosis of PE has been covered in a previous issue of the Forum,[21] and an algorithm is available to help guide diagnostic decision-making.[22] For patients diagnosed with subsegmental PE and no risk factors for PE including no ultrasound evidence of proximal lower extremity deep vein thrombosis, the risk of recurrence was thought to be low and clinical guidelines recommended surveillance over anticoagulation in these patients.[23] The recent publication of the SSPE study by Le Gal et al.[24] examining this population of patients, should have us re-examine this approach.

This multinational prospective cohort study of patients with subsegmental pulmonary embolism (SSPE) who were managed with surveillance and not with anticoagulation showed an incidence of recurrent PE of 3.1% (CI, 1.6% to 6.1%) within 90 days from the diagnosis of the initial PE. This is a higher rate than expected, and suggests anticoagulation be strongly considered as a management strategy in these patients to prevent recurrence.

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Kenneth Roy Cohen, MD, FACP

Dr. Kenneth Cohen is an experienced physician leader, practicing internist, and researcher who has attained national recognition for health care quality improvement. He was one of the founding physicians of New West Physicians, which is the largest primary care group practice in Colorado and now part of Optum Care. He served as Chief Medical Officer from 1995 - 2020. He now serves as the Executive Director of Clinical Research for UHG R&D and Senior National Medical Director for Optum Care. Dr. Cohen has received awards of recognition and distinction for teaching, including the Lutheran Medical Center Physician of the Year award in 2011. Under his stewardship New West Physicians was awarded the AMGA Acclaim award in 2015 and the Million Hearts Hypertension Champion Award in 2017. He is a Clinical Associate Professor of Medicine and Pharmacy at the University of Colorado School of Medicine. Dr. Cohen holds degrees from Dickinson College and Hahnemann University. He is a Fellow of the American College of Physicians and a member of the Phi Beta Kappa and Alpha Omega Alpha honor societies.

John Hitt, MD, MBA

Dr. Hitt is the Evidence-Based Medicine Implementation Sage and Senior National Medical Director for Optimal Care. He has been a physician executive for more than 25 years. Prior to joining Optum, he was Chief Medical Officer at Maricopa Integrated Health System (MIHS) in Phoenix Arizona. Dr. Hitt was a key member of the senior leadership team at MIHS having responsibility for Medical Staff Services, Grants and Research, Academic Affairs, Risk Management, physician contracted services and coordinated the activity of Residency Program Directors, Clinical Department Chairs, and Medical Staff.

He served as the Chief Medical Quality Officer for Hennepin Health System. He was a physician leader for VHA (now Vizient), Medical Director at Caremark International and the Vice President of Medical Affairs at the University of Minnesota Hospital.

Dr. Hitt graduated from the University of Virginia where he played division one soccer. He received his Medical Doctorate from the Medical College of Georgia (AOA honors), completed his Internal Medicine and Infectious Disease Fellowship at the University of Minnesota Hospital and Clinics and his MBA at the Carlson School of Management at the University of Minnesota. He is the proud father of seven children.

Geoffrey Heyer, MD

Dr. Heyer is board certified in neurology with special certification in child neurology and in headache medicine. Prior to joining our team, Dr. Heyer was an associate professor of neurology and pediatrics at The Ohio State University and Columbia University Medical Center, specializing in autonomic disorders, headache, and pain management. He has published over 50 peer-reviewed research papers and numerous editorials, clinical reviews, and textbook chapters. He also co-authored a textbook on childhood stroke and cerebrovascular disorders.

Dr. Heyer received his medical degree from Columbia University, College of Physicians and Surgeons. He completed his neurology and child neurology residencies at Columbia-Presbyterian Medical Center. He has additional research training from the Mailman School of Public Health, Columbia University.

Joshua Jacobs, MD, FAAFP

Dr. Jacobs is a Fellow of the American Academy of Family Physicians and an educator with over 20 years of clinical, academic, and leadership experience regionally, nationally, and internationally. He currently serves as National Medical Director for Provider Intelligence within Clinical Performance at Optum Care. In his various roles, he has established new organizational systems to empower clinicians, administrators, researchers, students and staff to thrive and succeed. Examples prior to joining Optum include establishing a new US LCME-accredited medical school; moving the national dialog at the Association of American Medical Colleges (AAMC) medical education services to be more student-centric and evidence-informed using principles of design thinking; helping the country of Singapore transition, accredit and modernize its medical educational model; consulting for the Japanese government on national patient safety initiatives; and creation and oversight of a successful medical device start-up company's research arm culminating in successful FDA clearance. He also has extensive experience in designing and presenting curricula and training sessions, editing, publishing, and grant writing in medical fields.

Dr. Jacobs is a Clinical Professor at the Washington State University College of Medicine. He graduated from Pomona College with honors and from the John A. Burns School of Medicine as a member of the Alpha Omega Alpha honor society.

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