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Connecting you to the Heritage Provider Network

■ FEATURE STORY

Microscale Devices

Caltech Leads Cutting-Edge Research and Development for Diabetes Testing

■ ANNOUNCEMENT

Dr. Merkin honored at New York Academy of Medicine Gala

Heritage Provider Network Earns Highest Rankings from California Association of Physician Groups
10 Consecutive Years in a Row

■ GROUP SPOTLIGHT

Learn how physicians can play a vital role in preventing opioid abuse, and meet Joshua Carroll - Victor Valley Medical Group's Employee of the Year

■ The Editorial



Richard Merkin, M.D.

Healthcare visionary, Dr. Richard Merkin, has spent the last 35 years implementing a successful, workable business model to address the needs and challenges of affordable managed healthcare.

The often-debilitating effects of diabetes affect millions of lives around the world. The daily routine of managing one's glucose levels using painful methods of testing – or having to resort to using faulty, unreliable equipment can be costly and inconvenient. One of the many challenges presented by current practices is that they fail to provide a continuous and consistent method of testing which ultimately affects the delivery of insulin. Patients often rely on the assistance of family members, or caregivers, to ensure proper testing is conducted at the appropriate times to achieve optimum care and management.

To alleviate this dilemma and provide a long-term solution for the millions who have diabetes, Heritage Medical Research Institute (HMRI) continues to collaborate with our scientists and engineers at the California Institute of Technology (Caltech) to push the boundaries of medical advancement forward.

Using nanotechnology and state-of-the-art electrical circuitry, Caltech hopes to deliver a wireless, implantable sensor and wearable reader that will work together to deliver instantaneous results by sending data directly to all mobile devices. This eliminates the use of needles and ineffective devices that require batteries to function. These devices will self-charge providing long-term continuity of monitoring glucose levels.

Caltech continues to pioneer in the areas of medical discoveries and advancements. HMRI is proud to support their efforts in delivering promising solutions to transform our healthcare system and create a lasting impact on the world.

A stylized, handwritten signature in black ink, consisting of a large 'R' and 'M'.

Richard Merkin, M.D.
President and CEO of HPN

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Comments? Questions?

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■ FEATURE STORY

Caltech uses microelectronics and nanotechnology to create wearable and implantable devices to detect and relay glucose levels

MICRO SCALE DEVICES: THE FUTURE OF DIABETES TESTING AND MANAGEMENT

**CALTECH USES MICROELECTRONICS AND
NANOTECHNOLOGY TO CREATE WEARABLE
AND IMPLANTABLE DEVICES TO DETECT
AND RELAY GLUCOSE LEVELS**

Azita Emami, Professor of Electrical and Medical Engineering at the California Institute of Technology, is paving the way into cutting-edge research to improve the quality of life for the millions of people around the world who have diabetes. More than 422 million people worldwide are affected by diabetes¹, and today's methods of testing continue to leave

an often painful and costly outcome. With the use of microelectronics and nanotechnology embedded in an implantable glucose sensor, diabetics will be able to wear a device that will consistently monitor their glucose levels and immediately notify them as soon as their glucose levels change. The wearable reader works with the implantable sensor



**Azita Emami, Ph.D., Cherng
Professor of Electrical
Engineering & Medical
Engineering at Caltech,
HMRI Investigator, EAS
Division Deputy Chair**

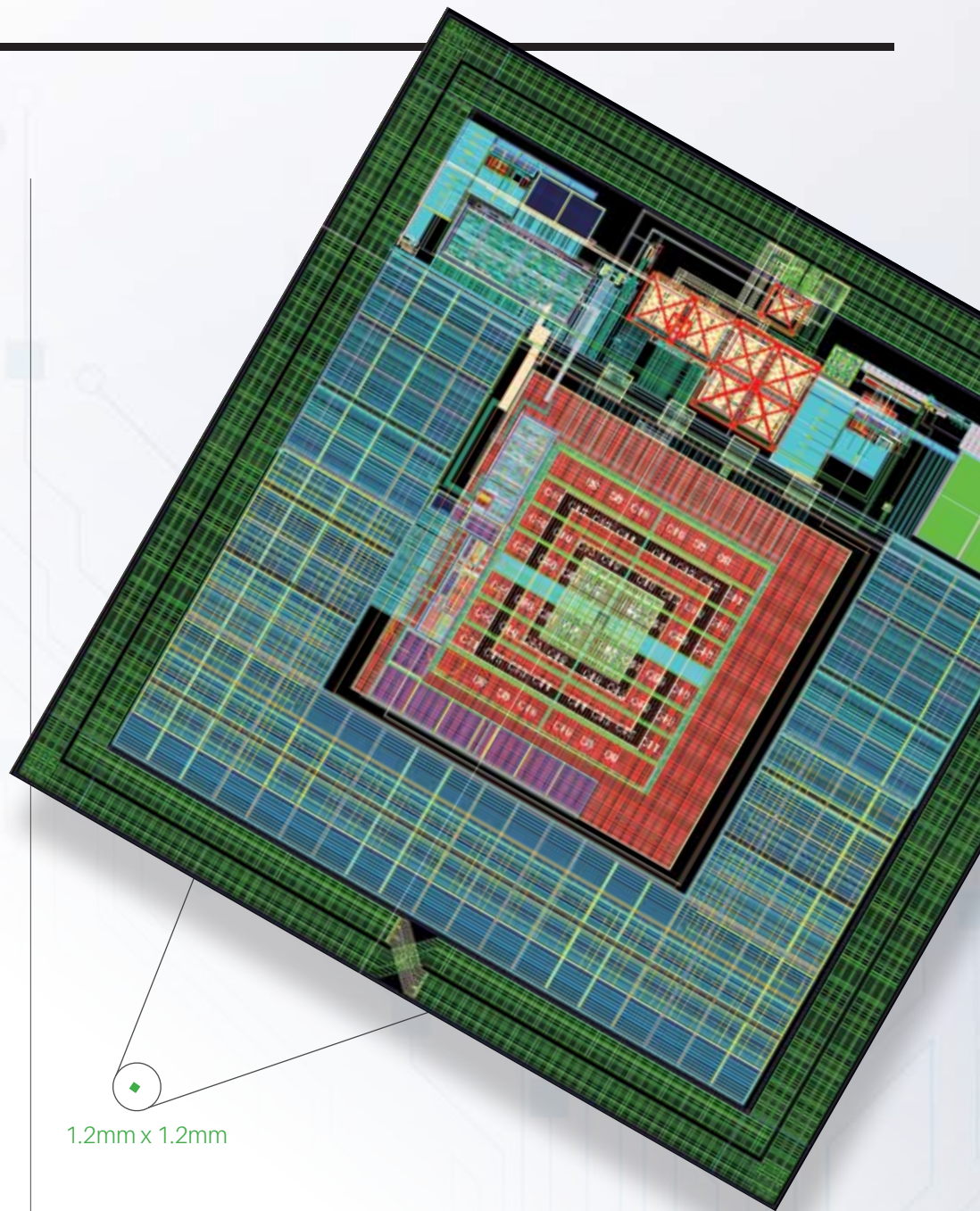
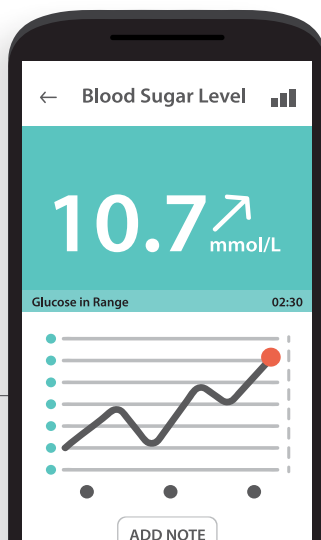
Professor Emami received her M.S. and Ph.D. degrees in Electrical Engineering from Stanford University in 1999 and 2004. She received her B.S. degree from Sharif University of Technology in 1997, with honors. In 2007, she joined Caltech, where she is now a Professor of Electrical Engineering and Medical Engineering. Her areas of research at Caltech is to design and develop high-performance, reliable, low-power mixed-mode circuits in highly scalable technologies that can lead to the advancement of theory and creation of new integrated systems. The applications for this work cover everything from mixed-signal integrated circuits for digital data communication, low-power sensors, very-large-scale-integrated (VLSI) systems, optoelectronics, and biomedical devices.

to effectively monitor and diagnose one's glucose levels. The sensor functions and operates requiring low power with enough range to relay the message back to the reader, thus providing instantaneous results.

...a Bluetooth component that will send digital information to your smartphone...

WIRELESS SENSOR DELIVERS REAL-TIME RESULTS

In collaboration with Axel Scherer, Bernard Neches Professor of Electrical Engineering, Applied Physics and Physics at Caltech, the initial research began with the creation of an implantable version – a subcutaneously administered device that would provide the best results for accuracy and overall sensitivity. The implant requires no batteries to operate, as it will be powered via wireless radio frequency (RF) power delivery. The battery-less device is extremely small with surface area of about 250 times smaller than a US penny, each side equal to 10 strands of hair, which will make it an ideal and minimally invasive



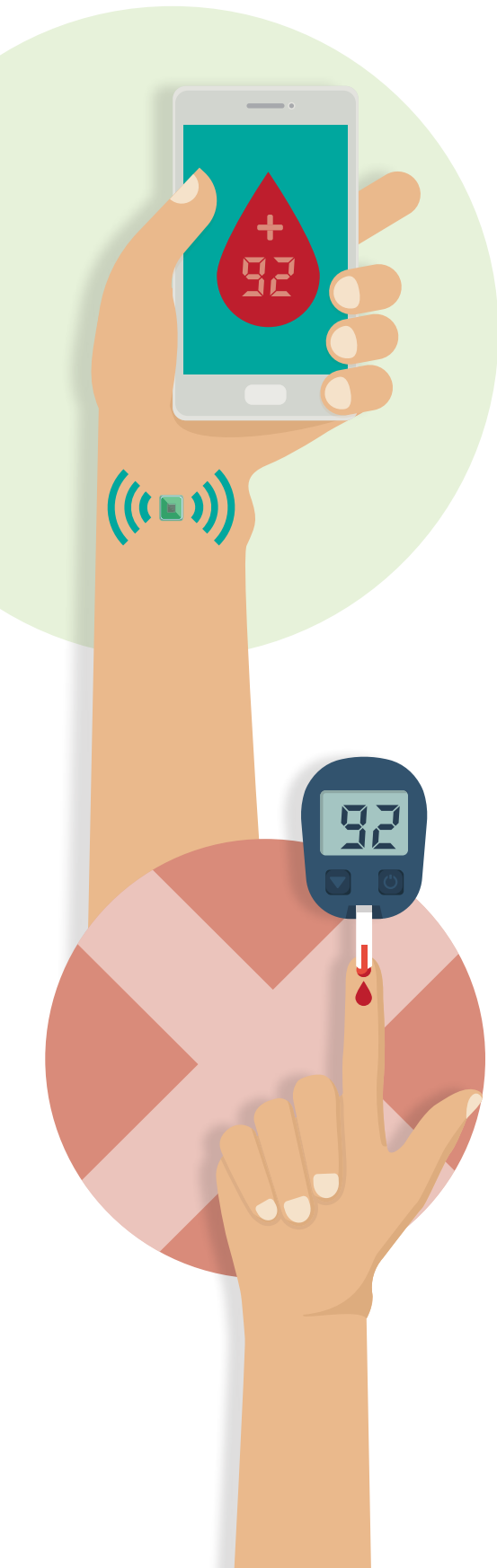
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implantable device. Using the latest innovation in circuitry, it will harness state of the art dynamic range, resolution and energy efficiency.

The external, wearable reader has the ability to

MICROENGINEERING & NANOTECHNOLOGY AT CALTECH ↑

Caltech continues to pioneer in the areas of medical discoveries and advancements. With the use of microengineering and nanotechnology they continue to make huge strides in medical science.



THE BENEFITS OF IMPLANTS VS. CURRENT TESTING METHODS

- Implants are more convenient, easier to access and monitor
- More cost-effective as it can be made available at a lower cost
- Less painful for diabetics to test instead of pricking finger or wearing surgically attached sensor

interface and communicate data back to all mobile devices. It can be used with a Bluetooth component that will send digital information to your smartphone wirelessly. Another benefit to this invention will be its ability to serve as a life alert to notify the person's list of personal contacts, including their physician of any changes in their glucose levels.

PRESERVING ENZYMES

Enzymes are a crucial component to the sensor's functionality. Although current development and implementation seem promising, they discovered that improving the overall lifetime of the sensor proposed a major challenge. While the electronic components are small, wireless, and can remain in the body for an extensive amount of time, it remains limited by inherent enzyme degradation. Once enzyme degradation occurs, the sensor begins to lose its sensitivity and becomes ineffective. With this in mind, combating enzyme degradation presented the team with constructing

several strategies using selective binding techniques and self-assembly with its main goal of protecting the enzyme. "We created nano-structures and used 3D geometry to try and enhance the lifetime of the sensor," adds Professor Emami. "So far, we have managed to get up to two months of having the device fully operational, which is still promising compared to other devices that are based on standard approaches."

THE FUTURE OF IMPLANTABLE SENSORS

While the primary focus of Professor Emami's research is enhancing the science and technology behind the implantable version, there is no reason they can't utilize the same device as a wearable patch. She and her team are conducting tests on multiple devices to enhance surface sensitivity and ultimately make the technology readily available. Parallel testing and measurements of the patch as it works alongside the implant helps to record its progress to calibrate usability.

In their continued efforts to find a viable solution, one possible variable for the wearable patch would be to test this method on post-operation patients by monitoring their glucose levels. The patch would be feasible for those who do not require an exact and accurate measurement of glucose levels. On the other hand, diabetics would benefit most from the implantable sensor to achieve optimum results that are more accurate.

Ultimately, the future goal is to create implants that can measure other important compounds and have the ability to auto-trigger the release of the insulin – or other drug directly into the bloodstream. Professor Emami adds, “I’m passionate about developing devices for those inflicted with chronic conditions, as it will potentially impact their overall quality of life. My students are equally passionate about their involvement in such significant, translational research. HMRI’s support and contribution have been monumental in helping us push this research forward, further enabling the medical advancements in this field possible.”

¹Source: World Health Organization (WHO) – “Global Report on Diabetes”, 2016

HMRI +  Caltech



DEEP™ Graduates 2017

Affiliates of HPN Tackle Diabetes by Offering Diabetes Empowerment Education Program

Regal, Lakeside, and ADOC Medical Groups, affiliates of Heritage Provider Network, are doing their part to fight the war against diabetes and help hundreds of their members manage their health by offering their Diabetes Empowerment Education Program (DEEP™).

DEEP is a no-cost, six-week program that provides members with information and practical skills to help manage the daily challenges of diabetes. The program is interactive and conducted in a fun and supportive environment. All members who are 65 years or more who participate in all six sessions receive a \$100 gift card and a certificate of completion.

Since DEEP was implemented in October 2016, nearly 400 members have completed the program successfully. Thanks to its notable success, hundreds of members with diabetes who complete the program not only learn to manage this often-debilitating disease, but they also discover new ways to live longer and more fulfilling lives. Health educators are making a difference by teaching them proper diet and nutrition, meal planning, exercise, and by providing the necessary support to answer questions they may have about their health.



Take a look at the September issue of *Nature* magazine which highlights the collaborative efforts of Professor Emami and Mikhail Shapiro, Assistant Professor of Chemical Engineering, Heritage Principal Investigator Biochemistry and Molecular Biophysics, Chemical Engineering at Caltech.

Read the full article that features more detailed information about their implantable, magnetic microscale devices using transmitters to detect cancer cells. www.nature.com/articles/s41551-017-0129-2

DR. MERKIN HONORED AT NEW YORK ACADEMY OF MEDICINE GALA



From left to right, Julie L. Gerberding, M.D., MPH, Richard Merkin, M.D., and Jo Ivey Boufford, M.D.

PRESIDENT AND CEO OF HERITAGE PROVIDER NETWORK APPLAUDED FOR VISIONARY WORK

By Janet Janjigian

New York, June 16, 2017: The New York Academy of Medicine honored Richard Merkin, M.D., President and CEO of Heritage Provider Network, at its annual gala on June 13 at Cipriani 25 Broadway. The event celebrated visionary leadership in urban health and outstanding journalism on issues affecting the health

of people living in cities. The Academy honored Dr. Merkin for his ambitious work in improving population health through physician-led, patient-centered, integrated healthcare.

“I am deeply honored to receive the visionary global leader award in healthcare delivery, innovation

and philanthropy from the New York Academy of Medicine,” said Dr. Merkin. “I share and applaud their deep commitment and vision for healthy cities through improved healthcare that impacts the lives of millions of New Yorkers. The work of the Academy and its members leads us to critical, lifesaving breakthroughs impacting the intersection of science and technology, never more critically important than now.”

Also honored were Julie L. Gerberding, M.D., MPH, Executive Vice President and Chief Patient Officer, Strategic Communications, Global Public Policy and Population Health at Merck & Co., Inc.; and Academy President Jo Ivey Boufford, M.D. Jay Hancock, of Kaiser Health News, received the 2017 Urban Health Journalism Prize, for the project, “Health Care in Freddie Gray’s Neighborhood: Baltimore’s Other Divide.”

Established in 1847, The New York Academy of Medicine advances solutions that promote health

and well-being of people in cities worldwide. This is accomplished through the Institute for Urban Health, home of interdisciplinary research, evaluation, policy, and program initiatives; their world class historical medical library and its public programming in history, the humanities and the arts; and their Fellows program, a network of more than 2,000 experts elected by their peers from across the professions affecting health.

Video highlights of the event are available here: https://youtu.be/lp_TRguFo-w



"I am deeply honored to receive the visionary global leader award in healthcare delivery, innovation and philanthropy from the New York Academy of Medicine."

~ Dr. Richard Merkin



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HERITAGE PROVIDER NETWORK EARNES HIGHEST RANKING FROM CALIFORNIA ASSOCIATION OF PHYSICIAN GROUPS 10 CONSECUTIVE YEARS IN A ROW

YEARS OF EXCELLENCE

HONORED WITH ELITE STATUS ACHIEVED FOR ALL MEDICAL GROUPS IN CAPG'S STANDARDS OF EXCELLENCE

By Janet Janjigian

Marina del Rey, California – June 23, 2017: Heritage Provider Network (HPN), one of the nation's most experienced and innovative physician led value based care organizations, proudly announced HPN and its family of medical groups has earned the highest rankings of Elite Status for providing top quality care from the California Association of Physician Groups (CAPG) 2017 Standards of Excellence™ Survey. This is the 10th consecutive year HPN has achieved Elite Status in the CAPG survey, the highest possible honor awarded. (www.heritageprovidernetwork.com)

“For the last 10 years, we have received the highest acknowledgement from CAPG

recognizing the tremendous hard work and dedication of all of our medical groups, physicians and team members who are improving the quality and cost of healthcare for everyone in the country,” said Dr. Richard Merkin, President and CEO of HPN. “I’m very proud to work with them and know how committed they remain to changing lives through patient centered care,” he continued.

CAPG's Standards of Excellence™ Survey scores 190 medical group members in 38 states, Washington DC and Puerto Rico assessing the ability to deliver an overall improved patient experience,

ELITE STATUS IN ALL CATEGORIES OF THE SURVEY WAS ACHIEVED BY HPN'S FAMILY OF MEDICAL GROUPS INCLUDING:



- ADOC Medical Group
- Sierra Medical Group
- Regal Medical Group
- Lakeside Community Healthcare
- Heritage Victor Valley Medical Group
- High Desert Medical Group
- Desert Oasis Healthcare
- California Coastal Physician Network
- Bakersfield Family Medical Group

improved population health, and better overall affordability.

HPN received the coveted Elite Status of Excellence for its medical groups in all categories including Care Management Practices, Health Information Technology, Accountability and Transparency and Patient Centered Care. This year, CAPG raised the bar in each category to align with the program's mission to drive enhanced performance and quality of care.

"Our Standards of Excellence™ Survey is recognized as the industry standard by which the nation's healthcare systems

can assess the delivery of accountable and value-based care and improve patient care coordination, in line with the nation's movement towards alternative payment models," said Donald Crane, CAPG President and CEO. "I congratulate HPN for their 10 consecutive years of achievement as they continue to deliver outstanding healthcare that serves as a model for the rest of the country."

HPN + CAPG

DOCTORS PLAY A PART IN PREVENTING EASY ACCESS TO OPIOIDS



Kawika Liu, M.D.
Associate Medical Director
Desert Oasis Healthcare

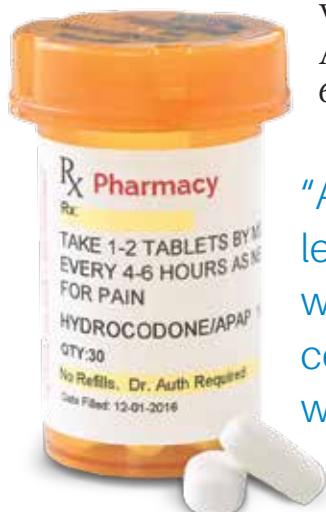
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KLiu@mydohc.com or call
(760) 320-8814, ext. 1319



On Thursday, July 20, The Desert Sun published, “Stop delivery of opioids via Postal Service”. While the article points out the significant problem of synthetic opioids sent across our borders through mail order, many U.S. doctors’ offices may also be unknowingly contributing to the crisis proportions of opioid abuse.

Fatal overdose is now the #1 cause of accidental death in the U.S., often through prescription painkillers, like hydrocodone, Vicodin, Norco and others. Although the U.S. is less than 6% of the world’s population,

“Although the U.S. is less than 6% of the world’s population, it consumes 95% of the world’s hydrocodone.”




it consumes 95% of the world’s hydrocodone. Based on the most recent data available, as of 2014, there were 6.14 opioid overdose deaths for every 100,000 Riverside County residents.

Twenty years ago, the pharmacist would have questioned a prescription for more than a week’s supply of opioids, unless the patient had cancer or was in hospice. Today, people are often on high doses of opioids on an ongoing basis. It is not surprising that we are seeing a significant increase in the incidence of prescription drug-related overdoses.

The reality is that most patients who have a painful condition only require a few days of pain medication. The Centers for Disease Control and Prevention (CDC) have recommended between three and seven days of opioids for acute pain. After a few months of high levels of opioids, the patient may begin to develop side effects and problems that go beyond the original symptoms causing the pain.

We have to give even more thought to starting children on narcotics and sensitizing their brains and their chemistry to that medication for the rest of their lives. There is a pharmacologically predictable tolerance and dependence to any narcotic taken for more than four weeks.



"We have to give even more thought to starting children on narcotics and sensitizing their brains and their chemistry to that medication for the rest of their lives"

As physicians, we have to think carefully about the amount of medications that we are prescribing. It's possible that the prescriptions we're writing do not reach the person for whom it was prescribed, and not for pain – but for a recreational or suicide-related use. We also need to assess risk for use as prescribed, because deaths and overdoses have occurred even when medications are taken exactly as prescribed.

Doctors and their support staff must be fully aware of what a patient's pain medication needs truly are, prior to prescribing these potentially addictive drugs. This can be the beginning of reducing the amount of pills that are available in the community that might otherwise be used for purposes that were not originally intended.

Locally, the Safe Opioid Prescribing Task Force for the Inland Empire aims to meet these challenges head-on. The primary objectives of the coalition are education, training,

and communication among healthcare providers, pharmacists, and others, including those in the criminal justice community. The coalition also hopes to address issues like "pill mills" and "doctor shopping" that contribute to the abuse of opioids and other controlled substances.

The Task Force is still in the planning stages, but it has started with the distribution of safe prescription guidelines to emergency departments throughout the Inland Empire. If you are interested in learning more about safe prescribing

and public health approaches to substance use, please contact *Dr. Liu, Associate Medical Director at Desert Oasis Healthcare at 760-320-8814, ext. 1319, or by email at KLiu@mydohc.com.*

HPN +
DESERT  OASIS
HEALTHCARE



JOSHUA CARROLL AWARDED THE 2016-2017 BRILLIANCE AWARD

By Heritage Victor Valley Medical Group



Winner

Joshua Carroll, Maintenance and Operations, Heritage Victor Valley Medical Group was awarded this year's Brilliance Award.

Joshua Carroll, maintenance and operations worker at the Heritage Victor Valley Medical Group, was recently awarded this year's Brilliance Award, which is HVVMG's Employee of the Year accolade. While Carroll was genuinely surprised by the acknowledgement, those whom he interacts with on a daily basis were pleased to hear he was the recipient of this award that included being presented with a plaque and a \$500 award.

Joshua Carroll can often be found around the facility lending a hand to other departments in need of his services. His positive attitude and willingness to help others has created a lasting impact on the people around him. His reputation for possessing a great work ethic within the last five years he has been with the company continues to have a positive effect on the company and its employees. HVVMG Chief Operations Officer Merlin Aalborg, adds, "You would think that somebody working in maintenance would just stick to their assigned responsibilities, but whenever Josh sees anybody – a senior, another member who's in need, or looks to be confused, he is right there to assist them."

Carroll also helps with classes taught at the facility, ensuring that all members and employees are comfortable and equipped with what they need. He says, "I enjoy being able to help people

"I enjoy being able to help people and change lives for the better. It's a lot more fulfilling."

and change lives for the better. It's a lot more fulfilling."

Brilliance Award winners are selected from a group of employees who receive at least 36 SHINE cards. SHINE (Smile, Helping and Inspiring New Experiences) cards are submitted by employees and members throughout the year and represents a person's desirable qualities, behaviors, and actions that best contribute to patient satisfaction – all of which Carroll exemplifies. "The reason why the award was given to Josh was because we have numerous examples of where he went completely above and beyond to assist somebody who was either not doing well physically, or emotionally. He goes out of his way to assist others well beyond his scope of responsibilities," says Aalborg, who presented Carroll with the award. Now that Carroll is a Brilliance Award winner, he does not imagine things will change. His long-term goals remain focused on "Keep on keepin' on", as he expressed.

HPN + CRAIN'S
NEW YORK BUSINESS

Heritage Provider Network Affiliated Medical Groups

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For more than 35 years, HPN has provided quality, cost-effective healthcare to the communities we serve. Today, HPN and its affiliates manage the healthcare of more than half a million individuals and contracts with thousands of primary care physicians and specialists and hundreds of hospitals.

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Our Awards

RECOGNITION OF COMMITMENT AND EXCELLENCE

The recognition we have received demonstrates our practices in excellence. We're proud to be awarded for our commitment to our members and our community.



Wellness Excellence
Award in Health
Education –
Southern California
Foundation for
Health Care



Top Ten Physician
Medical Network
in California by
the California
Association of
Physician Groups



Elite Status of
Excellence for
the Standards
of Medical Care
by the California
Association of
Physician Groups



Recognized by
the Integrated
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Association (IHA)
for our diabetic
registries



NCQA Certification
for Credentialing