



## Canadian Journal of Urology Study Highlights the Benefits of Heparin and Alkalinized Lidocaine Combination Formulation for the Relief of Interstitial Cystitis Symptoms

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SAN DIEGO, May 18, 2015 /PRNewswire/ -- Imprimis Pharmaceuticals, Inc. (NASDAQ: IMMY), a pharmaceutical company focused on the development and commercialization of proprietary compounded drug formulations, today reported on a recent study demonstrating that combination heparin and alkalinized lidocaine resulted in significantly better relief of interstitial cystitis (IC) symptoms including relief of pain and urinary urgency, as compared to alkalinized lidocaine alone. The study,<sup>1</sup> conducted by a team of researchers led by C. Lowell Parsons, MD, was recently published in the *Canadian Journal of Urology*. Importantly, a separate study referenced in the article concluded that the combination heparin and alkalinized lidocaine yielded higher lidocaine absorption than unalkalinized lidocaine alone.



The study was undertaken to determine if the combination heparin and alkalinized lidocaine formulation was superior compared to alkalinized lidocaine alone in relieving IC symptoms. The blinded cross-over study enrolled 14 randomly-assigned IC patients who received both treatments on different days. The data demonstrated that patients treated with the combination formulation resulted in significantly better relief of IC symptoms, which included relief of pain and urinary urgency, compared to alkalinized lidocaine alone. These results are consistent with two other published studies<sup>2,3</sup> that demonstrate statistically significant efficacy of heparin and alkalinized lidocaine in relieving the symptoms of IC.

The results demonstrated that the heparin-lidocaine combination significantly reduced the percentage of bladder pain (38% versus 13%,  $p = 0.029$ ) and urgency (42% versus 8%  $p = 0.003$ ) compared to lidocaine. In addition, the patients' global assessment response, an overall evaluation of symptoms, was significantly better for the heparin-lidocaine combination at both 1-hour % improved (77% improved versus 50% improved,  $p = 0.04$ ) and 24 hours (57% improved versus 23% improved,  $p = 0.002$ ) after study drug treatment.<sup>1</sup>

Apart from the efficacy study, researchers also performed a separate study of a different group of patients to compare the serum lidocaine levels of the heparin and lidocaine formulation versus lidocaine alone. Serum lidocaine levels for the heparin-lidocaine combination were significantly higher compared to USP lidocaine (unalkalinized). The mean  $\pm$  SEM (standard error of the mean) was  $0.45 \pm 0.09$  mcg/mL and  $0.20 \pm 0.05$  mcg/mL, respectively ( $p = 0.019$ ). The results were measured by high performance liquid chromatography and demonstrated that serum levels of lidocaine were 2.25 fold higher with the combination formulation.<sup>1</sup>

The authors of the study stated, "There are potential problems when utilizing bladder instillation 'cocktails' with anesthetic agents that are publicized with little or no supporting evidence. Instilling a medication into the bladder does not necessarily result in absorption; scientific data need to be obtained to demonstrate this activity. If lidocaine is employed, it must be alkalinized and not precipitated to effectively absorb into the bladder wall. When the lidocaine precipitates, efficacy is seriously impaired."

Mark L. Baum, CEO of Imprimis, stated, "This study underscores the importance of our exclusively licensed intellectual property which allows for the combination of heparin and alkalinized lidocaine to treat the symptoms of IC in patients. Without our patented formulation and process, one would be unable to yield the performance as demonstrated in these studies. At our ImprimisRx pharmacies, the pH levels and lidocaine stability of our Hep-Lido-A or HLA™ compounded formulation are carefully monitored in a sterile environment during and after the components are mixed. Lastly, all Imprimis proprietary formulations are tested for sterility by a third party prior to dispensing and it is our policy to provide our customers with complete sterility results with each order."

Mr. Baum added, "We are pleased to highlight the importance of this study and believe that our patented HLA™ compounded formulation is an important treatment option for the millions of Americans suffering with this chronic condition."

To receive a copy of the study, please contact Erica Soto at [esoto@imprimispharma.com](mailto:esoto@imprimispharma.com). To view a video demonstration of the patented Hep-Lido-A compounded formulation compared to simply a mixture of heparin and alkalized lidocaine alone when heated to body temperature, please click <http://imprimispharma.com/hla-demo/>.

## **ABOUT HEP-LIDO-A FORMULATION AND IC**

Hep-Lido-A (alkalinized lidocaine and heparin) is a patented compounded formulation that is instilled directly into the bladder as an immediate treatment option for patients with IC. According to the [American Urology Association Guidelines](#) bladder instillations are considered a second line treatment option when self-management treatments do not provide symptom relief. Hep-Lido-A's new user-friendly kit includes a hydrophilic catheter, and ready to use compounded sterile pre-filled syringes, prepared by an Imprimis compounding pharmacy, providing added convenience for in-office instillation as well as for patients who perform at-home instillations.

Interstitial cystitis (IC), also known as painful bladder syndrome, is a chronic disease state characterized by bladder pressure, bladder pain, urinary urgency, and/or urinary frequency. It is estimated that as many as 10 million men and women<sup>4,5</sup> in the US alone suffer from IC, with women making up 80% of those affected. In severe cases, patients may need to urinate up to 60 times per day. Most IC patients experience flares that can dramatically worsen IC symptoms. A flare-up may last anywhere from 2 to 7 days or longer depending on the severity. Patients may experience as little as one flare-up in a year to multiple flare-ups during the course of a month.<sup>6</sup> For more information, visit [www.DefeatIC.com](http://www.DefeatIC.com).

*Imprimis' Hep-Lido-A compounded formulation may only be prescribed pursuant to a physician prescription for an individually identified patient consistent with federal and state laws governing compounded drug formulations.*

1. Parsons CL et al. Heparin and alkalized lidocaine versus alkalized lidocaine for treatment of interstitial cystitis symptoms. *Can J Urol.* 2015; 22(2): 7739-7744.
2. Parsons CL. Successful downregulation of bladder sensory nerves with combination of heparin and alkalized lidocaine in patients with interstitial cystitis. *Urology* 2005; 65(1): 45-48.
3. Parsons CL, et al. Alkalized lidocaine and heparin provide immediate relief of pain and urgency in patients with interstitial cystitis. *J Sex Med* 2012; 9(1): 207-212.
4. Berry SH, et al. Prevalence of symptoms of interstitial cystitis/painful bladder syndrome among adult females in the US. Available at: <http://www.ichelp.org/Page.aspx?pid=824>. Accessed February 6, 2015.
5. Clemens JQ, et al. Prevalence of painful bladder symptoms and effect on quality of life in black, Hispanic and white men and women. *J Urol.* 2007; 177(4): 1390-1394.
6. Interstitial Cystitis Association. Available at: <http://www.ichelp.org>. Accessed February 6, 2015.

## **IMPRIMIS PHARMACEUTICALS**

San Diego-based Imprimis Pharmaceuticals, Inc. (NASDAQ: IMMY) is a pharmaceutical company dedicated to delivering high quality and innovative medicines to physicians and patients at accessible prices. Imprimis' business is focused on its proprietary ophthalmology and urology drug formulations. The company's pioneering ophthalmology formulation portfolio is disrupting the multi-billion dollar eye drop market, addressing patient compliance issues and providing other medical and economic benefits to patients. Imprimis recently launched its urology business, which includes a patented formulation to address patients suffering from interstitial cystitis. For more information about Imprimis, please visit the company's corporate website at [www.ImprimisPharma.com](http://www.ImprimisPharma.com); ophthalmology business websites at [www.GoDropleless.com](http://www.GoDropleless.com) and [www.LessDrops.com](http://www.LessDrops.com); and urology business website at [www.DefeatIC.com](http://www.DefeatIC.com).

## **SAFE HARBOR**

This press release contains forward-looking statements within the meaning of the U.S. Private Securities Litigation Reform Act of 1995. Any statements in this release that are not historical facts may be considered such "forward looking statements." Forward looking statements are based on management's current expectations and are subject to risks and uncertainties which may cause results to differ materially and adversely from the statements contained herein. Some of the potential risks and uncertainties that could cause actual results to differ from those predicted include risks and uncertainties related to Imprimis' ability to make commercially available its compounded formulations and technologies in a timely manner or at all; physician interest in prescribing its formulations; risks related to its compounding pharmacy operations; its ability to enter into other strategic alliances, including arrangements with pharmacies, physicians and healthcare organizations for the development and distribution of its formulations; its ability to obtain intellectual property protection for its assets; its ability to accurately estimate its expenses and cash burn, and raise additional funds when necessary; risks related to research and development activities; the projected size of the potential market for its technologies and formulations; unexpected new data, safety and technical issues; regulatory and market developments impacting compounding pharmacies, outsourcing facilities and the pharmaceutical industry; competition; and market conditions. These and additional risks and uncertainties are more fully described in Imprimis' filings with the Securities and Exchange Commission, including its Annual Report on Form 10-K and its Quarterly Reports on Form 10-Q. Such documents may be read free of charge on the SEC's web site at [www.sec.gov](http://www.sec.gov). Undue reliance should not be placed on forward-looking statements, which speak only as of the date they are made. Except as required by law, Imprimis undertakes no obligation to

update any forward looking statements to reflect new information, events or circumstances after the date they are made, or to reflect the occurrence of unanticipated events.

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