



## BioSig Technologies, Inc. (OTCQB: BSGM) Target Price: \$3.53

BioSig Technologies, Inc. (OTCQB: BSGM, "BioSig") is an innovative medical device company based in Minneapolis, MN. Led by its flagship product line, the **PURE EP™ System** (Precise Uninterrupted Real-time evaluation of Electrograms), **BioSig** is developing products with the potential to improve outcomes for patients with complex cardiac arrhythmias (heart rhythm disturbances). BioSig is focused on commercializing products for the \$4 billion global market for electrophysiology (EP), which analyzes electrical activity in the heart to identify the cause and nature of arrhythmias.

### Investment Highlights

#### Expect 2017 to be pivotal year for BioSig

We see several catalysts on the horizon for BioSig in 2017. The company appears to have been garnering attention in its field with a favorable presence in well-regarded peer reviewed journals as it approaches commercialization for its flagship **PURE EP™ System**. The **PURE EP™ System** is designed to improve the process of identifying catheter ablation targets - areas of tissue to destroy that otherwise create a cardiac arrhythmia. On the regulatory front, BioSig is advancing toward a 510(k) FDA clearance pathway for the **PURE EP™ System**, which management expects to be complete during this calendar year (2017). If accomplished, we would see this as a major milestone for an emerging company with what appears to be a differentiated, innovative device in an industry segment that has been marked by consolidation.

#### PURE EP attracts attention in scientific community with PURE EP featured in leading peer-reviewed publication JACC

On January 11, 2017, BioSig announced that the **PURE EP System**, was featured in *The Journal of the American College of Cardiology (JACC): Clinical Electrophysiology*, a leading peer-reviewed publication focused on care and heart health in the area of cardiac electrophysiology. The article was called *Novel Electrophysiology Signal Recording System Enables Specific Visualization of the Purkinje Network and Other High-Frequency Signals*, and was completed by Dr. Samuel Asirvatham, Vice Chair of Cardiovascular Diseases and Program Director of Clinical Cardiac Electrophysiology Training Program at the Mayo Clinic in Rochester, MN, and his team. Dr. Asirvatham's study highlighted potential benefits of **PURE EP** versus standard recording systems, particularly using the **PURE EP** during catheter ablation for improved analysis of signals in the heart's lower ventricles, possibly improving treatment for these types of complex arrhythmias.

#### BSGM aiming for FDA clearance in 2017

BSGM is targeting FDA clearance for the **PURE EP System** by the end of 2017, via a 510(k) pathway. We would view this as a major accomplishment by management, and a potential valuation catalyst. The **PURE EP** appears to be establishing itself as a promising new tool for arrhythmia treatments, market, with favorable peer reviews and scientific collaborations at prestigious institutions including the Mayo Clinic and Mount Sinai, and UCLA, among others.

#### \$3.53 price target for BioSig

We have been encouraged by the progress made by BioSig since our initiation of coverage in February 2016 and note that shares have risen by more than 20% in that time. We see several opportunities ahead for BioSig and are maintaining a price target of \$3.53 at this time.

#### Stock Details (1/17/17)

OTCQB:	BSGM
Sector / Industry	Healthcare / Medical Devices
<b>Price target</b>	<b>\$3.53</b>
Recent share price	\$1.34
Basic Shares o/s (mn)	20.9
Market cap (in \$mn)	28.1
52-week high/low	\$2.20 / \$0.90

Source: Thomson Reuters,;

#### Key Financial (mn, unless specified)

	FY14	FY15A	FY16E
Revenues	0.0	0.0	0.0
EBITDA	(7.9)	(12.0)	(10.8)
EBIT	(7.9)	(12.0)	(10.8)
Net Income	(8.8)	(9.5)	(7.1)
EPS (\$)	-0.91	-0.70	-0.37

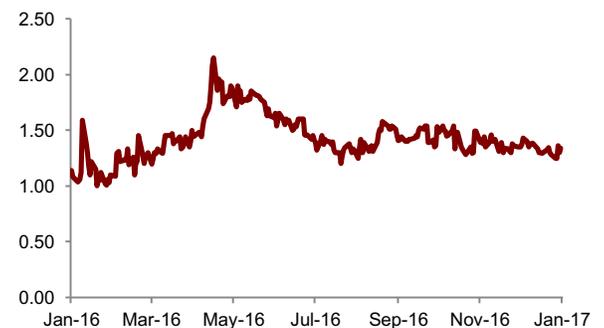
Source: SeeThruEquity Research,

#### Key Ratios

	FY14	FY15A	FY16E
Gross margin (%)	NM	NM	NM
Operating margin (%)	NM	NM	NM
Net margin (%)	NM	NM	NM
P/Revenue (x)	NM	NM	NM
EV/Revenue (x)	NM	NM	NM

Source: SeeThruEquity Research

#### Share Price Performance (\$, LTM)



Source: Thomson Reuters

**BioSig’s PURE EP receives positive peer review in leading third party journal JACC**

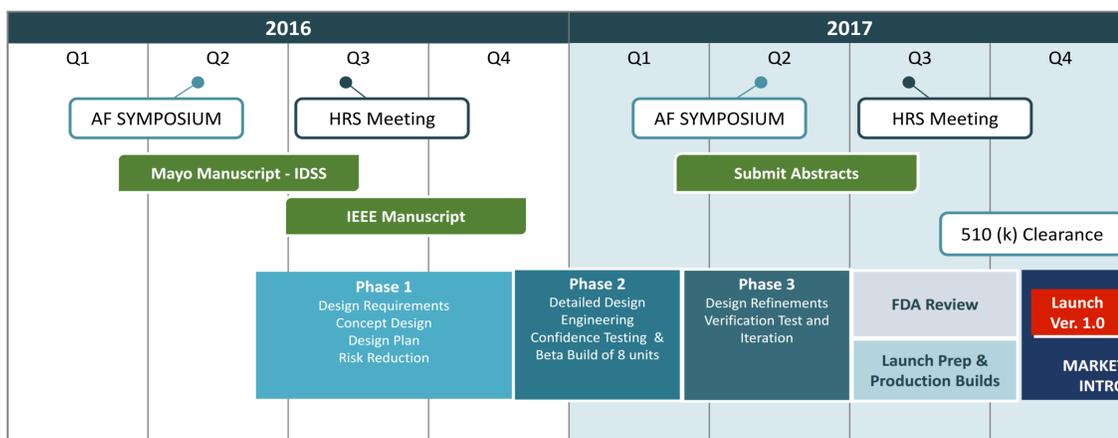
- On January 11, 2017, BSGM announced that its flagship device, the **PURE EP™ System**, was featured in a prestigious peer reviewed journal, *The Journal of the American College of Cardiology (JACC): Clinical Electrophysiology*.
- BioSig’s PURE EP System is a high-fidelity surface electrocardiogram (ECG) and intracardiac multichannel recording and analysis system, which is designed to improve the process of identifying catheter ablation targets - areas of tissue to destroy that otherwise create a cardiac arrhythmia.
- *JACC: Clinical Electrophysiology* is a leading peer reviewed publication that is dedicated to improving care and heart health in the area of cardiac electrophysiology. The article featuring BioSig’s PURE EP™ was “Novel Electrophysiology Signal Recording System Enables Specific Visualization of the Purkinje Network and Other High-Frequency Signals.” by Samuel J. Asirvatham, MD from Mayo Clinic, and his team.
- **Article features PURE EP:** The JACC article concluded that the PURE EP enabled improved high frequency signal visualization in all sites of cardiac conduction system. It also noted PURE EP’s capability to show the same channel with different processing options, enabling doctors to highlight specific features while still displaying the original electrogram signal.



**2017 has potential to be a watershed year for BSGM**

- BioSig appears to be positioned for a watershed 2017. PURE EP appears to be establishing itself as a promising new tool for arrhythmia treatments, market, with favorable peer reviews and scientific collaborations at prestigious institutions including the Mayo Clinic and Mount Sinai, and UCLA, among others.
- **Financing Update:** On the corporate development front, the company released an 8K in December stating that it raised \$2.4mn at \$1.50 per share, a premium to market prices. Management has stated that it is in the process of raising additional monies to support its 2017 development plans, including the 510(k) submission.
- **Expecting 510(k) submission in 2017:** BioSig management remains focused on preparing the company’s an all-important 510(k) submission to the FDA, which is expected in the first half of 2017, with management hoping for FDA clearance thereafter.

**PURE EP™ System: Path to Commercialization Supporting Activities**



- In our view, achieving FDA clearance for PURE EP would be a major milestone for BioSig, which should raise the profile of what appears to be a differentiated, innovative device in an industry segment that has been marked by consolidation. Along these lines, we note that Abbot's \$25 billion acquisition of St. Jude Medical closed on January 4, 2017.
- **Large Market Potential:** as we have noted in prior coverage of BSGM, the market opportunity for the PURE EP™ is large and growing, and has been characterized by a high degree of M&A activity and consolidation. BioSig is focused on improving the \$3.5 billion electrophysiology (EP) marketplace. The global market for EP is estimated to reach \$5.5 billion by 2019E according to research from *Global Industry Analysis*, with growth driven by the rising prevalence of cardiac arrhythmias.
- According to the American Heart Association (AHA), cardiac arrhythmias affect over 14.4mn Americans, with the most prevalent and deadly arrhythmias being Atrial Fibrillation (AF) and Ventricular Tachycardia (VT). In particular, growth in the EP market will be driven by an increase in AF arrhythmia, which is the fourth leading cause of death in the US. AF is the most common form of arrhythmia, and the AHA forecasts the number of AF cases in the US to rise from 2.7mn in 2010 to 5.6mn by 2050. AF is also a costly condition, with 600,000 hospitalizations per year causing a direct cost of about \$6 billion annually -- \$26 billion including indirect costs

### Price target of \$3.53 for BioSig

- We have been encouraged by the progress made by BioSig since our initiation of coverage in February 2016, and note that shares have risen by more than 20% since that time. Some of the contributing factors to this performance may include execution by management with impressive research collaboration partners such as the Mayo Clinic, the Texas Cardiac Arrhythmia Institute, and the UCLA Cardiac Arrhythmia Center, and growing industry awareness of the PURE EP™.
- We are encouraged by recent developments at the company as research at the Mayo Clinic continues and the company readies its 510(k) submission to the FDA, which is expected this calendar year (2017).
- Our target remains \$3.53 for BioSig. If achieved, the target represents potential upside of 167% from the recent price of \$1.34 on January 17, 2017.

## QUARTERLY FINANCIAL SUMMARY

**Figure 1. Income Statement Summary**

Figures in \$, unless specified	FY3Q16	FY3Q15	9 mos. Sep 2016	9 mos. Sep 2015
Revenue	0	0	0	0
Research & Development	560,514	354,471	2,139,671	1,146,113
General & Administrative	991,852	2,117,010	7,257,852	8,801,878
Depreciation & Amortization	2,570	2,607	7,811	7,948
Total Operating Expenses	1,554,936	2,474,088	9,405,334	9,955,939
YoY growth	-37%		-6%	
Operating Income	-1,554,936	-2,474,088	-9,405,334	-9,955,939
Operating Margin %	-902%	-2267%	-755%	-5372%
Other items, net	17,771	2,851,755	-807,086	2,519,316
Pref Stock Dividend	-24,726	-53,048	-85,467	-244,516
Net income	-1,561,891	324,619	-10,297,887	-7,681,139
EPS, Basic	-0.08	0.02	-0.55	-0.57
Avg. Shares Outstanding in period	20,581,041	14,849,127	18,847,515	13,565,453

Source: Company Form 10Q, SeeThruEquity Research

### Additional Notes:

- BSGM reported a loss of (\$0.08) per share in 3Q16, versus 0.02 in 3Q15. The company spend \$1.6mn in operating expenses, largely consisting of research and development and G&A.
- For the first three quarters of 2016, ended September 30, 2016, BSGM reported a loss of (\$0.55) per share, versus (\$0.57) per share in the year-ago period.
- BSGM did not report revenues in the period, which was expected given that the company's lead products have not been cleared for sale by the FDA.
- **Balance Sheet & Liquidity Overview:** BioSig ended 3Q16 with cash on hand of \$150,454 at September 30, 2016. The company used \$3.8mn of cash in operating activities in the first three quarters of 2016. We continue to see the balance sheet and liquidity as key items to watch for BioSig. The company filed an 8K in mid-December stating that it had raised \$2.4mn at \$1.50 per share, a premium to market prices. Management has stated that it is in the process of raising additional monies to support its 2017 development plans, including the 510(k) submission.

## MANAGEMENT TEAM

### **Gregory D. Cash, President, CEO, and Director**

Greg Cash is an experienced executive and a seasoned industry veteran. He has over 30 years of business experience and has been chief executive officer of several companies, both public and privately held, as well as run global business units of larger companies.

Prior to joining BioSig, Mr. Cash was President and CEO of Argent International, a life sciences consulting firm. Previous positions include President and Chief Executive Officer of NeuroTherm, Inc., President and Chief Executive Officer, as well as a director of HeartSine Technologies, Inc., President, Vascular Therapy and New Businesses for Sorin Group based in Milan, Italy, President and Chief Executive Officer and a director of Vasomedical, Inc. a NASDAQ traded public company, Corporate Vice President, Datascope Corporation, and President of its subsidiary, InterVascular, Inc., President and Chief Operating Officer of Eminent Technology Partners and Chief Executive Office of its subsidiary, Eminent Research Systems, Vice President and General Manager, Vascular Therapies, for U.S. Surgical Corporation and spent five years with Boston Scientific Corporation, ultimately as Vice President, Cardiology Sales and Marketing, Europe. He began his career at Medtronic, Inc., where he served 14 years in increasingly senior sales and marketing positions.

Mr. Cash has lived and worked as an expatriate in London, England, Hong Kong, Paris, France and Milan, Italy and speaks French, German and Italian. He holds a B.A. in International Marketing and Business Administration from the College of St. Thomas in St. Paul, Minnesota.

### **Kenneth L. Londoner, MBA, Executive Chairman and Director**

Mr. Londoner has served as our director since February 2009 and as our executive chairman since November 2013. Mr. Londoner founded BioSig Technologies, Inc. in February 2009. Mr. Londoner is the Managing Partner of Endicott Management Partners, LLC, a firm dedicated to assisting emerging growth companies in their corporate development and investing needs since 2004. From April 2007 to October 2009, Mr. Londoner was the executive vice president of NewCardio, Inc., a silicon valley based cardiac software company. Mr. Londoner also served as a Director and the architect for the turnaround at Alliqua BioMedical, Inc. (Nasdaq: ALQA) from May 2012 to March 2014. Mr. Londoner is a co-founder of Safe Ports Holdings, LLC, in Charleston, South Carolina, a port security and logistics company. Started in July 2005, the company built and sold an inland port development project to Dubai Ports World. The sale, in the fall of 2007, was for almost six times what investors had invested. Mr. Londoner is a member of Safe Ports Board of Directors. Mr. Londoner was the founder and managing partner of Red Coat Capital Management in New York. Founded in late 1996, the hedge fund (long/short equity strategy) grew from its initial base of \$ 2 million in assets to a peak of \$ 1.1 billion. Mr. Londoner started his investment career at J. & W. Seligman & Co., Inc., a leading institutional money management firm where he rose from research analyst to managing \$ 3.5 billion in mutual funds, pension funds, and international assets. He joined Seligman in 1991 and left in 1997. Mr. Londoner graduated from Lafayette College in 1989 with a degree in economics and finance and received his MBA from NYU's Stern School of Business in 1994, with a dual major in finance and management. Mr. Londoner just celebrated his 25th wedding anniversary and has four children. Mr. Londoner has been working with Lafayette College to develop and expand a summer internship program designed to provide undergraduate students with high value summer employment in leading growth industries in the U.S.

### **Jay Millerhagen, Vice President, Clinical Affairs**

Jay Millerhagen, Vice President of Clinical Affairs, has over 25 years of experience developing, evaluating and launching new medical technologies and therapies. Most recently, Mr. Millerhagen served as Vice President, Clinical Affairs and Market Development for RESPICARDIA, Inc., in Minnetonka, MN. At RESPICARDIA, he led clinical operations, staffing and site management leading to the pivotal IDE trial of the fully implantable ReMed System for the treatment of Central Sleep Apnea.

Prior to joining RESPICARDIA, Mr. Millerhagen served in positions of increasing responsibility at St. Jude Medical in St. Paul, MN. From 2011 to 2012, as Vice President, Clinical Affairs, he led a team of 20 in-house clinical personnel and a team of 22 field clinical engineers to execute a series of clinical studies targeted at addressing cardiac arrhythmias. He oversaw the team that completed enrollment in five major IDE (investigational device exemption) trials most of which

were completed several months ahead of schedule. From 2007 to 2010, Mr. Millerhagen served as Senior Director, Clinical Affairs. His team was the first to design, submit and secure approval of an IDE from the FDA for a novel open irrigated ablation catheter based indication for Atrial Fibrillation.

From 1989 to 2007, Mr. Millerhagen held senior positions at Boston Scientific Corporation. Joining the company as a Manager of New Product Planning, he co-authored a patent on a pacemaker based on hemodynamic performance. Promoted to Director, he oversaw Brady Marketing, Heart Failure Research and Development, Heart Failure Marketing and from 2004 to 2007, he served as Director, Business Alliance Marketing with industry giants Johnson & Johnson and GE Healthcare. During his tenure at Boston Scientific he directed numerous areas of cardiovascular health.

Mr. Millerhagen received his MBA from the University of St. Thomas, St. Paul, MN, earned an MS in Exercise Physiology from St. Cloud State University, St. Cloud, MN, and a BA in Physiology and Psychology from Concordia College, Moorhead, MN. He has been member of the Heart Rhythm Society (NASPE), the Heart Failure Society of America, and the American College of Sports Medicine.

#### **Steve Chaussy, Chief Financial Officer**

Mr. Chaussy has served as Biosig's Chief Financial Officer on a part time basis since May 2011. Since 2001, Mr. Chaussy has acted as a consultant for small publicly traded entities with a special emphasis towards SEC reporting and compliance; Mr. Chaussy provides consulting services both directly and through his wholly-owned entity, Anna & Co., Inc. Prior to 2001, Mr. Chaussy served as Chief Financial Officer for a large private distribution and wholesaling company, where he gained international experience. Mr. Chaussy is a graduate of Virginia Polytechnic Institute and State University and is a licensed certified public accountant in Virginia, California and Florida.

#### **Asher Holzer, Ph.D., Chief Scientific Officer**

Dr. Holzer was appointed Chief Scientific Officer of BioSig following years of service as a member of BioSig's Board of Directors. Dr. Holzer served as a director of InspireMD, Inc., an Israeli-based developer of a new stent platform, and served as that company's president from March 2011 until June 2012 and chairman from March 2011 until November 2011. In addition, Dr. Holzer co-founded InspireMD Ltd., the predecessor and later wholly-owned subsidiary of InspireMD, Inc., and served as its president and chairman of the board from April 2007 until June 2012. Previously, Dr. Holzer founded Adar Medical Ltd., an investment firm specializing in medical device startups, and served as its chief executive officer from 2002 through 2004. Dr. Holzer currently serves on the board of directors of Adar Medical Ltd., O.S.H.-IL The Israeli Society of Occupational Safety and Health Ltd., Theracoat Ltd., 2to3D Ltd., and S.P. Market Windows Cyprus. Dr. Holzer earned his Ph.D. in Applied Physics from the Hebrew University. Dr. Holzer is also an inventor and holder of numerous patents. Dr. Holzer brings to the board his more than 25 years of experience in advanced medical devices, as well as expertise covering a wide range of activities, including product development, clinical studies, regulatory affairs, market introduction and the financial aspects of the advance medical device business.

#### **Brian McLaughlin, Vice President, Corporate Finance and Investor Relations**

With over 19 years of financial experience, McLaughlin is a seasoned Wall Street veteran specializing in healthcare investments. During his tenure in the money management industry, McLaughlin held senior roles with some of the leading U.S. hedge funds. In that capacity, he built an extensive network of relationships that will bring tremendous value to BioSig. McLaughlin held senior executive positions in the hedge fund industry for over 13 years at Sigma Capital Mgt., SAC Capital Mgt., and the investment bank, JP Morgan & Co. At Ridgeback Capital, McLaughlin was president and chief operating officer managing over a billion dollars, specifically investing in the healthcare industry. McLaughlin received a Bachelor of Arts degree in Communications from Marist College in 1996.

## **About BioSig Technologies, Inc.**

BioSig Technologies is a medical device company that is developing a proprietary technology platform designed to improve the \$4 billion EP marketplace<sup>1</sup>. Led by a proven management team and a veteran, independent Board of Directors, Minneapolis-based BioSig Technologies is preparing to commercialize its PURE EP System.

The PURE EP™ System is a surface electrocardiogram and intracardiac multichannel signal acquisition and analysis system engineered to assist electrophysiologists in making clinical decisions in real-time by acquiring and displaying high-fidelity cardiac signal recordings and providing clarity of data which may be used to guide the electrophysiologists in identifying ablation targets - areas of tissue to treat that otherwise create a heart rhythm disturbance (arrhythmia).

Analysts forecast the global market for EP devices will grow at a 12.1 percent compound annual growth rate, from \$2.5 billion in 2012 to \$5.5 billion by 2019<sup>1</sup>, making it one of the fastest growing medical device segments. Just in the US, the number of Atrial Fibrillation (AF) and Ventricular Tachycardia (VT) arrhythmia ablations is forecast to grow at 10.5% from 2012 to 2017<sup>2</sup>.

BioSig has partnered with Minnetronix on technology development and is working toward a FDA 510(k) clearance for the PURE EP System. The Company has achieved proof of concept validation and tested its prototype at the University of California at Los Angeles (UCLA) Cardiac Arrhythmia Center; and, has performed pre-clinical studies at Mayo Clinic in Minnesota. Additionally, an Advanced Research Program at Mayo Clinic began in June 2016. The Company is also collaborating with other prestigious cardiac arrhythmia centers including Texas Cardiac Arrhythmia Institute, UH Case Medical Center in Cleveland, Ohio and Mount Sinai Medical Center in New York.

1) *Electrophysiology Devices Market - Global Industry Analysis, Size, Share, Growth, Trends and Forecast, 2013 – 2019*

2) *HRI 2013 "Global Opportunities in Medical Devices & Diagnostics" report; triangulation of multiple sources; \*AF includes left atrial tachycardia, left WPW, left atrial flutter.*



## Contact

Ajay Tandon  
SeeThruEquity  
[www.seethruequity.com](http://www.seethruequity.com)  
(646) 495-0939  
info@seethruequity.com

## Disclosure

This research report has been prepared and distributed by SeeThruEquity, LLC (“SeeThruEquity”) for informational purposes only and does not constitute an offer, solicitation or recommendation to acquire or dispose of any investment or to engage in any transaction. This report is based solely on publicly-available information about the company featured in this report which SeeThruEquity considers reliable, but SeeThruEquity does not represent it is accurate or complete, and it should not be relied upon as such. All information contained in this report is subject to change without notice. This report does not constitute a personal trading recommendation or take into account the particular investment objectives, financial situation or needs of an individual reader of this report, and does not provide all of the key elements for any reader to make an investment decision. Readers should consider whether any information in this report is suitable for their particular circumstances and, if appropriate, seek professional advice, including tax advice. This report contains “forward-looking statements” within the meaning of the Private Securities Litigation Reform Act of 1995 that involve risks and uncertainties, many of which are beyond the company’s control. Actual results could differ materially and adversely from those anticipated in such forward-looking statements as a result of certain industry, economic, regulatory or other factors.

SeeThruEquity is not a FINRA registered broker-dealer or investment adviser, does not provide investment banking or related financial advisory services and does not accept or receive fees or other compensation for preparing its research reports from the companies featured in these reports. SeeThruEquity has not been retained or hired by the company featured herein or by any affiliate of such company to prepare this report, and this report was not solicited, paid or sponsored by such company or any such affiliate. SeeThruEquity and/or its officers, directors or affiliates have in the past and may from time to time in the future receive compensation from companies featured in its reports for presenting at SeeThruEquity investor conferences, distributing press releases and performing certain other ancillary services. Such compensation is received on the basis of a fixed fee and made without regard to the opinions and conclusions in its research reports. SeeThruEquity and/or its affiliates may have a long equity position with respect to a non-controlling interest in the publicly-traded shares of companies featured in its reports.

SeeThruEquity’s professionals may provide verbal or written market commentary that reflects opinions that are contrary to the opinions expressed in this report. This report and any such commentary belong to SeeThruEquity and are not attributable to the company featured in its reports or other communications. The price and value of a company’s shares referred to in this report may fluctuate. Past performance by one company is not indicative of future results by that company or of any other company covered by a report prepared by SeeThruEquity. This report is being disseminated primarily electronically and, in some cases, in printed form. An electronic report is made simultaneously available to all recipients. The information contained in this report is not incorporated into the contents of our website and should be read independently thereof. Please refer to the Disclosures section of our website for additional details.