



# INTERFACE

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## President's Message

By Joseph Orr, PhD

I want personally, and on behalf of STA, thank Dr. Joan Spiegel for her great service to the Society as President during the past year. Joan did a wonderful job as President and presided over a year of fantastic meetings. Furthermore, she left the Society on sound financial footing.

I also want to thank all those who worked so hard to put together the wonderful Annual Meeting in Phoenix. Specifically, I want to thank Dr. Allan Simpao who, as Program Chair, arranged for three days of informative and thought provoking presentations. As always, Jane and Marie made sure that every detail was organized and that all of mechanics of the meeting went off without a hitch. I also want to thank our corporate sponsors at this year's meeting. I was impressed with the amount of interaction between attendees and sponsors. I hope that the interaction was positive for both. On one level, my interactions with some of the corporate sponsors at the meeting were as informative as the program.

I was especially impressed this year with the quality of the abstracts that were presented at the meeting. When STA was young, I sometimes felt that the STA Annual Meeting received lesser quality technology abstracts that might not have been accepted at the ASA meeting in October. More recently this has changed. As ASA has altered its abstract poster presentation format, it appears that presenters are saving their higher quality abstracts for the STA meeting. In my view, this only makes sense because at STA, posters are up for an extended period and true thought leaders take time to thoughtfully review and discuss the abstracts with the presenter. I encourage STA members to plan now to prepare exciting work to be presented at the 2016 STA Annual Meeting. In addition, as members, if you know of anesthesia technology research work going on at your institutions, please spread the word to your colleagues that

the Annual Meeting of the Society for Technology in Anesthesia provides a venue where their work will get a focused audience of true experts who will spend time to thoughtfully consider each abstract.

I am looking forward to progress at the STA during the coming year. I was impressed with the energy of the members and the willingness to serve that was demonstrated at the Board Meeting held in Phoenix on Saturday morning. I expect that as this energy translates into action, that STA will continue to progress.

I also want to make a plug for future meetings this year. STA is a co-sponsor of the IAMPOV Symposium to be held this October



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## Report from the Executive Director

By Jane Svinicki, CAE

### Managing STA into the Future

Every profession or industry has hot topics that are the focus of the members. For anesthesiologists currently the Perioperative Surgical Home (PSH) seems to be the hottest topic. For

the association management profession the hot topic right now is transparency.

For associations, transparency means operating in full view of the membership. For companies, transparency means operating in full view of the employees, customers and vendors. At Svinicki Association Management, Inc. (SAMI) we have transparency as one of our core values – “Integrity and transparency in relationships with clients.”

To maintain full transparency with our clients, SAMI wants to share some exciting news about our ownership. This year it became time to put in place a formal structure to insure the continuity of SAMI.

For 15 years Jennifer Rzepka and I have worked together at SAMI. Our relationship grew into one of equals, where we could discuss, support, disagree and generally lean on each other to run SAMI as partners. We have been operating as partners for a long time. Now, for the assurance of our clients, employees, customers and vendors, we are making it legal with a formal partnership agreement.

### President's Message *continued from page 1*

in Japan. For those interested in oxygenation, monitoring and ventilation, this is a great symposium and opportunity to represent STA internationally. I also look forward to a great Ty Smith dinner to be held in San Diego in conjunction with the ASA meeting in October.

This is a great time to be working in the field of anesthesia technology. A lot of great things are happening and there is a much to be done. I am proud to be part of STA while this is going on. This will be a great year for STA and hope to be able to contribute to our continued success and growth.

Sincerely

Joseph Orr, PhD  
STA President

Upon signing the agreement in early 2015, Jennifer and I each own 50% of SAMI. That is the only thing that is changing. We will continue to manage clients, staff and SAMI itself as we have done in the past, as partners. At the end of five years, the partnership agreement will guide us on the next steps for a smooth leadership transition at SAMI.

Be assured that my plan is to continue to work. Helping clients achieve success is what I enjoy doing. I plan to continue to work with many of you for a long time.

Looking towards the future, not the past, is my nature. I will work hard to make that future, the future of SAMI, an excellent one for our clients and staff. Thank you for your part in our past success and I will continue my efforts to make dynamic associations succeed.

Jane A. Svinicki, CAE  
Executive Director

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## Recap of the 2015 STA Annual Meeting

**Author:** James Szocik, MD, STA Communication Committee Chair

Once again, great weather, good company and good companies were to be found at the STA Annual Meeting.

Reflecting back on the meeting, as a historical perspective, the organization is reaching a new maturity. This maturity for me is evidenced by two sessions: one, on the surgical perioperative home and two, the AIMS (Anesthesia Information Management Systems) panel on “breaking up is hard to do”. As an organization, we were far ahead of the curve. Slides were shown from nearly 20 years ago with diagrams of a home to hospital back to home technological odyssey, giving me a sense

of prescient vision. The perils, pitfalls and benefits we foresaw years ago are now being discussed again, in the context of the perioperative home.

20 years ago we were trying to implement AIMS from various vendors in any form. Now we had an AIMS panel on “Breaking up is hard to do”...detailing long term planning for anesthesia software and data, as well as how to warehouse the treasure troves of perioperative data (that feeds into the surgical home and other health care entities) when your AIMS system is outdated or out of business. The mark of maturity is being able to transition between these developmental stages and survive. I am looking forward to the next 20 years of the STA!



Dr. Allan Simpao, 2015 Annual Meeting Program Chair, with keynote speaker Dr. Ted Shortliffe of Arizona State University.



Dr. Joan Spiegel, STA 2015 Past President, awarding Dr. Allan Simpao for his work as Annual Meeting Program Chair.



Dr. Jeffrey Feldman (right) introducing 2015 J.S. Gravenstein Award winner, Dr. Jeffrey Cooper, (left) to Annual Meeting attendees.



Dr. Thomas Hemmerling (right) congratulating 2015 Fresenius Grant recipient, Dr. Christian Petersen (left).

**2015 Annual Meeting Photos** continued on next page

**2015 Annual Meeting Photos** *continued from previous page*

*A panoramic view of the general session room.*



*Dr. Jorge Galvez, 2016 Annual Meeting Co-Chair, Dr. Mohamed Rehman, STA Past President and Dr. Allan Simpao, 2015 Annual Meeting Program Chair.*



*A view of the Annual Meeting exhibit hall.*



*Another view of the Annual Meeting exhibit hall.*



*Dr. Patrick McCormick, 2016 Annual Meeting Co-Chair, Christine Lee and Dr. James Philip, STA Past President, engaging in conversation at the Annual Meeting Friday night dinner.*



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## 2015 STA Abstract Winners

### Best Clinical Application

**“Using Electronic Medical Records Features – Are Hard Stops the Way to Improve Documentation?”**

Presenting Author: Luis Rodriguez, MD,  
University of Miami Miller School of Medicine

### Excellence in Technology

**“Development of a Device for Magnetically Guided Intubation”**

Presenting Author: Barrett Larson, MD  
Stanford University

## Using Electronic Medical Records Features – Are Hard Stops the Way to Improve Documentation?

**Presenting Author:** Luis I. Rodriguez, M.D.

**Co-Authors:** Keith Candiotti, M.D., David Lubarsky, M.D. M.B.A., David Rico, M.D., David Sinclair, M.D. M.B.A.

**Introduction:** The development and meaningful use of Anesthesia Information Systems (AIS) has increased over the past decade, improving timing and accuracy of data recording, compared to handwritten records (1,2,3). It is the anesthesiologists' ultimate responsibility to confirm the record's completeness and accuracy. For this reason, some AIMS have developed features to assure completeness through automatic monitoring alerts (4), messaging (4), or use of Hard-Stops (1); which prevents the record from being finalized before all critical information is completed.

**Methods:** The anesthesiologists of the University provide coverage at multiple centers with different AIMS. We retrospectively analyzed the data for all surgeries and documentation completeness in 3 random months (April-June-September 2014), at 2 different hospitals: Center A uses PICIS and does not allow for hard-stops and Center B, which uses INNOVIAN, and allows for hard-stops.

We measured completeness of documentation at 48 hours, based on 7 variables required by our department for documentation and billing compliance. These variables were: start of anesthesia care, end of anesthesia care, patient re-evaluated immediately prior to induction, attending present for induction, attending present for emergence, attending present for critical events and attending present during positioning.

Because hard-stops utilized in Center B do not allow the record to be printed or closed, we assumed 100% compliance for these 7 events at the end of each case and when reviewed. Further, we found no reports of cases still opened at 24 to 48 hours in Center B.

**Results:** The number of cases with completed documentation in April 2014 was 1265/1327 (95.3%) in hospital A vs. 992 (100%) patients in hospital B. In June 2014, the number of cases with completed documentation were 1255/1317 (95.3%) in hospital A vs. 938 (100%) patients in hospital B. The number of cases with completed documentation in September 2014 were 1232/1279 (96.3%) in hospital A vs. 976 (100%) patients in hospital B.

**Conclusion:** As the tendency to implement AIMS increases, we must consider the different reporting capabilities and features such as hard-stops that each vendor offers, as this has implications for departments and billing compliance offices. Driscoll et al. stated, “An ideal AIMS should have the ability to detect the absence of essential information” (1).

We compared the use of hard-stops for billing and documentation completeness between 2 different centers with different AIMS, but used by the same group of providers. Although >95% compliance after 48 hours might be considered adequate, the implications for the billing department are important. Being able to customize an AIMS to a center's needs is important, and the value of knowing that anesthesia records are 100% compliant before “case closure” is critical. Ultimately, eliminating errors and missing information, improving billing revenue and enhancing anesthesia performance are all desirable results.

### **References:**

1. Anesth Analg 2007;104:1454-61
2. AANA J 2001;69:407-10
3. Can J Anaesth 1999;46:122-8
4. Anesth Analg 2006;103:390-5



## Development of a Device for Magnetically Guided Intubation

*Presenting Author: Barrett Larson, M.D., Stanford University*

**Introduction:** Although direct laryngoscopy is a reliable method for endotracheal intubation, there are situations when direct visualization of the vocal cords may be difficult or impossible. For example, if blood or gastric secretions have compromised the airway, it may be impossible to visualize the vocal cords using any optical means. Another method of endotracheal intubation involves using a lighted stylet. The light transilluminates through the tissues of the anterior neck to help guide the endotracheal tube into the trachea. This technique can also be useful in the setting of suspected or known neck injury, where neck manipulation should be avoided. Despite its benefits, the transillumination technique does have some limitations, which include 1) need for a dark or dimly lit environment, 2) impaired transillumination in obese patients with significant redundant neck tissue, and 3) impaired transillumination in patients with darkly pigmented skin. To overcome these limitations, a device was developed that detects and visually represents the location of a magnetic intubation stylet and helps guide the stylet into the trachea via magnetic field sensing.

**Methods:** A prototype device was designed, built, and tested. The device was developed on a flexible PCB, such that the apparatus could easily conform around the anterior neck. The device has an array of Hall sensors capable of detecting the magnetic field produced by an external magnet that is incorporated into the tip of the intubation stylet. An array of accelerometers is also incorporated into the device, such that the neck circumference (and thus expected tracheal depth) could be determined and the device could auto-calibrate in real-time. A microcontroller aggregated sensor data and controlled a series of LEDs that visually represented the location and depth of the magnetic intubation stylet. The device was tested on an intubation mannequin.

**Results:** A prototype device was successfully developed and tested in a simulation environment. The visual LED-targeting array accurately represented the 3-dimensional location of the intubation stylet. The intubation stylet could be guided into the trachea using the magnetic guidance system. Ambient room lighting, skin tone, or neck size did not affect guidance.

**Conclusion:** A novel method for endotracheal intubation using magnetic guidance was developed. This technique potentially

offers several advantages over conventional intubation techniques, which include: 1) insensitive to blood or other fluids in the airway, 2) neck manipulation is not required, 3) not affected by ambient room lighting, 4) not affected by skin tone, and 5) not affected by neck size. Future studies will aim to optimize the firmware and incorporate additional sensing modalities to further increase the reliability of the guidance system.



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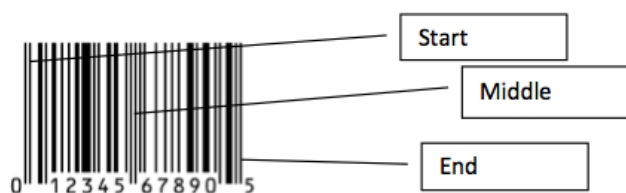


## QR Codes and Medicine

By James Szocik, MD, STA Communication Committee Chair

### History

QR codes were developed by DensoWave, a subsidiary of Toyota, in 1994, for use in tracking auto parts. They are an out-growth of the “bar code”, a machine readable type of information, which first saw commercial use in 1974 as the Universal Product Code (UPC). This original bar code, now known as UPC-A, can code up to 12 digits (11 digits if the last is used as a checksum for reading errors). The original scanners read the reflectance pattern from the code, digitized the signal, and then looked up the number in a table. So when you use the “price check” feature at the local quickie mart, the price info is not contained in the bar code, only the item identification number.



Sample UPC code

### UPC Anatomy

A complete UPC-A includes 95 modules: the 84 modules for the digits (L and R) combined with 11 modules for the start, middle, and end (S, M, and E) patterns. The start and end patterns are three modules wide (bar-space-bar). The middle pattern is five modules wide and uses the pattern space-bar-space-bar-space. In addition, a UPC symbol requires a quiet zone at the start and end.

UPC-B is a subset of this code used for coding drugs. Here is an example:



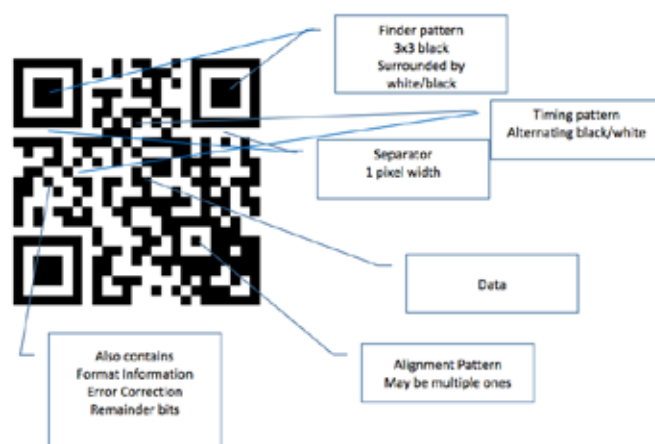
Barcode technology incorporated into the medication administration system has been demonstrated to decrease, but not eliminate, errors. [NEJM 362;18. May 6, 2000, pp 1698-1707]. Transcription errors were most markedly reduced, but timing and other errors persisted. More recently, non-traditional categories of error have been found through the use of BCMA (Bar coded medication administration) [J Patient Safety 2010

Jun;6(2):115-20]. Errors have been shown to decrease in an acute care setting (Emergency Department) as well [Acad Emerg Med 2013 Aug;20(8):801-6].




Technically a QR code is a 2 dimensional machine readable code, with up to 177x177 squares.

In the standard format, this yields 4296 alphanumeric characters, without error correction.

### The Anatomy of a QR code



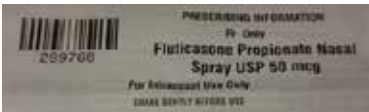
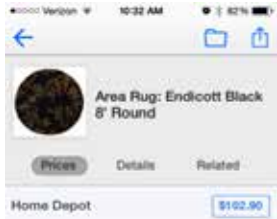


Examples of various codes...

The “Code”	What it “says”
	<a href="http://www.stahq.org/">http://www.stahq.org/</a>
Pt Name Band 	
Pt Name Band 	137577154 Bar code only has the number, no other info

QR Codes and Medicine continued on next page

QR Codes and Medicine *continued from previous page*

<p>Pt Q code</p> 	<p>W1   000000012   137577 154   Big   Bird   1/1/1952   M   AC137577154 The QR code has the pt number, name, date of birth and other info as well. Note: not a true QR code by anatomy</p>
<p>Bar Code from Medication Box</p> 	<p>Fluticasone Propionate nasal spray Find prices with the QR Reader app qr://bar- code=0360505082919</p>
<p>Bar code from package insert</p> 	<p>Area Rug: Endicott Black 8' Round Find prices with the QR Reader app qr://bar- code=289768</p> 

All code reading done by iPhone 4s running QRReader software by Tap-Media, LTD. The last image highlights a hazard of "codes." The machine readable look up may find the wrong item.

QR (and other machine readable 2 dimensional codes) are likely to remain a part of our medical world. They will be used to identify patient, drugs, equipment and track their use. With the ability to generate your own QR code, individual hospitals can create local applications of this very flexible technology.

## Useful URL's

- [http://en.wikipedia.org/wiki/Universal\\_Product\\_Code](http://en.wikipedia.org/wiki/Universal_Product_Code)
- [http://en.wikipedia.org/wiki/National\\_Drug\\_Code](http://en.wikipedia.org/wiki/National_Drug_Code)
- [http://www.scholarpedia.org/article/Bar\\_code\\_scanning](http://www.scholarpedia.org/article/Bar_code_scanning)
- <http://www.carolinabarcode.com/how-barcode-scanners-work-a-69.html>
- <http://qrcode.meetheed.com/question14.php?s=s>
- <http://www.qr-code-generator.com/>

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## 2015 Engineering Challenge Recap

By Jeff E Mandel MD, MS, Assistant Professor of Anesthesiology & Critical Care, Perelman School of Medicine at the University of Pennsylvania, Philadelphia, PA

The STA Engineering Challenge has been a regular feature of the Annual Meeting. The challenge is open to trainees - engineering students, medical students, resident and fellows, and poses a problem that uses engineering to solve a clinical problem.

This year's challenge was to use a smart watch to devise a system that gave a score for the effort associated with intubation that could distinguish a difficult intubation from an easy one.

We had two entrants - Hassanpour Ali MD, an anesthesia resident at Temple University, Philadelphia, and Kyle Burk, a Biomedical Engineering undergraduate from University of Utah. Both entrants had interesting approaches; Kyle included changes in heart rate, Hassanpour looked at higher frequency components of wrist motion. Two FDA staff members were present; we had a spirited discussion on what aspects of these devices would be regulated medical devices.

After some deliberation by the attendees, Dr. Ali was judged the winner; both entrants will be awarded Apple Watches (when shipping). We hope to see posters on clinical trial results from both of our entrants at future meetings!



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## Upcoming Events

STA Ty Smith Dinner  
Sunday, October 25, 2015  
6:00-9:00pm

Location: To Be Announced  
San Diego, California

More Information on [www.stahq.org](http://www.stahq.org)

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