A Primer on How to Create a Visual Abstract

December 2016
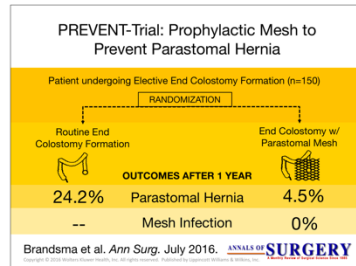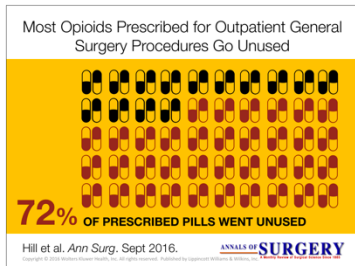
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WHAT IS A VISUAL ABSTRACT?

Simply put, a *visual abstract* is a visual summary of the information contained within an abstract. Similar to the actual text abstract of a research article, it is meant to convey the key the findings of the article in a shorter format.


It is just as important to say what the Visual Abstract is NOT. A visual abstract is not a substitute for reading the article and does not contain all the details of an article. The goal of a visual abstract is to inform a potential reader of the key findings in an article to help them decide if they want to proceed in reading the entire article. Just as any single article should not change one's practice, a visual abstract *alone* should not influence clinical decision making or opinion about the paper.

WHY CREATE ONE?

Authors and publishers have an opportunity to share their research to ultimately improve patient care. In fact, many would argue we also have an *obligation* to make our work as accessible as possible, without compromising the quality of the message. I created the visual abstract concept to fulfill this duty, and help efficiently disseminate the best of science to a broad audience.
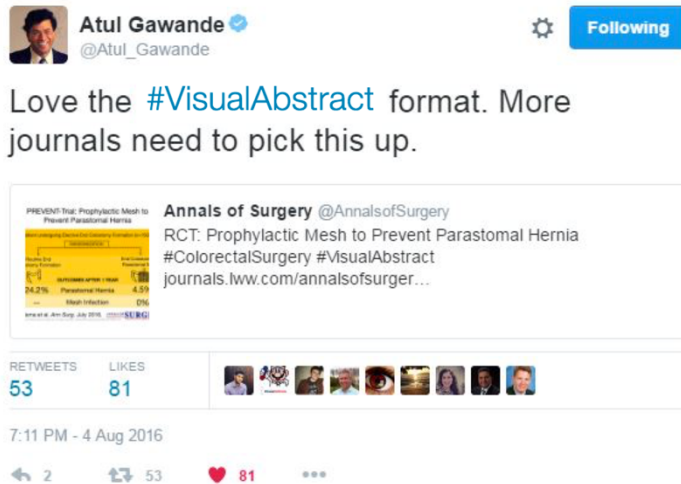
In our first few months at *Annals of Surgery,* the use of visual abstracts has been transformative. Early data (from our prospective, case-control matched study) indicates that articles with a visual abstract get five times more exposure, and the actual full article is visited twice as often. In short, if you're serious about disseminating your research, the use of a visual abstract is a valuable tool to have in your kit.

EMBRACING SOME DESIGN PRINCIPLES

An effective visual abstract has a clear message. You will want to embrace some principles of design when creating your visual abstract. These include:

Focus on the user experience*.* The process of design starts and always returns to the user experience. Always keep in mind, *"What does my audience on Twitter want to know about scientific research?"*

Clarity of Purpose*.* Particularly within complex articles, you want to spend time narrowing the key message down to what you want to deliver. *Some* simplification of presentation may be necessary to establish a clear focus.

Rapid Prototyping. There are infinite ways to visually display research*.* Your 1st, 2nd or 10th visual abstract won't be your best one. You will improve significantly by rapidly trying new formats and seeing what works!

Iterative Improvement. Rather than ask, "Is it perfect?" design thinking focuses on, "What is the next step to make it partially better?" You will significantly improve by soliciting feedback and studying other designs.
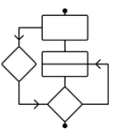
Thoughtful Restraint. Prioritize the key message over completeness. Sure, having every secondary endpoint and every limitation of the article in the visual abstract is ideal to give context, but this can significantly distract from the key message. In the case of visual abstracts, more is not always better.

Relevant Creativity*.* Thinking outside the box can be valuable, but ultimately needs to be grounded in the desired outcome. Experimenting "just to be different" isn't always effective. You should frequently balance your design creativity with *thoughtful restraint* and *clarity of purpose.*

STARTING WITH A SOFTWARE

While the work can be done with expensive software (e.g. Adobe Photoshop Suite), most (or even all of it) can be done in Microsoft PowerPoint.

If you have a higher end design taste and want to create things more sophisticated than *Paint* allows, try *Pixlr (*https://pixlr.com/editor/) a free online image editor.

COMPONENT OF AN EFFECTIVE VISUAL ABSTRACT

Visual abstracts follow the general layout show here:
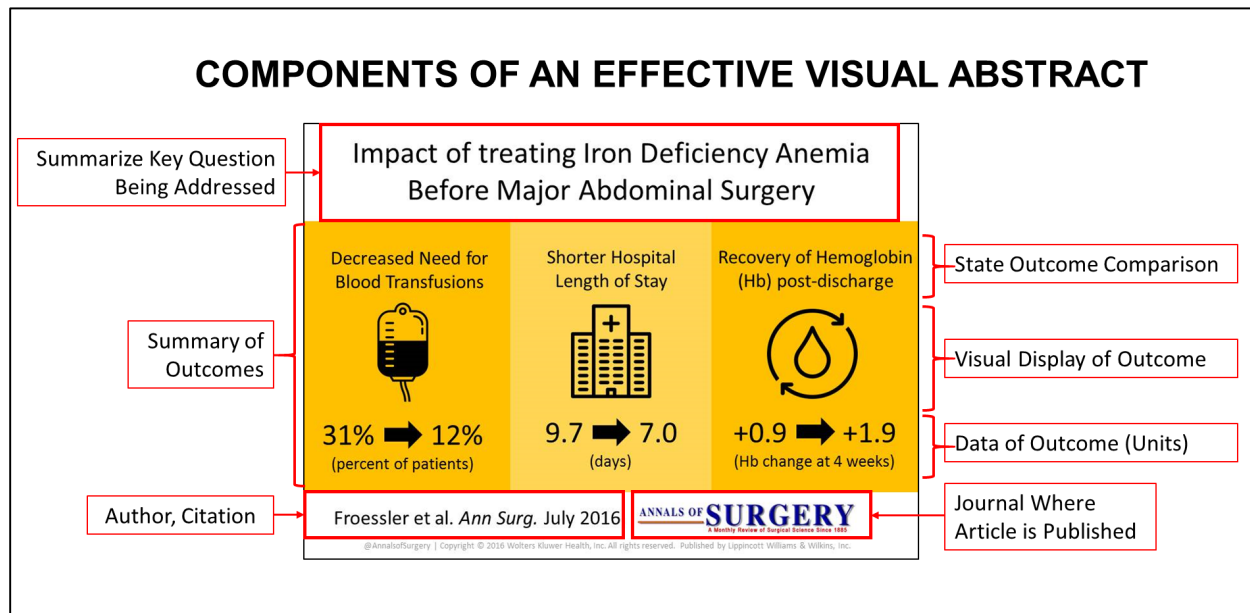
Key components of the visual abstract include:

<u>Summarize Key Question Being Addressed</u>: This usually comes from the title of the article or a heading of key figure. Keep it short and clear.

<u>Summary of Outcomes</u>: You will need to spend time thinking about outcomes you want to present. Most articles have many more than 3, so you'll have to prioritize.

<u>Author, Citation:</u> Always include at least the first author's name and year of publication.

<u>State Outcome Comparison:</u> A short phrase that clearly states the outcome with the respect to groups being compared. For example, "Decreased Need for Blood Transfusions" is easier to follow than simply, "Blood Transfusions." As much as possible, you should use the same prose used in the article for consistency.

<u>Visual Display of Outcome:</u> You will want a visual that reflects the outcome you're describing. (More on this below – "Making it Visual.")
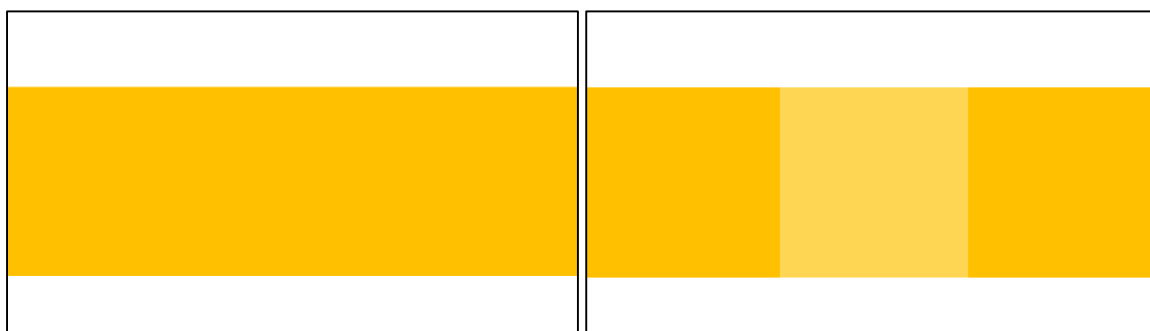
<u>Data of Outcome (Units):</u> In addition to stating the outcome, you will want to give the numeric representation. Be sure to include the units.

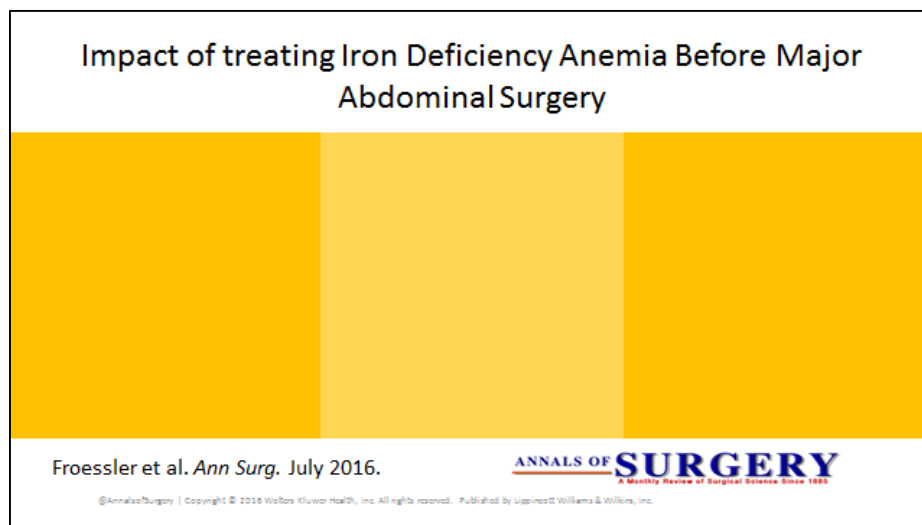**ACTUAL PROCESS OF CREATING A VISUAL ABSTRACT**

The following steps in this order can help you create a simple visual abstract:

Step 1: Choose an Article. Choose an article and spend time identifying the key message is that you want you convey. Pull out the key outcomes.

Step 2: Create Your Visual Fields. There are many ways to do this, but colored boxes can be quite easy and helpful.

Step 3: Add Author, Journal and Title. Starting filling in some of the essential information.

Impact of treating Iron Deficiency Anemia Before Major Abdominal Surgery

Froessler et al. *Ann Surg.* July 2016.

ANNALS OF **SURGERY**
A Monthly Review of Surgical Science Since 1885

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Step 4: Layout Your Outcomes. Describe the outcomes across the top in short phrases with comparative phrases inside of text boxes.
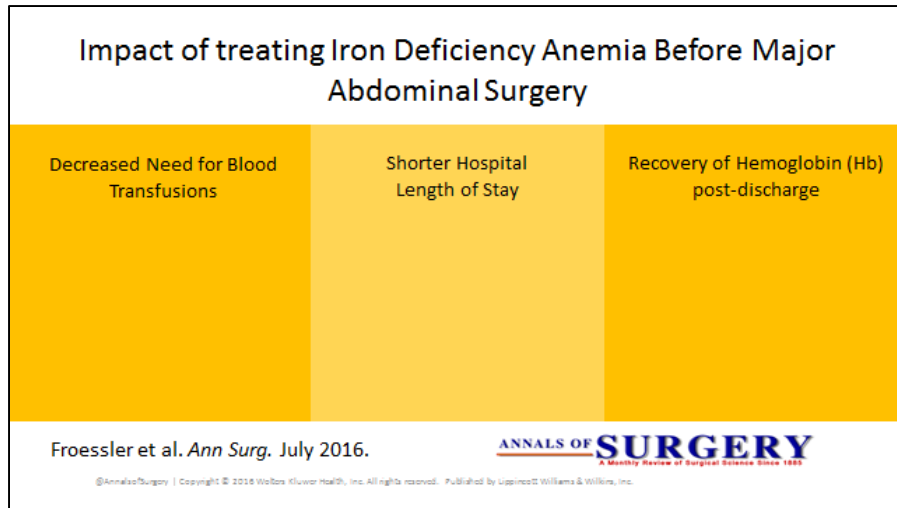
Step 5: Add in Values for Each Outcome. Add in the numeric values of each outcome, including the units.
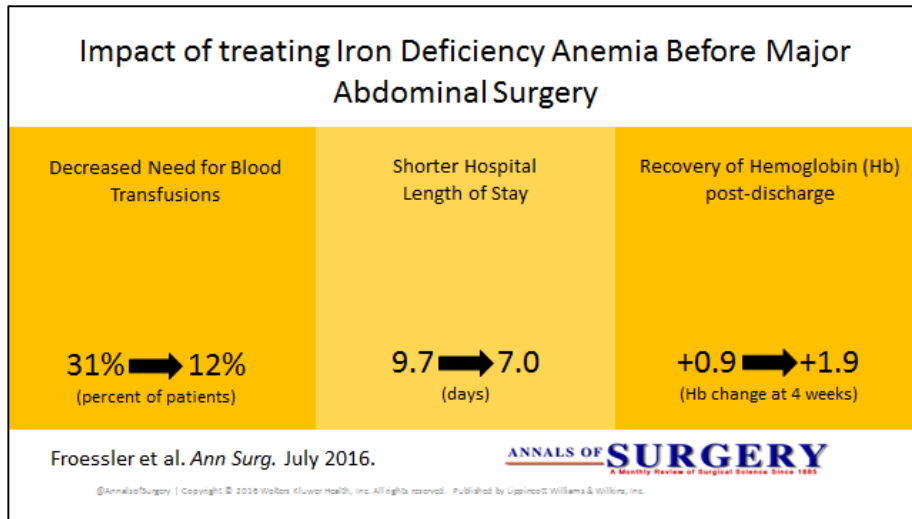
Step 6: Add Visuals. This is arguably the hardest part for most people, and an entire section ("Making It Visual") is dedicated to it below. It is CRUCIAL that you do not use images for which you do not have permissions or rights.
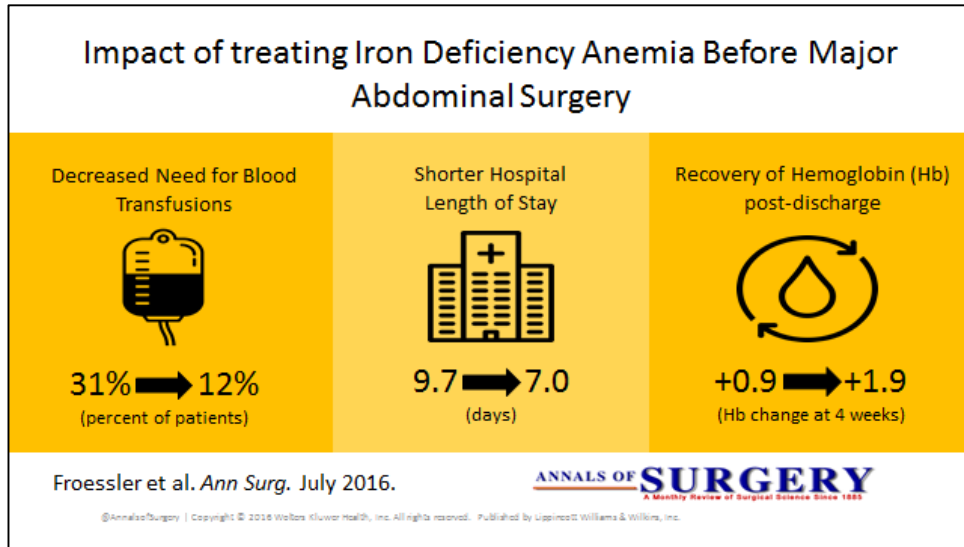

Impact of treating Iron Deficiency Anemia Before Major Abdominal Surgery

Decreased Need for Blood Transfusions	Shorter Hospital Length of Stay	Recovery of Hemoglobin (Hb) post-discharge
31% ➡ 12% (percent of patients)	9.7 ➡ 7.0 (days)	+0.9 ➡ +1.9 (Hb change at 4 weeks)

Froessler et al. *Ann Surg.* July 2016.

Step 7: Export your File. You will want to save the file as a JPEG of other image file to make it easily usable for social media. Be sure to proof read and double check all your outcomes so that they are consistent with the article. If the methods (e.g. randomized trial, retrospective review) are not clear in the visual abstract, be sure to include it in the text of the Tweet.

CHOOSING A LAYOUT

The visual display of outcomes can be achieved in multiple formats depending on the number of outcomes being described. Consider these additional layout options for 1, 2 or 3 outcomes.
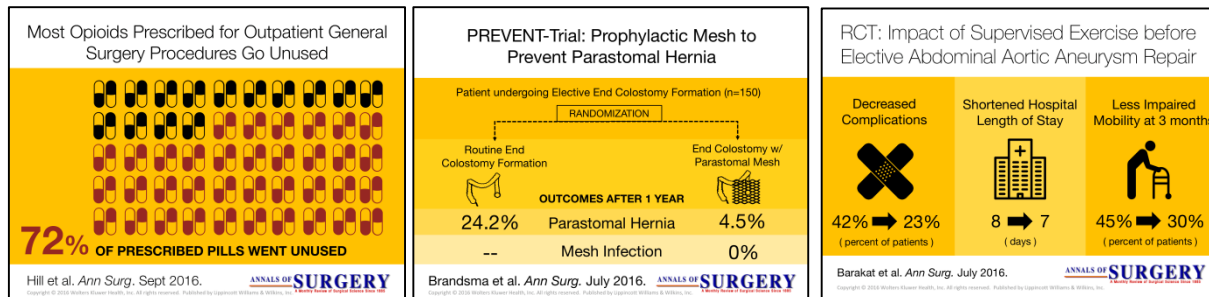
You can follow the hashtag #VisualAbstract on Twitter to find other new layouts.

#VisualAbstract   @andrewmibrahim

MAKING IT VISUAL

Here is where most people get stuck. They choose an article, they narrow down to a key message, and they pull out the key outcomes…but can't seem to make it visual!

Here are some common areas people get stuck and how to get around them.

Finding Images. There are a number of image banks on the internet, some of which are free to use. If you do visual presentations often enough, you may consider purchasing a subscription to access higher end icons (e.g. Shutterstock, Getty Images, Noun Project.) In some cases, you may need to create the icon yourself or collaborate with a graphic designer.

Finding the Right Images. When choosing an image, people often choose the wrong one. You should plan to "rapidly prototype" multiple iterations of your visual abstract with different audiences of your peers before choosing the final lay out.

More on Choosing the Right Images. While there is no clear "visual style" for academic journals, I have found that solid colored "icons" have the strongest professional appeal over cartoon-like images. While ultimately up to you, I would encourage sticking with solid color icons.

Copyright Issues. Just because an image is on the internet, does not mean it is free to use. You **MUST** make sure that you have copyright permission to use the images. This point cannot be overemphasized enough. To avoid this problem, either use the copyright filter during your image search or subscribe to an icon image bank.

USING TWITTER TO DISSEMINATE YOUR VISUAL ABSTRACT

Once you have created your visual abstract, you will need a plan to disseminate it.

Twitter is a common social media tool used by nearly every academic journal to disseminate research articles. You should plan to create your own account as well. In your tweet, you should include a link to the article.

You may amplify the dissemination of your Visual Abstract by 'tagging' other Twitter accounts in the Tweet. This can include the article authors, authors' institution(s) and journal publisher.

GET SERIOUS ABOUT IMPROVEMENT

Hopefully creating a visual abstract is not a one off project for you, and you plan to do it a few times. If that is the case, you will want to make an effort to track your progress. Twitter itself will allow you to follow dissemination statistics, as will Symplur (for hashtags) and Altmetric.

Common "outcomes" used to follow tweets include:
Impressions. The number of times a tweet is seen on Twitter.

Retweets. The number of times a tweet is shared.

Link Clicks. The number of times the link in the tweet is clicked (in this context, it's a surrogate of how many times people go to article webpage.)

FINAL COMMENTS

Opportunity and Responsibility. I am thrilled that you are reading this because you want to disseminate the best of research science. Visual data is much easier to consume than written text, and the use of social media has enormous potential to reach an incredibly broad audience. Thus, makers of visual abstracts carry a duty to use it responsibly and reflect *only* what is in the research article.

Raising All Boats. The science of dissemination research through social media is still quite new, and we are learning all the time about best practices. Please followed the precedent of this open source primer—share your advances and advice on how to best disseminate important research. Please email me (iandrew@umich.edu) any suggestions to be included in the next version of this primer.

ACKNOWLEDGEMENTS
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