

A picture is worth a thousand words

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Abstract

As modern medical writers, we face a changing communication landscape greatly altered by the arrival of the internet and the rise of social media. This article provides insights on how to keep pace and what options you have to make your written content more visually attractive. Graphical abstracts or infographics are effective visuals to capture attention, enhance comprehension, and increase information recall. Online tools like Mind the Graph or Piktochart provide a great base to get you started in the creation of your own powerful visuals without having to involve a graphic designer. The importance of promoting content, e.g., through social media, is highlighted, as this will help you to attract and reach your target audience in the crowded online space packed with information competing for attention.

It's no secret that humans are visual creatures. Since the dawn of time, we have communicated visually – drawing cave paintings to tell stories, using symbols to share knowledge, and painting pictures to express beliefs.

The human brain thinks in pictures. Unlike text, which must be scanned and decoded character by character, our visual system can process multiple images simultaneously. Information presented in pictures and images can be absorbed and understood better, a phenomenon known as the Picture Superiority Effect.¹ Recognition tests have shown that the human brain can remember more than 2000 pictures with at least 90% accuracy, even with short periods of presentation times.²

As medical writers, communicators, and

marketers, we have a limited time in which to convey our message to our audience. Understanding the way humans process information can be the key to ensuring our messages are absorbed and understood.

Additionally, over the last few decades, a new phenomenon has been impacting the way the brain recognises and interprets data: the internet. It has not only revolutionised the way we find information, but it has also altered the way we learn.

The internet has reshaped how we seek, process, and retain information

Over the past two decades, a substantial body of work has investigated the impact of the internet on our brains and cognitive processes. Study after study has shown that the internet has

unequivocally reshaped human cognition.³

Carr (2011) stated, that in terms of information processing, we are shifting towards a shallow mode of learning characterised by quick scanning, reduced contemplation, and decreased information retention.⁴ Today's multifaceted stream of incoming information triggers and demands attention switching and multi-tasking rather than a sustained focus.⁵ These fundamental changes to cognition and information processing have accelerated the need for a more visual approach to communication. The scientific and medical communication landscape are no exception, your content has to stand out – visually – to cut through the noise.

Medical writers have many options to visually adapt their content accordingly. Examples could be to use more bullet points to break up the text and to present more data in clear tables and charts. Text could also be replaced through

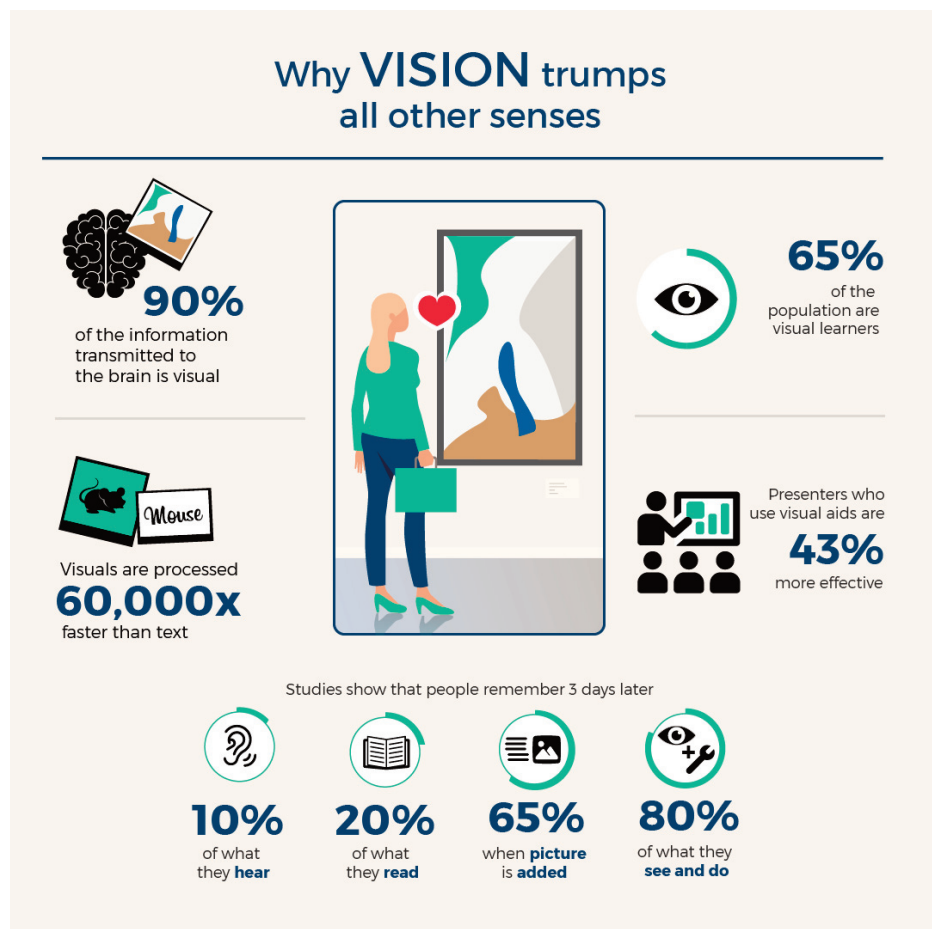


Figure 1. Visualisation of key facts on how our brain reacts to visuals



Martin – A picture is worth a thousand words

illustrated graphical summaries. Where appropriate, the use of symbols or icons can render content more visually attractive and also facilitate information retention.

Comprehensive documents that mostly comprise of text (e.g., regulatory documents) can also be complemented with graphical outlines or other visualisations to provide better orientation to the reader. However, in many cases, this may require authorities to make official adaptations of guidelines and instructions on how to prepare such documents.

The scientific communications marketplace is changing

Because of its open-source nature, the world wide web fosters exponential “scientific information proliferation”. Without being held to any measure of scientific scrutiny, such as peer review or empirical data, online publishers are able to create digital journals that are freely accessible to the public. Not only does this lead to a crowded information landscape with higher competition for audience interest, but it also becomes challenging for consumers to find credible information on the topic of interest. At the same time, promotion and marketing become vital to the success of online journals and libraries, as they can only survive if they are growing their audience and reputation.

New digital channels such as LinkedIn, Facebook, and Twitter have emerged as attractive communication and promotion vehicles. However, and this is not to be neglected, these channels are subject to algorithms that make particular content available based on previous user activity. This reinforces the need to capture attention, stand out from the noise, and prompt engagement.

In today’s digital landscape, how scientists communicate and display their work will determine, to a significant extent, how their findings are received. It is no longer enough to generate new insights or produce ground-breaking research and to publish it. Today’s medical

findings and healthcare content must be packaged in an engaging and attention-grabbing format. This is where visuals become paramount.

The visual toolbox

When we think about suitable visualisations it is important to remember that there are different types of visual communication. Scientific writers may already be familiar with the concept of data visualisation, but a growing trend taking over today’s marketplace is visual storytelling.

Data visualisation refers to the practice of designing complex data or processes into clear, aesthetically pleasing diagrams, charts, or maps to help the audience better understand and analyse the information presented. The idea of visual storytelling is to guide the viewer to a conclusion based on an introductory statement or thesis. The world of visual storytelling offers a plethora of creative options including videos, quirky GIFs, memes, interactive quizzes, and much more. Each has its benefits, drawbacks and anticipated outcomes to suit various objectives.

For scientific medical content, two visual storytelling formats are especially attractive: graphical abstracts and infographics.

Graphical abstracts

The goal of a graphical abstract, a relatively new section to many publication formats, is to provide a single, concise, pictorial summary of the main findings. More and more publishers now require graphical abstracts to make primary scientific findings easier to understand and accessible for in- and out-of-domain researchers, as well as wider audiences such as students, journalists, or members of the public. Importantly, graphical abstracts are thought to be an addition to and not a replacement for the classical way of publishing research.

Elsevier outlines, that graphical abstracts should “allow readers to quickly gain an understanding of the main take-home message of the paper and are intended to encourage browsing, promote interdisciplinary scholarship, and help

readers identify more quickly which papers are most relevant to their research interests”.⁶ With CellPress, Elsevier introduced a new approach to structuring the traditional linear sections of a printed research article into an online format that is integrated, linked, and easy to navigate through tabs. The landing page of each article is complemented with a graphical abstract that provides a quickly reviewable visual summary, bullet-pointed article highlights, and keywords, all with the goal of enhancing article presentation.

For some writers, graphical abstracts may initially seem like extra work for little reward. Consequently, many solely consist of extended figures from a paper or display a summary of a conclusion. However, graphical abstracts have myriad benefits when they have been created as a compelling visual summary of the research and main findings. When searching for topics online, they are displayed in the search results pages (e.g., in an image search in Google) or appear beside the title of the paper (e.g., Science Direct), capturing the attention of the reader. This helps increase visibility and can drive web traffic to an author’s research. Moreover, graphical abstracts are perfect to share on social media to promote research. Ultimately, their use may lead to more interest in an author’s work, more citations in other publications, and possibly greater recognition. Their effective, strategic use may even encompass new funding possibilities and new collaborations.

Three examples of good graphical abstracts:

Great examples of clear, self-explanatory graphical summaries of research papers are presented in Figure 2. Each chosen illustration is able to perfectly summarise the topic of research and materials and methods used, as well as outline the core findings. The information given adheres to the principles of good design, guiding the eye through the data in a clear and logical order.

In the future, one hopes that graphical abstracts and meaningful visuals will become

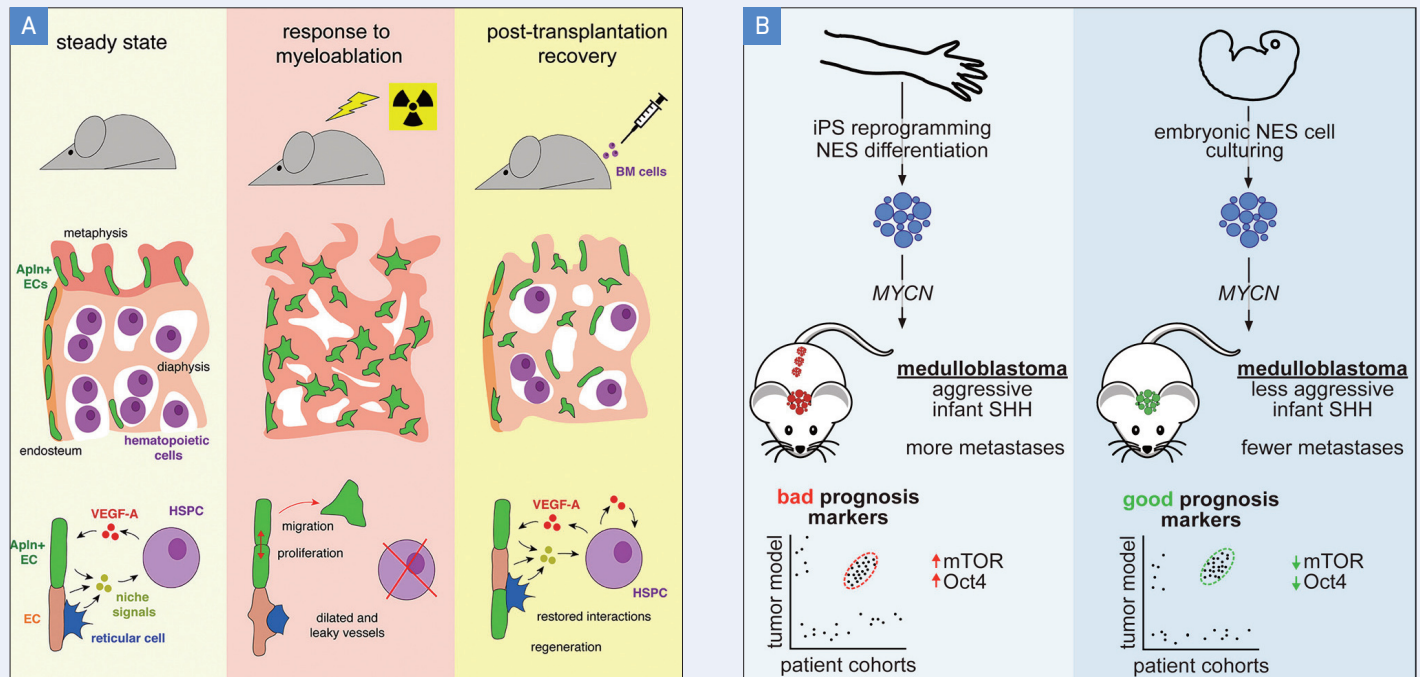


Figure 2. Examples of compelling, clear graphical abstracts from Elsevier CellPress

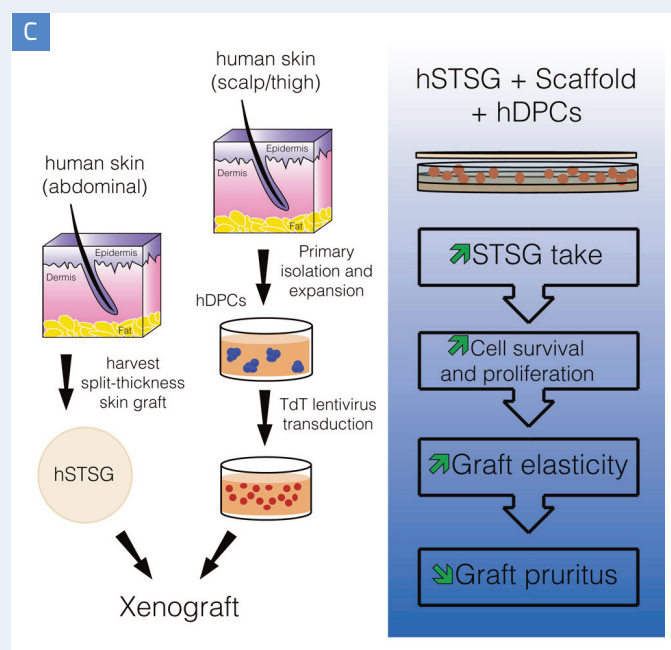
Figure 2A shows how hematopoietic cells, lost in response to irradiation and other treatments, trigger vessel dilation, permeability, and endothelial cell (EC) proliferation. It further shows transplanting hematopoietic stem and progenitor cells (HSPCs) increases the fraction of Apln⁺ ECs and promotes normalisation of the bone vasculature in response to VEGF-A. The abstract clearly depicts all elements of the process and findings and is nearly self-explanatory.

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Figure 2B demonstrates the underlying mechanisms of how human iPSC-derived or primary neuroepithelial stem cells can be transformed by MYCN and how that drives infant SHH medulloblastoma. It shows a suitable model (embryonic NES cell culturing) and that mTOR and Oct4 inhibition is efficient resulting in fewer metastases in just one image.

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Figure 2C shows the complete process and detailed outcome of in-vitro isolation and expansion of dermal progenitor cells (DPC) from human skin. A DPC transplant graft combined with a scaffold improves split-thickness skin grafting (STSG), cell survival and proliferation, graft elasticity and limits graft pruritus. Reproduced with permission from [https://www.cell.com/stem-cell-reports/fulltext/S2213-6711\(19\)30372-8](https://www.cell.com/stem-cell-reports/fulltext/S2213-6711(19)30372-8).



more and more prominent in a publication environment still dominated by traditional print. This includes adapting text-based search tools like PubMed and Google Scholar to show visuals in search results. It is important to leverage the potential of online dissemination of research results for all life science disciplines by adapting publication practices to an already changed communication landscape.

Infographics

Another compelling option to disseminate scientific medical information is an infographic. According to the *Oxford English Dictionary*, an infographic (or information graphic) is “a visual representation of information or data”.

In contrast to graphical abstracts, which aim to summarise the full content of a study or research paper, infographics focus on painting a more in-depth picture of a complex topic or fact. They can be used to help capture attention, enhance comprehension, and increase information recall.

Infographics have many digital benefits and have maintained their popularity over the last few years. They can contain links or backlinks and can be optimised for search engines to improve website rankings. They are easily shareable on social media and can be repurposed across different communication channels.

Infographics applied in healthcare

In addition to presenting scientific research and data, infographics can be used in many healthcare communications:

- Patient information and education – disease information/management, disease prevention campaigns, health behaviour change campaigns
- Procedural explanations – patient information explaining hospital entry and exit, treatment procedures, post-treatment recommendations, rehabilitation schemes, medication adherence, etc.
- Educational materials for care settings – for students, nurses, physicians, pharmacists, physical therapists, etc.
- Industry information – product explanations, procedures, and product instructions for med tech, pharma, or laboratories
- Wider use – information about patient organisations, non-profits, health insurance

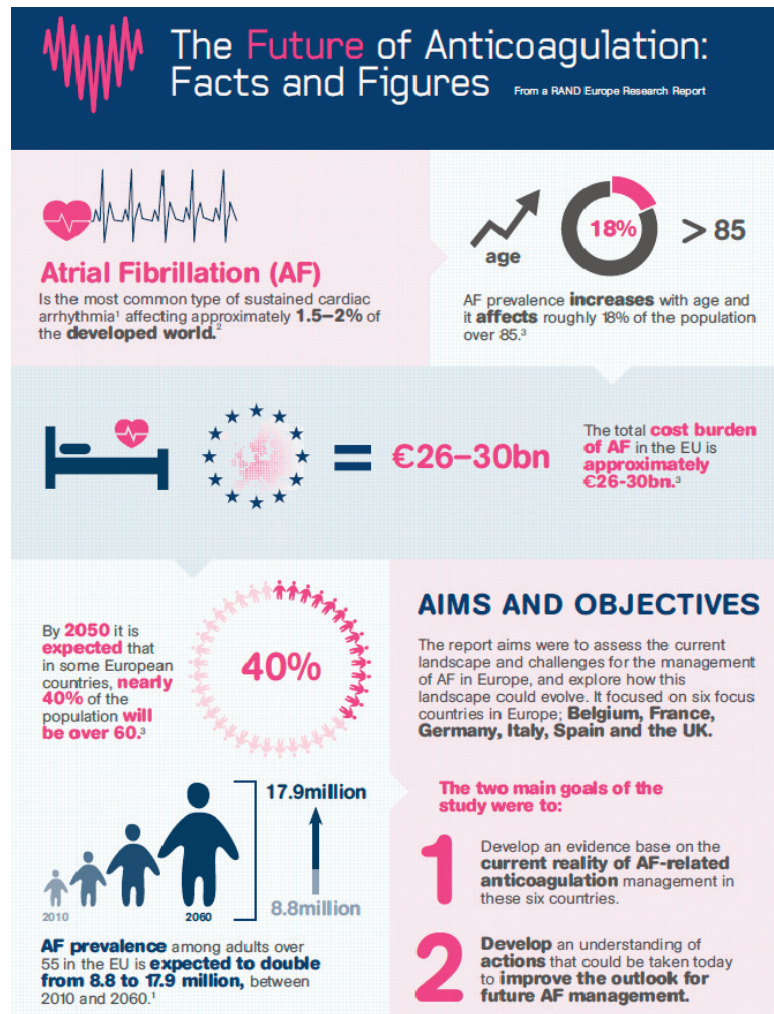


Figure 3. Screenshot of *The Future of Anticoagulation: Fact and Figures*

Reproduced with permission from RAND. Find the complete infographic here:

<https://www.rand.org/pubs/infographics/IG122.html>.

Three examples of good infographics

The examples selected in Figures 3, 4, and 5 break down a comprehensive topic into an easy-to-follow overview that a viewer can understand and retain at first sight. Importantly, only a few contrasting colours and fonts are used to support grouped information blocks.

Creating compelling visuals

Before you start designing visuals, several important factors should be considered. Below are listed some tips that will help you to get started.

- Begin by consulting the instructions of your target journal for specifications or other guidance.
- Understand your target audience. Will they be familiar with any terminology used? Will they understand your reference points?
- Craft your story. Choose the most meaningful and relevant data to focus on. Include all important information, from hypothesis to results.

- Use popular keywords and phrases to grab attention.
- Select the right design software for your needs and skill level, or work with a design professional.
- Pay attention to image quality and readability. Be mindful of text size and include ample whitespace to avoid crowding.
- Keep the design simple and easy to understand.
- Employ a text hierarchy for headings, subheadings, and body text. Use a maximum of three fonts.
- Avoid too many colours as this can distract the reader away from the main message; use one or two contrasting colours/shades instead
- Always use the principles of good design.

A great source of principles of good design is *Picturing Science: Design Patterns in Graphical Abstracts* from Jessica Hullmann.⁷ The full text is available at <https://www.researchgate.net/>.

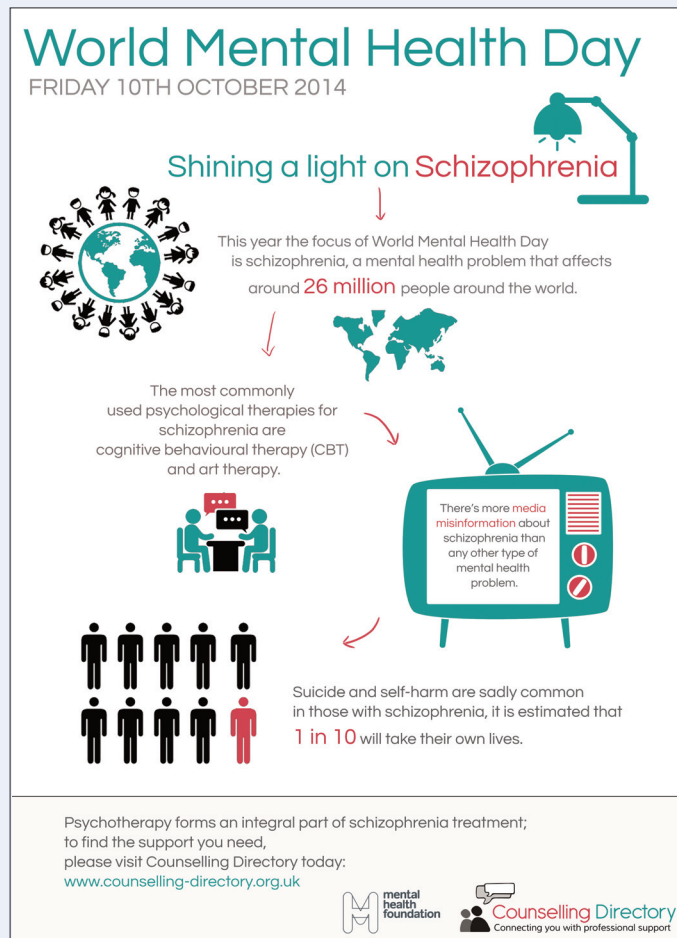


Figure 4. Screenshot of infographic designed by Counselling Directory addressing the World Mental Health Day 2014

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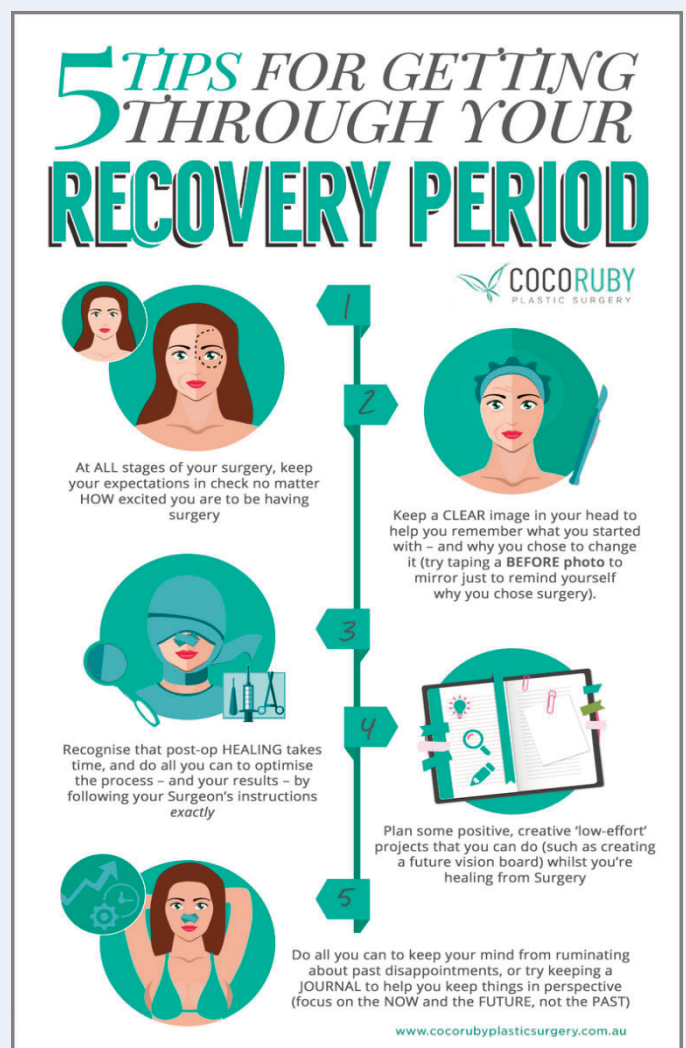


Figure 5. Post-treatment tips from Coco Ruby Plastic Surgery

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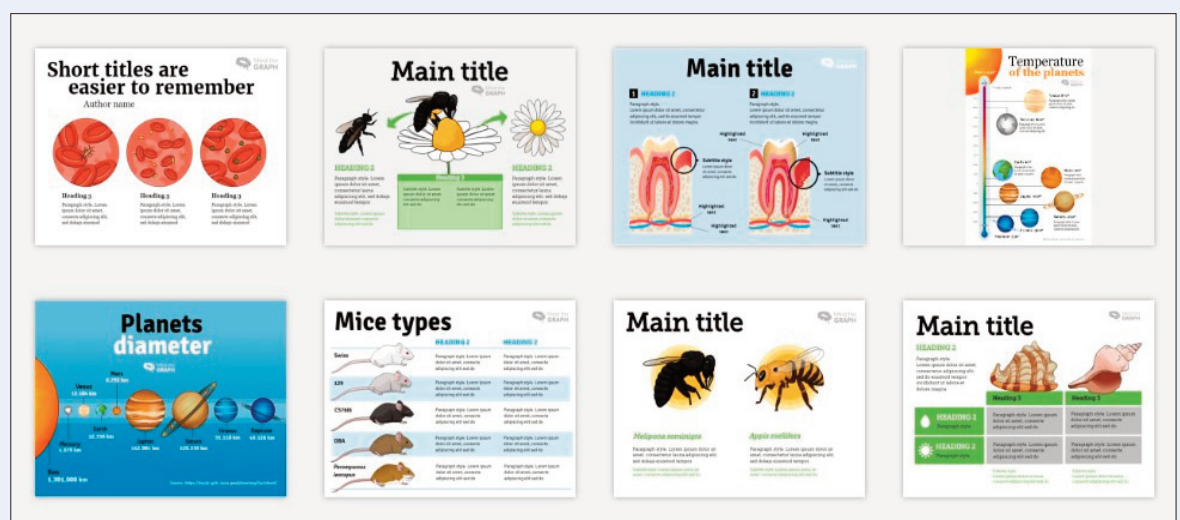


Figure 6. Screenshot of template section of Mind the Graph website⁸

Table 1: Comparison of various online design tools best suited to create infographics and graphical abstracts






	CANVA ⁹ 	VISME ¹⁰ 	VENNGAGE ¹¹ 	PIKTOCHART ¹² 	EASEL.LY ¹³ 
Overview	All-in-one visual communication design tool for design needs, infographics included	All-in-one visual communication design tool for marketers, focus on infographics	All-in-one visual communication design tool, focus on infographics	Comprehensive design tool for infographics and visual presentation styles (presentation, poster, banner, report, flyer, social media)	All-in-one visual communication design tool, for educators and students, small business owners, focus on infographic design
	Free plan gives access to most functions Possibility to purchase on demands User-friendly	Interactive with links, integration of animation and pop-ups Integrated analytics	Browse infographic templates by 8 different types, including statistical, informational, comparison and geographic	Includes graph and chart maker	Free design sand box; support options: articles, webinars, videos, direct customer support 6 Mio+ infographics
	50,000+ (total) 126 (infographics) categories: education, process, business, timeline, charity not searchable by categories	500+ (infographics)	100+ (infographics)	600+	732 searchable
Templates					
Editor	Drag and drop	Drag and drop	Drag and drop	Drag and drop	Drag and drop top bar menu
Icons	2,000+, scalable	1,000+, fully customisable	1,000+, fully customisable	4,000+ free	4,000+ free
Fonts upload	✓	✓	✓	✓	✓
Images library upload	1 Million+ API (Unsplash, Pexels, Pixabay)	1 Million+	1 Million+	1 Million+	681,982
		API (Unsplash)	API (Unsplash)	API (Unsplash)	
		✓	✓	✓	✓
Animation	✓	✓	No	✓	✓
Interactivity	Video, GIFs, sound media embed possible	Can link between blocks and to outside sources; can embed video and third-party content	Can link to outside sources; can embed video	Video, charts, map visualisation; animated icons embed possible	Video embed possible
Smart resize	✓	✓	✓	✓	
Download	JPEG, PNG, PDF	JPEG, PNG, PDF, HTML5	PNG, PNG HD, PDF and interactive pdf	PNG, JPEG	JPEG, PDF
Social sharing	✓	✓	✓	✓	JPEG, PDF

Table created with the information available in December 2019.

Abbreviation: API: application program interface

publication/325186940_Picturing_Science_Design_Patterns_in_Graphical_Abstracts.

No designer required

If you don't have a professional design team at your disposal, consider the following online tools to create your own detailed visuals in under 30 minutes, no experience needed. Most tools offer a free trial to assess their capabilities and come with affordable subscription options should you wish to invest.

Mind the Graph

Mind the Graph⁸ is an easy-to-use, comprehensive online graphic software that is specifically designed to cater to the design needs of the scientific community. It includes medical content like medical images, icons, and symbols and is my recommended tool for medical writers.

Mind the Graph provides a library of over 6000 scientific illustrations and ready-to-work template layouts for both graphical abstracts and infographics (Figure 6).

Other design tools

If you are new to designing and creating visual content, it's important to test various software tools and find the solution that best fits your needs. Begin your research with the handy chart in Table 1.

Other tools, not covered in the table, are Infogram,¹⁴ Vizualize.me,¹⁵ and Snappa.¹⁶ Creately¹⁷ is a chart maker tool that currently provides about 40 types of diagrams and over 100,000 diagram examples.

All online graphic design tools come with

tutorials on their websites, blogs, or on YouTube.

If you are more advanced and want to create your own illustrations from scratch, there are also plenty of easy-to-use, free graphic design desktop software options to choose from, e.g. Krita,¹⁸ Gravit Designer,¹⁹ and GIMP.²⁰

Don't forget to promote

In today's digital communications landscape, authors must adapt to the changing digital communications landscape to stand out. Not only do scientists, medical writers, and marketers need to create visually compelling content, but they also must market that content effectively. Study after study has proven the power of visual storytelling, but even the most compelling visuals are powerless if nobody sees them.

Therefore, once you have created your visuals, be sure to choose the right strategy for distribution. Your plan may include sharing on your own website or social media channels, reaching out individually to your network by email or even submitting your infographics to directories (Daily Infographic,²¹ Flickr,²² Infographic journal²³).

Visuals are vital, today and tomorrow

Recent years have seen a significant shift towards visual content in academia and medical communications, for example, easy-to-grasp infographics that break down complex information, attractive, scribed animations like whiteboard explainers and engaging video.

Graphical abstracts and infographics present new opportunities for promoting scientific research. They help to increase visibility and establish online credibility in a crowded content landscape. They are great assets that can be easily re-used as a whole or as parts and shared across different online channels such as social media, websites, and email event announcements.

Creating compelling visuals doesn't have to mean reinventing the wheel. Armed with the right online software and basic design principles, even the least digitally minded writer can produce visual accompaniments to their work.

Use the principles outlined above to create and disseminate visual content for your next publication project. Take note of the impact it has, not only on the initial interest in your findings but on how well the information has been digested, understood, and retained by your readers.

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Disclaimer

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Conflicts of interest

The author is self-employed and declares no conflicts of interest.

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