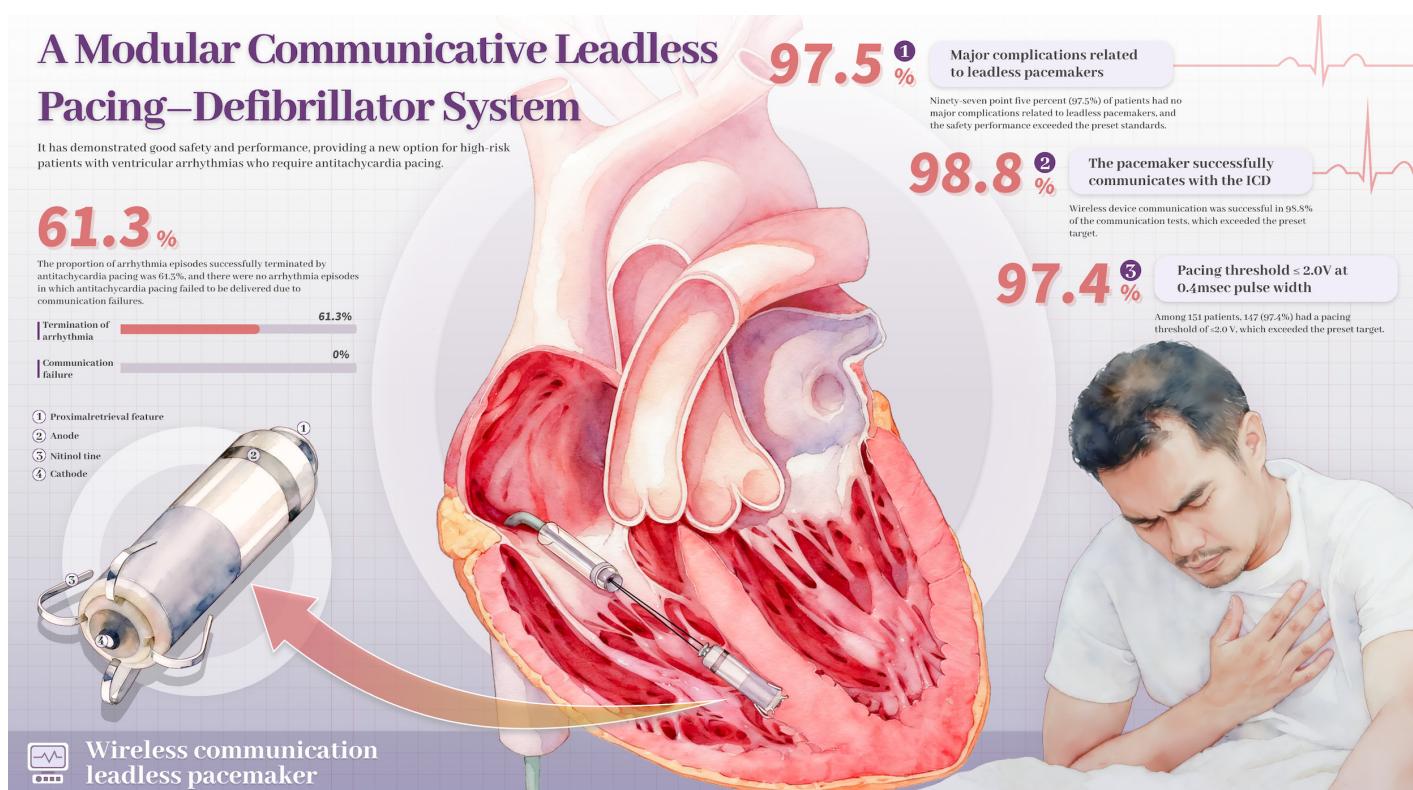


# 2025 WINNERS Medical Visualization Innovation Contest (MVIC)



## First Place A Modular Communicative Leadless Pacing-Defibrillator System (Entry 27)

Zheng Gong, Xiaoya Fan

### GENERAL COMMENTS:

#### Degree of Problem-Solving (appropriateness to audience, originality, effectiveness)

This engaging illustration is exceptionally well executed, combining clarity, originality, and visual appeal. The information is well organized, conceptually strong, and presented at a level appropriate for a general scientific audience. The composition successfully communicates complex information in a way that is both accessible and instructive, demonstrating excellent didactic value.

#### Design and Composition (use of color, type, and other design elements to create dynamic and balanced layout)

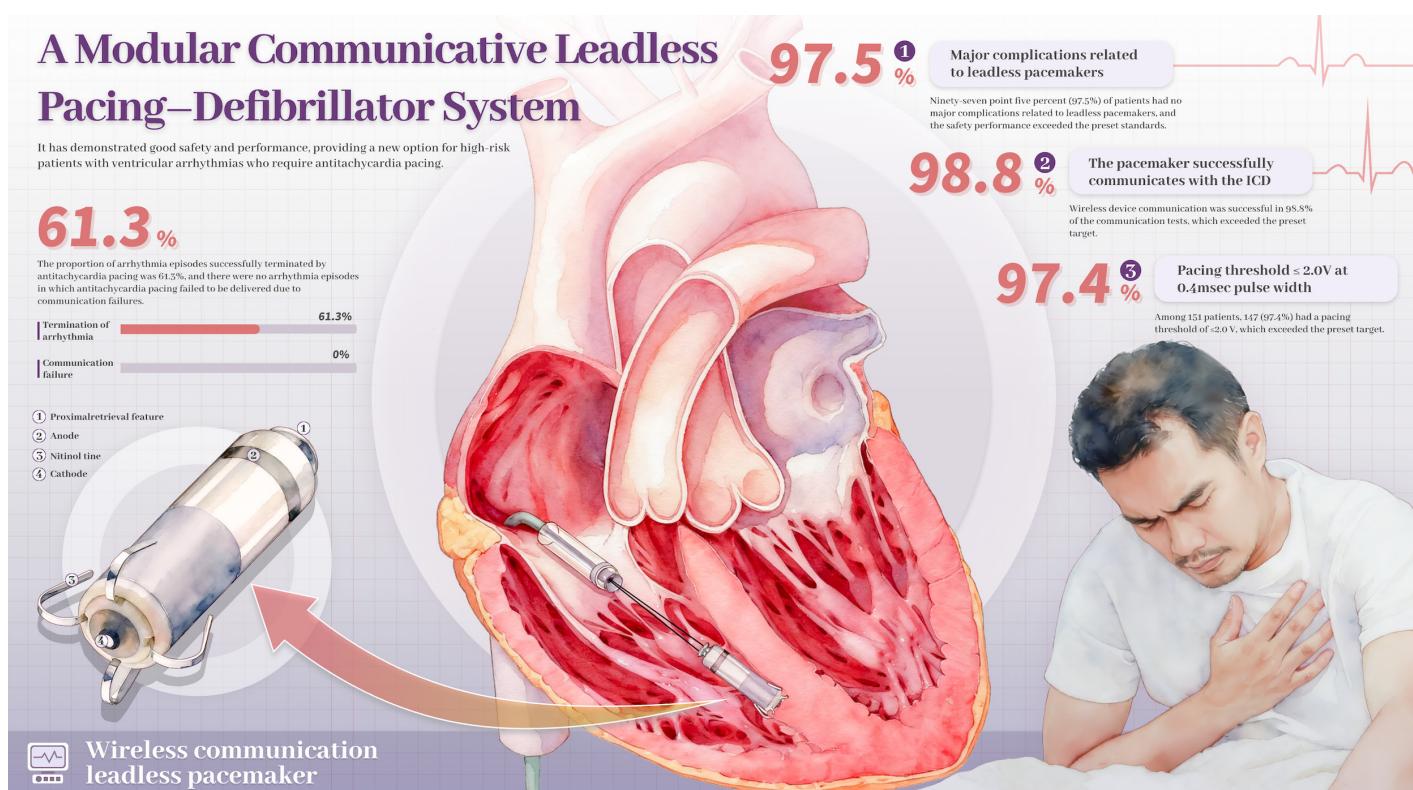
The thoughtful use of color, value, and contrast across all visual elements — including the patient, anatomy, medical device, background gradient, and text — results in a harmonious and visually balanced composition. The palette is inviting and professional, making the illustration stand out with a polished and cohesive look.

The chosen font style supports the professional tone of the piece, and the variation in text sizes effectively establishes visual hierarchy. The larger numbers draw attention to key facts, which helps guide the viewer through the content. We recommend slightly increasing the size of the smallest text elements to enhance legibility, especially when viewed at a distance. The title placement and scale at the upper left are strong design choices. The use of two numerical lists or groups of labeled elements works well because each is visually distinct, preventing confusion.

The subtle graph-paper background, gradient, and circular element behind the heart create a pleasing sense of depth and layering that adds energy and dimension to the composition.

Beginning the visual narrative with the leadless pacemaker on the left is a compelling choice. To strengthen the natural left-to-right reading flow, consider reversing the direction of the large arrow so that it moves from the pacemaker toward the heart. This simple adjustment would further clarify the sequence of information.

# 2025 WINNERS Medical Visualization Innovation Contest (MVIC)



## First Place A Modular Communicative Leadless Pacing-Defibrillator System (Entry 27)

Zheng Gong, Xiaoya Fan

### GENERAL COMMENTS:

#### Accuracy (anatomical, scientific, equipment and general proportions)

The anatomical rendering of the heart cross-section and the depiction of the leadless pacemaker are precise and accurate. The patient figure appears realistic and appropriately posed, supporting the overall scientific integrity of the piece.

#### Drawing/Software Proficiency (drawing skill, use of media and software, use of color, form, and depth of field)

The watercolor-style rendering of the heart and pacemaker is beautifully executed, demonstrating strong artistic technique. The use of color, light, and perspective shows a deep understanding of form and spatial relationships, resulting in an image that feels both realistic and engaging.

The seamless integration of traditional illustration, digital illustration and design software reflects an advanced level of technical skill and design sensibility. Together, these elements showcase the artists' strong command of both scientific accuracy and visual communication, making this an outstanding and memorable piece.

# 2025 WINNERS Medical Visualization Innovation Contest (MVIC)

## INTENSIVE BLOOD-PRESSURE CONTROL IN PATIENTS WITH TYPE 2 DIABETES

A research summary based on Bi Y et al. | 10.1056/NEJMoa2412006 | Published on November 16th 2024



## 2nd Place

### Intensive Blood-Pressure Control in Patients with Type 2 Diabetes (Entry 30)

Yiheng Zhao

#### GENERAL COMMENTS:

#### Degree of Problem-Solving (appropriateness to audience, originality, effectiveness)

The level of information in this illustrated poster is appropriate for the stated audience of academic physicians. The presentation of illustrations and graphic information is very well organized and the layout is easy to follow. The content is effectively arranged into sections on the panel. Overall, this is a very successful piece.

#### Design and Composition (use of color, type, and other design elements to create dynamic and balanced layout)

The use of color coding creates a very cohesive layout and leads the viewer through the piece. The subtle colors are very pleasing. The illustration drawing style is handled nicely and works well with the color palette to create a very engaging presentation. The icons in the right-hand panel are clear and understandable. Typically, the numbers on the y axis should be aligned on the left-hand side of the graphs along with the label.

The use of boxes to separate elements of the layout works well to keep the information organized and contained in logical groupings.

The visual hierarchy of the text size and font choices are appropriate and create good flow through the panels, however some of the text sizes are too small and are harder to read. In addition, it would be nice to reduce the number of variations in size and font to keep the overall appearance more cohesive and enhance legibility.

# 2025 WINNERS Medical Visualization Innovation Contest (MVIC)

## INTENSIVE BLOOD-PRESSURE CONTROL IN PATIENTS WITH TYPE 2 DIABETES

A research summary based on Bi Y et al. | 10.1056/NEJMoa2412006 | Published on November 16th 2024



## 2nd Place

### Intensive Blood-Pressure Control in Patients with Type 2 Diabetes (Entry 30)

Yiheng Zhao

#### GENERAL COMMENTS:

##### Accuracy (anatomical, scientific, equipment and general proportions)

The anatomical elements in the lower left and other illustrated objects in the central panel are accurate and nicely rendered. There are some issues with the proportions of the hand in the central panel. The drawing of the vessel wrapped around the glucose meter is an interesting choice however there are some problems with the perspective in that portions of the vessel that are farther in space (at the overlap) are larger than portions closer to the viewer.

##### Drawing/Software Proficiency (drawing skill, use of media and software, use of color, form, and depth of field)

This piece is aesthetically pleasing and the illustration style and color theme creates a beautiful appearance overall. The layout demonstrates an accomplished understanding and implementation of design principles. The illustrator demonstrates strong illustration skills, good use of color, and skilled knowledge of graphic design.

# 2025 WINNERS Medical Visualization Innovation Contest (MVIC)

## cfDNA for colorectal cancer screening

**Introduction**  
Colorectal cancer is the third most diagnosed cancer in adults in the United States. A blood-based test has the potential to improve screening adherence, detect colorectal cancer earlier, and reduce colorectal cancer-related mortality. DNA methylation is the most common epigenetic signature assayed in cfDNA. cfDNA is subjected to a chemical or enzymatic process that converts the epigenetic signature into a genetic change, which can then be detected with the use of DNA sequencing.

**What is cfDNA?**  
cfDNA is a composite of extracellular DNA molecules found in bodily fluids. It's made up of DNA molecules released from various tissues in the body.

**Where does cfDNA come from?**  
1. Apoptotic or necrotic tumor cell  
2. Tumor cells release DNA into the bloodstream  
3. Tumor-derived DNA in plasma  
4. DNA fragmentation continues extracellularly with DNase

**DNA methylation process**  
methyl group  
Histone  
RBC  
Other blood cells  
DNA methylation  
Cytosine (C)  
5-methylcytosine (5mC)

**Methods and Result**  
Chung et al. assessed the performance characteristics of a cell-free DNA (cfDNA) blood-based test in a population eligible for colorectal cancer screening.

**Population**  
The clinical validation cohort included 10,258 persons, 7861 of whom met eligibility criteria and were evaluable.

**Mean age**  
The mean age of the participants in the evaluable cohort was 60 years (range, 45 to 84).

**Sensitivity**  
detection of colorectal cancer: 83.1%; stage I, II, or III colorectal cancer: 87.5%.

**Specificity**  
specificity for advanced neoplasia: 90%.

**Information type**  
• methylation status  
• aberrant fragmentation patterns  
• presence or absence of somatic pathogenic variants

**Historical timeline of cfDNA screening**

- 1948: Mandel and Métais described the presence of circulating, cell-free nucleic acids (cfNA) in human blood for the first time.
- 1948: Amplification of tumor associated oncogene and RAS gene mutations are detected in cfDNA isolated from patient with leukemia and pancreatic cancer.
- 1994: Microsatellite alterations in cell-free DNA are shown in cancer patients.
- 1996: Dennis Lo and colleagues proposed the presence of cell-free foetal DNA in maternal blood circulation in 1997. ATTCGATT CGATTCGA TTCCATTC
- 1997: cfDNA whole exome sequencing analysis of cfDNA in patients with acquired resistance to cancer therapy.
- 2013: cfDNA analysis of cfDNA in patients with acquired resistance to cancer therapy.

## 2nd Place

### cfDNA for Colorectal Cancer Screening (Entry 31)

Qiuwan Liu

#### GENERAL COMMENTS:

#### Degree of Problem-Solving (appropriateness to audience, originality, effectiveness)

The level of information is appropriate for the stated audience, undergraduate medical students. The presentation of information and informative visuals make this an effective piece.

#### Design and Composition (use of color, type, and other design elements to create dynamic and balanced layout)

The limited color palette is pleasant and effectively used to move the viewer through the piece. The use of 3D models and schematic illustration style create an aesthetically pleasing and engaging figure.

The use of numbers to indicate the process of cfDNA availability in the bloodstream is appreciated and visually organized. It would be helpful if the inset showing the source steps of the cfDNA and the description text, "Where does cfDNA come from", could be closer together so viewers do not miss their connection.

The timeline on the dark background visually anchors the piece as well as successfully separates the historical content from the teaching and process elements of the piece. The brackets displaying the year are creative but would be better served on the left side of the entry for ease of reading. The timeline year bracket design opens towards the right, but the information is connected to the entry on the left, which is visually cut off by the bracket design. If the bracket were on the left of the associated fact, it would open towards it as connection, and the line would separate from the next entry.

The visual hierarchy created through font and text size is successful. The creative font used for "DNA" in the title of the piece is appreciated, however, as a delicate font, that vital text element becomes difficult to read as compared to the other bold title text.

# 2025 WINNERS Medical Visualization Innovation Contest (MVIC)

## cfDNA for colorectal cancer screening

**Introduction**  
Colorectal cancer is the third most diagnosed cancer in adults in the United States. A blood-based test has the potential to improve screening adherence, detect colorectal cancer earlier, and reduce colorectal cancer-related mortality. DNA methylation is the most common epigenetic signature assayed in cfDNA. cfDNA is subjected to a chemical or enzymatic process that converts the epigenetic signature into a genetic change, which can then be detected with the use of DNA sequencing.

**What is cfDNA?**  
cfDNA is a composite of extracellular DNA molecules found in bodily fluids. It's made up of DNA molecules released from various tissues in the body.

**Where does cfDNA come from?**

- 1 Apoptotic or necrotic tumor cell
- 2 Tumor cells release DNA into the bloodstream
- 3 Tumor-derived DNA in plasma
- 4 DNA fragmentation continues extracellularly with DNase

**DNA methylation process**

Diagram illustrating the DNA methylation process. A methyl group (CH<sub>3</sub>) is added to the 5-position of a cytosine (C) base in a DNA strand, resulting in 5-methylcytosine (5mC).

**Methods and Result**  
Chung et al. assessed the performance characteristics of a cell-free DNA (cfDNA) blood-based test in a population eligible for colorectal cancer screening.

Population	Mean age	Sensitivity	Specificity	Information type
The clinical validation cohort included 10,258 persons, 7861 of whom met eligibility criteria and were evaluable	The mean age of the participants in the evaluable cohort was 60 years [range, 45 to 84]	detection of colorectal cancer: 83.1%; stage I, II, or III colorectal cancer: 87.5%	specificity for advanced neoplasia: 90%	<ul style="list-style-type: none"><li>methylation status</li><li>aberrant fragmentation patterns</li><li>presence or absence of somatic pathogenic variants</li></ul>

**Historical timeline of cfDNA screening**

- 1948: Mandel and Métais described the presence of circulating, cell-free nucleic acids (cfNAs) in human blood for the first time.
- 1948: Amplification of tumor associated oncogene and RAS gene mutations are detected in cfDNA isolated from patient with leukemia and pancreatic cancer.
- 1994: Microsatellite alterations in cell-free DNA are shown in cancer patients.
- 1996: Dennis Lo and colleagues proposed the presence of cell-free foetal DNA in maternal blood circulation in 1997.
- 1997: cfDNA whole exome sequencing analysis of cfDNA in patients with acquired resistance to cancer therapy.
- 2013: cfDNA analysis of cfDNA in patients with acquired resistance to cancer therapy.

## 2nd Place

### cfDNA for Colorectal Cancer Screening (Entry 31)

Qiuwan Liu

#### GENERAL COMMENTS:

#### Accuracy (anatomical, scientific, equipment and general proportions)

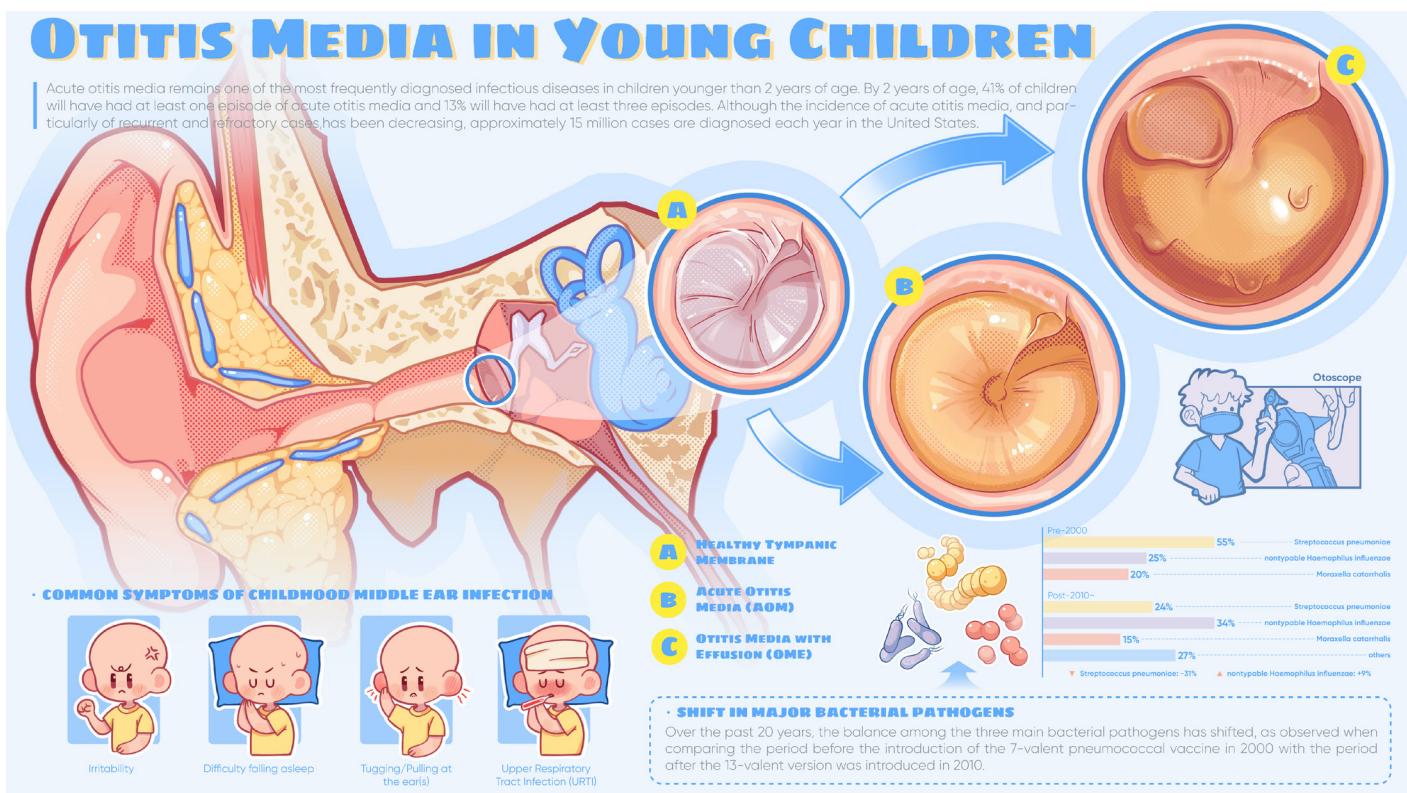
Stylized depiction of the test tube components related to gathering cfDNA, and the stylized DNA methylation are accurate, effective medical illustrations.

The numbered, rectangle inset showing cfDNA in blood stream is helpful, but slightly misleading. The origin of the inset is a circle on the colon, but vasculature is not shown on the colon illustration. The rectangle inset could be misconstrued as colon rather than vessel. Consistency in the shape of the inset and origin location shape is helpful. Additionally, labeling of structures would also add clarity.

#### Drawing/Software Proficiency (drawing skill, use of media and software, use of color, form and depth of field)

The piece demonstrates an accomplished understanding and implementation of design principles. The illustrator demonstrates strong knowledge of 3D software, graphic design skills, and color theory.

# 2025 WINNERS Medical Visualization Innovation Contest (MVIC)



## 3rd Place

### Otitis Media in Young Children (Entry 33)

Yuanlin Zhu

#### GENERAL COMMENTS:

#### Degree of Problem-Solving (appropriateness to audience, originality, effectiveness)

The level of information presented is well-suited for the intended audience. The content is digestible and accessible to lay individuals, such as parents of young children. The choice of information and visuals is effective overall, though some reorganization of the layout could make the presentation more compelling and easier to follow.

#### Design and Composition (use of color, type, and other design elements to create dynamic and balanced layout)

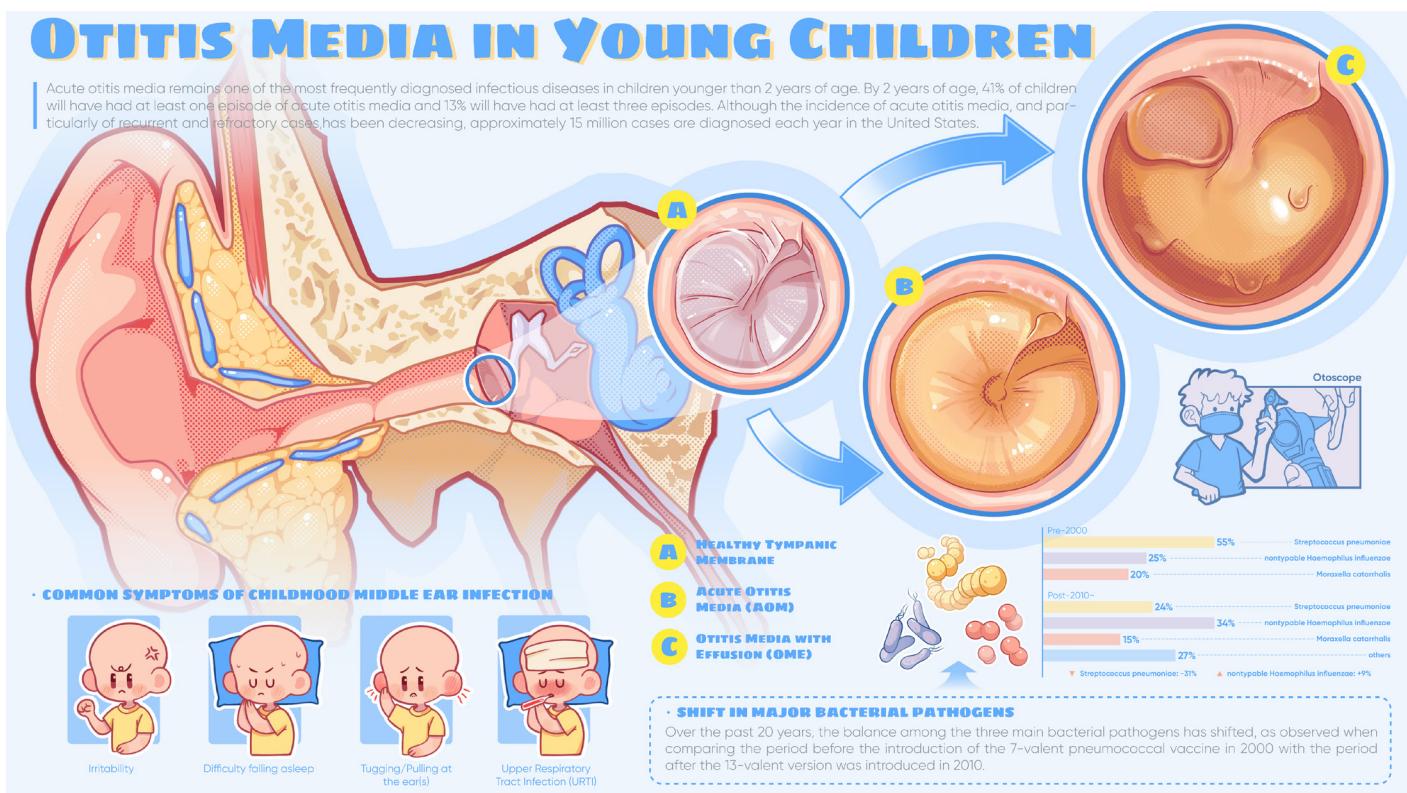
The graphic design and illustration style are thoughtfully chosen and appealing for a lay audience involving young children. The color scheme is cohesive and visually pleasing. Overall, the use of visual hierarchy through differences in scale is successful. This graphic could generally benefit from some layout revision and enhanced legibility.

A note for improvement is to darken the grey text for better contrast and legibility. For the opening paragraph, fading out the top portion of the ear graphic and shortening the text box so that it does not overlap with the circular callouts would also improve legibility.

The otoscope illustration is an effective illustration to orient the viewer and could be more effective if moved to the top left corner. This placement would provide the viewer with necessary context to understand the following visuals. Removing the bullet points from subheadings is also advised, as they currently add unnecessary visual clutter.

The current combination of lettered labels (A, B, C) and arrows on the circular callouts is a bit confusing. Since otitis media with effusion (OME) can develop either from acute otitis media (AOM) or independently, the arrows and lettering are potentially misleading. It would be clearer to remove them and instead place the labels "healthy tympanic membrane," "acute otitis media (AOM)," and "otitis media with effusion (OME)" directly above or arcing around each corresponding circle. Adding anatomical labels — such as the tympanic membrane — and short descriptions highlighting the anatomical differences between the healthy ear, AOM, and OME depictions within the circular callouts could also add more depth to this information graphic.

# 2025 WINNERS Medical Visualization Innovation Contest (MVIC)



### 3rd Place

#### Otitis Media in Young Children (Entry 33)

Yuanlin Zhu

##### GENERAL COMMENTS:

The text box titled "Shift in Major Bacterial Pathogens" would be better positioned directly below the circular callouts, as it appears to provide context for the accompanying graph. In its current placement, the graph lacks context until the viewer reads the text box. It would also be beneficial to remove the bacterial labels from the graph itself and instead overlay them onto illustrations of the bacteria. This change would reduce visual clutter, minimize redundancy, and allow viewers to focus more effectively on the data. The color coding of the graph bars and corresponding bacteria illustrations works well.

Reorganizing the graph data so that pre-2000 and post-2010 data for each bacterial category are displayed side by side would allow for quick visual comparisons — for instance, making it easier to identify the decrease in *Streptococcus pneumoniae* over time. Color-coding the arrows to indicate change (e.g., green for decreases and red for increases) would further enhance clarity. Placing this summary data adjacent to each set of bacterial bars would also decrease visual search and make the statements more immediately meaningful.

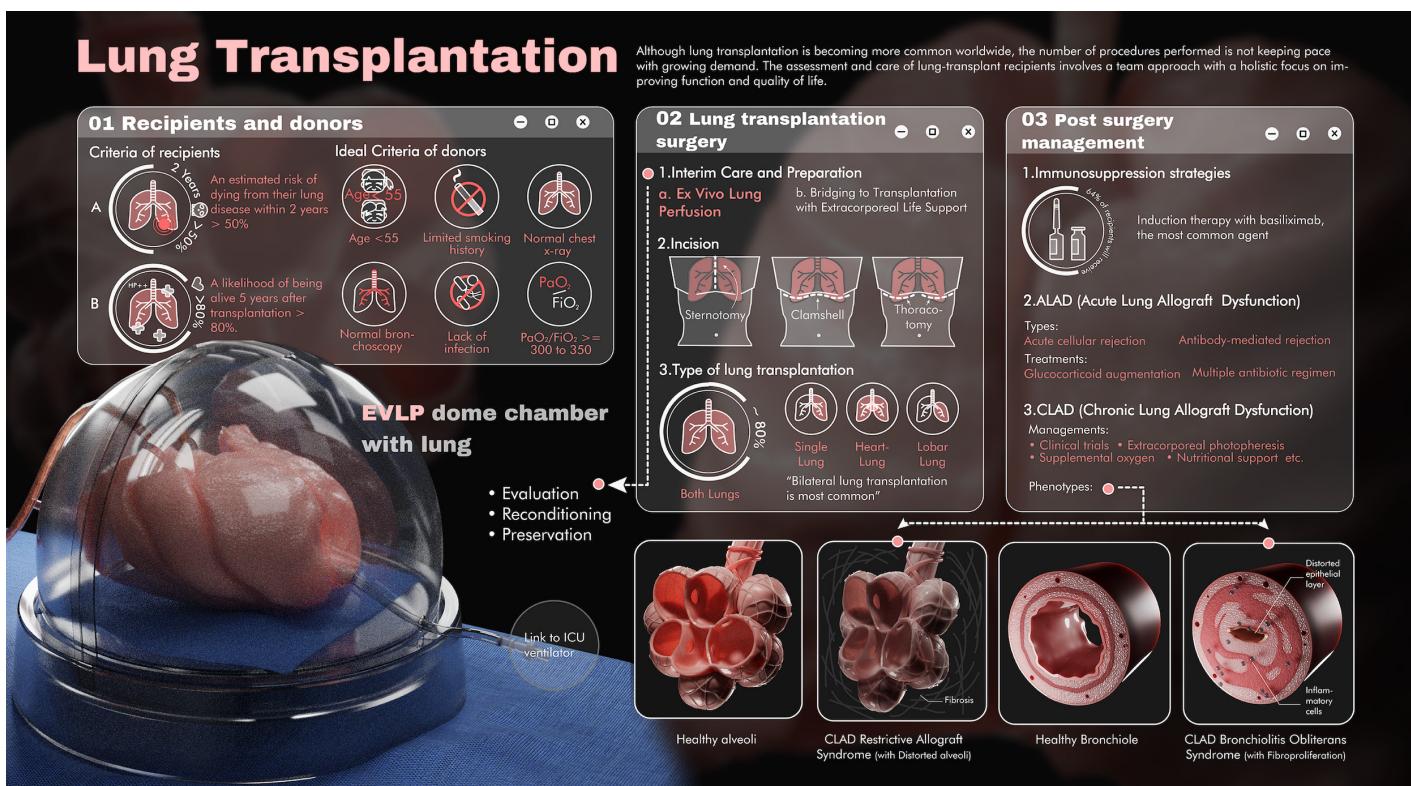
##### Accuracy (anatomical, scientific, equipment and general proportions)

The depictions of the tympanic membranes and ear anatomy appear generally accurate in terms of proportion and anatomical representation. However, since the external acoustic meatus is a canal that passes through the temporal bone, the illustration should depict a cross-section of the temporal bone beneath the external acoustic meatus, rather than the current shard of bone shown.

##### Drawing/Software Proficiency (drawing skill, use of media and software, use of color, form, and depth of field)

The piece demonstrates a strong understanding and application of design principles. The illustrator shows excellent proficiency in color theory, graphic illustration, and overall visual design. The work reflects both technical competence and thoughtful aesthetic choices that enhance the educational purpose of the piece.

# 2025 WINNERS Medical Visualization Innovation Contest (MVIC)



## 3rd Place

### Lung Transplantation (Entry 24)

ZheChen

#### GENERAL COMMENTS:

#### Degree of Problem-Solving (appropriateness to audience, originality, effectiveness)

This piece demonstrates an appropriate style for the intended audience (physicians and public), both approachable in its icons and toy-like 3D rendering style, but also credible in its attention to detail and accuracy.

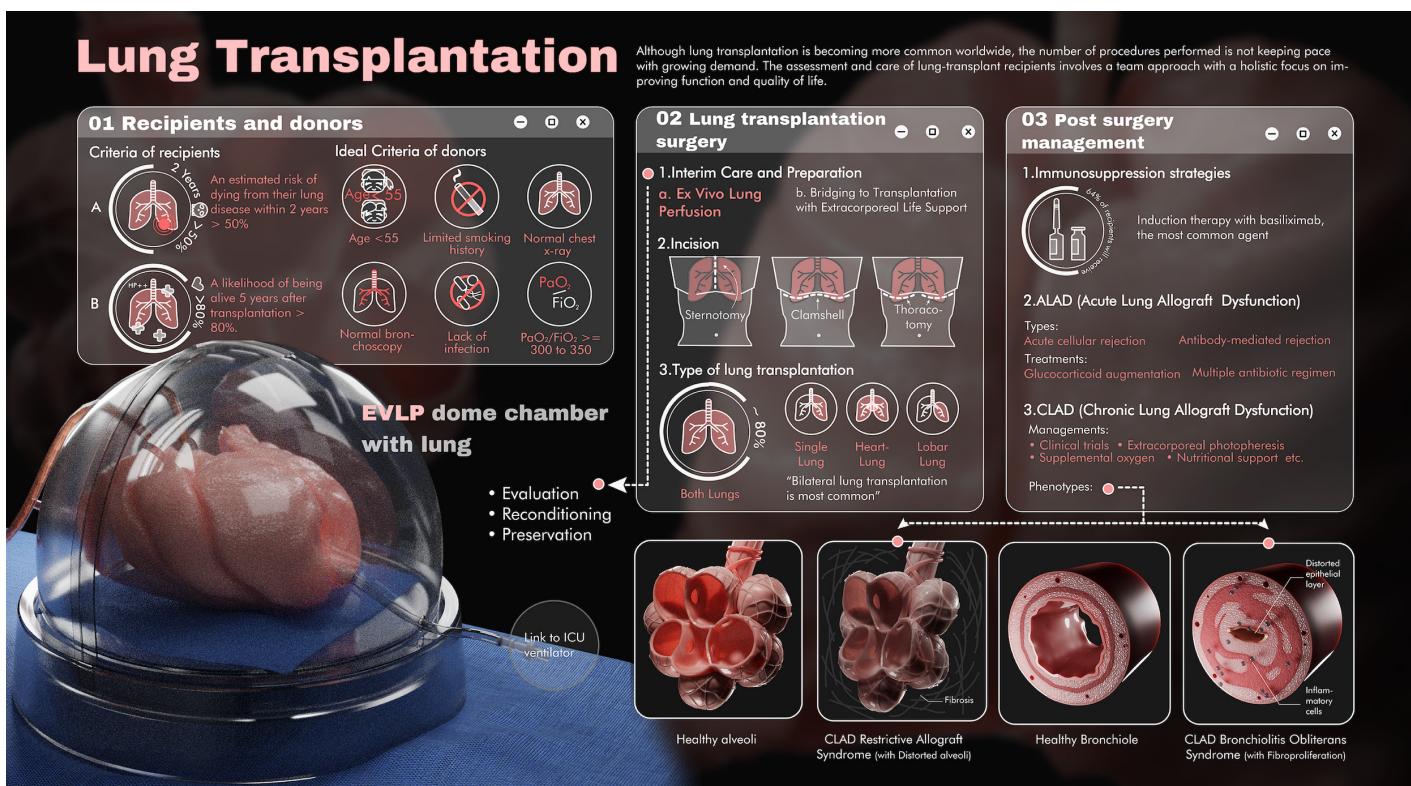
#### Design and Composition (use of color, type, and other design elements to create dynamic and balanced layout)

The combination of 3D rendering and didactic iconography balance each other stylistically. The limited color palette is successful in keeping the piece visually clean, particularly with the high level of content presented. The high contrast is eye-catching and draws the viewer in, but perhaps is over-emphasized in areas that are not the focus of the story (e.g., bronchioles in bottom right). Text size is readable and appropriate, but there are a few inconsistencies in the hierarchy (e.g., EVLP). Overall, the icons are well-designed, clear and inviting, however we were curious to see how they would work without the circles enclosing them, to reduce visual clutter. The icons with faces were a little confusing. The percentage rings are a creative solution, however not entirely intuitive, particularly with the level of information already presented.

In general, our feedback has to do with finding ways to reduce the visual busyness of the piece (removing the "minimize" and "close" icons at the top right of each section header, choosing a numbering or naming convention throughout [e.g., not "A" and "B" then "1,2,3..."] and exploring alternatives to the dashed arrows with pink dots). At the same time, the layout is organized and effectively arranged into sections, and guides the viewer through the material well.



# 2025 WINNERS Medical Visualization Innovation Contest (MVIC)



## 3rd Place

### Lung Transplantation (Entry 24)

ZheChen

#### GENERAL COMMENTS:

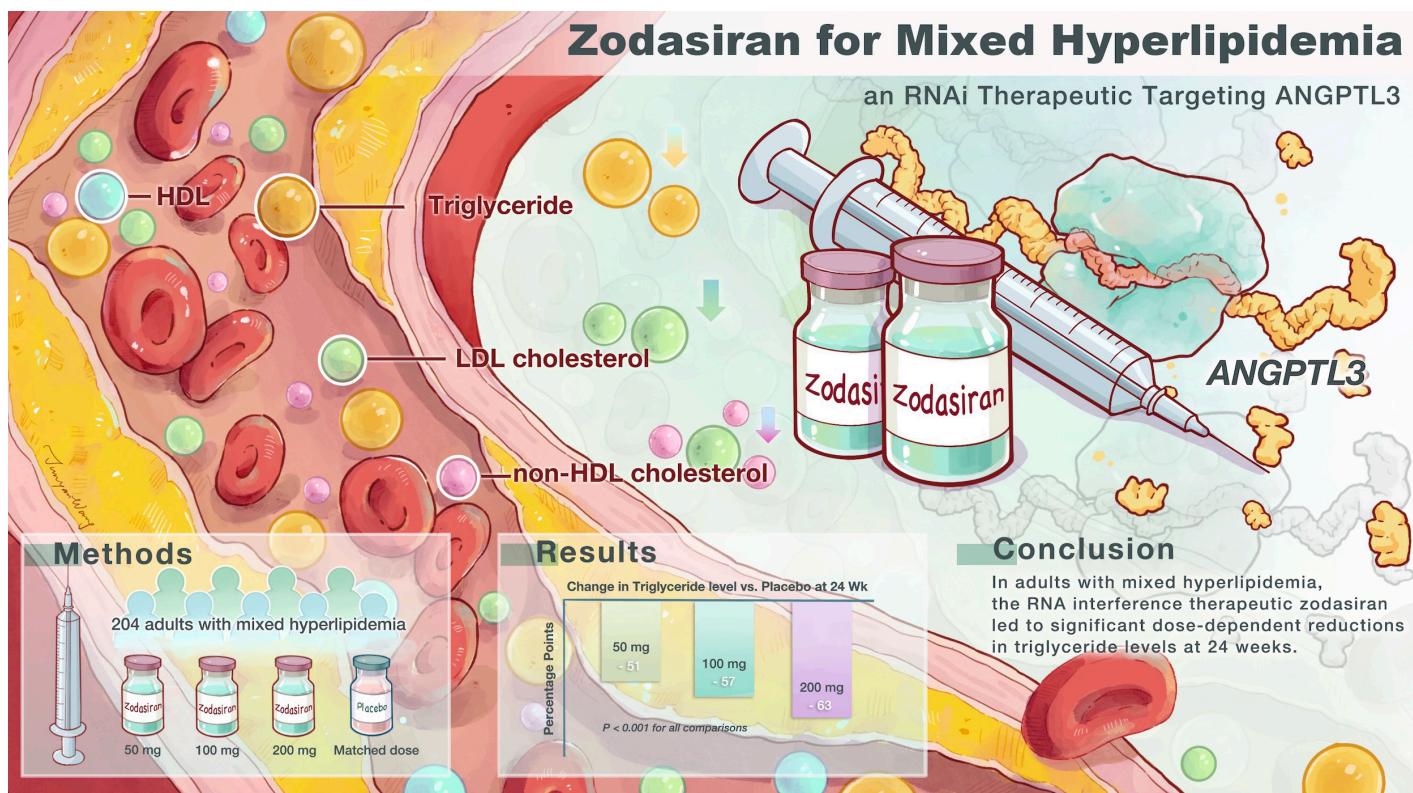
#### Accuracy (anatomical, scientific, equipment and general proportions)

The device and anatomy are represented accurately for the purpose of this piece. The translucency of the models shows understanding of the tissue, but without getting lost in realism and details — an appropriate stylistic choice. The side-by-side in the lower right helps the viewer make comparisons and understand more easily. The operating room cloth and harsh lighting give the feel that the viewer is in the operating room. The faded structures in the background give the piece depth. Recognizing the difficulty in creating a piece for a wide- ranging audience as this one, some of the text offers little context for the viewer to more fully understand.

#### Drawing/Software Proficiency (drawing skill, use of media and software, use of color, form, and depth of field)

The illustrations demonstrate a depth of understanding of design and proficiency in 3D software, as well as intentional restraint in palette and level of detail. The figure demonstrates proficient use of multiple software tools, showcasing good technical knowledge and skill.

# 2025 WINNERS Medical Visualization Innovation Contest (MVIC)



## 3rd Place

### Zodasiran for Mixed Hyperlipidemia (Entry 5)

Junyan Wang

#### GENERAL COMMENTS:

#### Degree of Problem-Solving (appropriateness to audience, originality, effectiveness)

The art style and color palette is inviting. The level of simplification of the anatomical and biological elements such as the RNA and ribosome is appropriate for this artistic approach. Including the syringe and drug vial helps communicate the drug delivery method. It would be equally effective if it was just 1 drug vial instead of 2. The summary of what Zodasiran does lacks some contrast (color choice of lipids and down arrows). The gradient colors on the down arrows would be more visible if they were 1 unifying color. This may also enhance contrast and group the information as a distinct area more effectively. Using the triglyceride colors in the data may cause association of the data with a specific cholesterol type.

#### Design and Composition (use of color, type, and other design elements to create dynamic and balanced layout)

The layout of elements is easy to follow. Balance of elements could be enhanced if the "Conclusion" section was also boxed. The opacity on the white boxes behind the "Methods" and "Results" sections could be increased to allow for increased legibility of the data. The blue rectangle next to the headers could also be a different color and smaller so as not to interfere with legibility of the text.

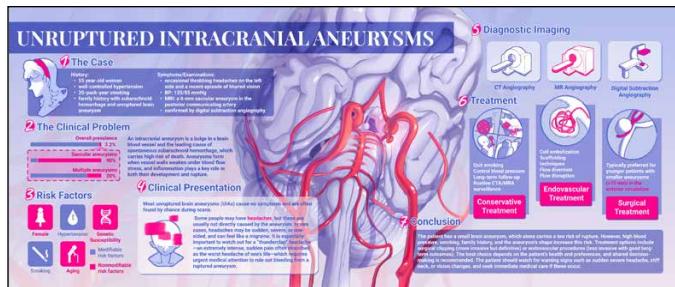
#### Accuracy (anatomical, scientific, equipment and general proportions)

Anatomy and biological forms are simplified but still appear accurate for the level of detail presented in the figure. It may help to distinguish the various lipid types if they were illustrated with more detail than just spheres of varied sizes.

#### Drawing/Software Proficiency (drawing skill, use of media and software, use of color, form, and depth of field)

The artwork and graphic design demonstrate a reasonable proficiency in the chosen software.

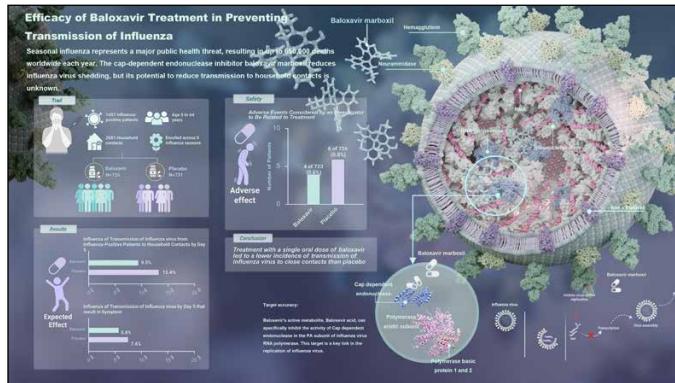
Unruptured Intracranial Aneurysms (Entry 21) | Xiaoyu Zhou



COMMENTS

- Great use of a limited color palette. The bright pink color is effective at drawing the eye to various points of focus. Minor comment is that the pink text on top of the purple background is difficult to read, as these colors have similar values (i.e., there needs to be more contrast between the colors).
- The brain illustration is very painterly, with good light-on-form.
- Inset illustrations and iconography is successfully done.

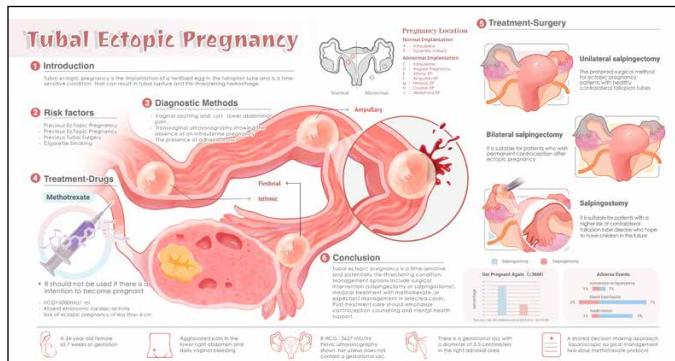
Efficacy of Baloxavir Treatment in Preventing Transmission of Influenza (Entry 17) | WenJun Zhao



COMMENTS

- Nice application of 3D protein modeling with an elegant color scheme.
- Graphs and schematics were a consistent style throughout and overall, did a decent job conveying information. The schematic diagram of viral replication is effective but too small to see easily — it deserves a bit more real estate.
- Some text was hard to read over a busy background of similar color and value, notably the labels within the virus. Similarly, some leader lines and arrows were hard to see. Adding a drop shadow or using a color that contrasts better against the background colors would help.

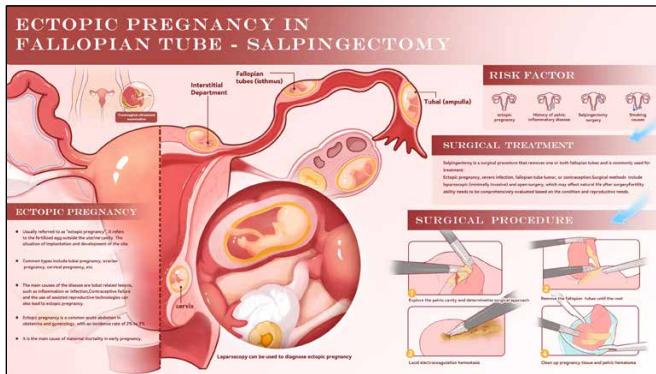
Tubal Ectopic Pregnancy (Entry 14) | Lingli Ding



COMMENTS

- The schematic diagrams and the “Treatment: Surgery” illustrations are very nicely done — effective and didactic presentation of information with nice rendering. The “Pregnancy Location” schematic is quite clear. Minor comment is that the gray circles behind the letter labels could go darker for better visibility.
- Overall, good graphic design and flow of information.
- The illustration of the embedded embryos was not quite shown accurately. The embryos look like fetuses and they don't look very embedded.
- The blood burst in the central inset is dramatic and draws your attention, however, it may not be the best visual for the target audience.

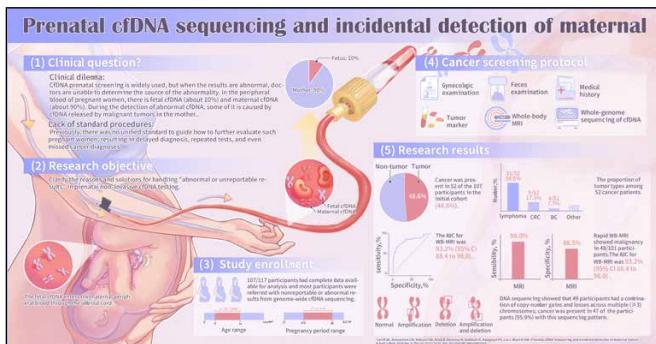
## Ectopic Pregnancy in Fallopian Tube—Salpingectomy (Entry 3) | Yiyuan Wang



### COMMENTS

- The surgical steps are clear and nicely handled. Instrumentation is well-rendered.
- In the orientation inset, the uterus looks a bit large compared to the woman's body at the depicted stage of gestation.
- Some icons are a bit small, notably in the “Risk Factor” box. Similarly, the transvaginal ultrasound inset is much too small for the level of detail it is showing.
- There is good depth in the main illustration, with effective wet highlights. However, the depiction of embryo implantation looks a bit inaccurate and rudimentary.
- The fimbriae of the fallopian tube in main illustration are a bit cartoonish compared to the rest of the illustration.

## Prenatal cfDNA Sequencing and Incidental Detection of Maternal (Entry 13) | Qihua Zhang



### COMMENTS

- Pleasing colors, though additional contrast/moments of darker tone would add depth and focal points.
- Some nice moments with rendering, however, the anatomy and proportions of the mother and fetus aren't accurate in some places.
- Icons are effective, but would recommend darkening the purple to make them stand out a little better.
- Some text is hard to read, either in terms of the size or the font. Possibly, there was an issue with the font, as there are some mixed letter widths.
- The zoom-out effect of the blood-collection tube is a nice idea, but there are places where the tube doesn't look smooth and loses the illusion. Similarly, the veins are a bit lumpy in appearance.

## Otitis Media in Young Children (Entry 26) | Luyao Lei



### COMMENTS

- The baby illustration has good proportions and is very painterly. The illustrator did a good job capturing the facial expression.
- Good rendering of ear drums. When showing normal and pathological anatomy, it's preferable to depict them at the same size for easier comparison.
- Text was a bit small and hard to read in certain areas. Some text could have been more graphically presented.
- The styling and variation in line thickness of the arrows is a bit distracting here.
- The icons lack consistency in style, detracting from the cohesive look and feel of the piece (e.g., the cartoon of the baby in the inset is so different from the other icons, and this style isn't repeated anywhere else in the piece). Some icons are a bit small. The suspension icon wasn't immediately clear as to what it was depicting.