Graphic Narratives as Interprofessional Teaching Tools

Audrey Tran, Pam Pierce, MS MLS, Molly Osborne, MD PhD
OHSU and VA Medical Center

Learning Objectives

- **Understand value of Graphic Narratives in Interprofessional medical education**
- How to apply graphic narrative techniques – premedical education (A Tan)
- Access Graphic Narrative educational materials in the BICC: (P Pierce)
- Use Interprofessional Graphic Narratives as teaching tools (M Osborne)
- Identify Graphic Narrative techniques useful in your educational portfolio

Understand the value of graphic narratives in Interprofessional education

- Graphic Narratives uniquely demonstrate
  - The reaction to bad news; ‘only 5%!!’
  - Multiple feelings experienced simultaneously in an Interprofessional team
  - Moral Distress felt in an Interprofessional team; i.e. ‘we’re torturing him’
  - Methods used to address moral distress; i.e. ‘putting on armor’

Learning Objectives

- Understand role of Graphic Narratives in Interprofessional medical education
- **How to apply graphic narrative techniques – premedical education (A Tan)**
- Access Graphic Narrative educational materials in the BICC: (P Pierce)
- Use Interprofessional Graphic Narratives as teaching tools (M Osborne)
- Identify Graphic Narrative techniques useful in your educational portfolio

Future Work

- Colorblind or visually impaired learners
- A complement vs. a replacement for teaching
- For particularly challenging topics to visualize
  - Pathophysiology between multiple organ systems (FUND)
  - Workflow algorithms (e.g. workup of dx)
  - Classification of key points for clerkship
  - Workshops for students to visualize their own diagrams

Applications of graphic narrative techniques in premedical education

Audrey Tran

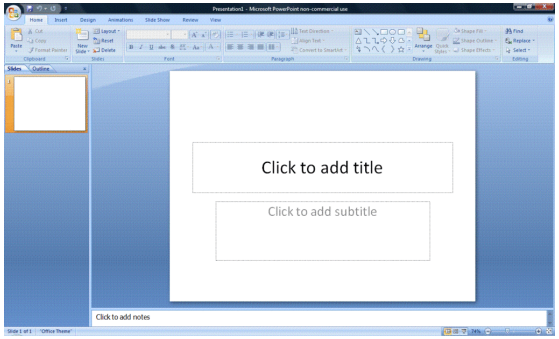
Message vs. Medium

What you remember vs why you remember it!

- Mnemonics
- Case-based learning
- Study guides + PowerPoint slides
- Third party “high yield” websites and materials
- Tutoring sessions

Are our current tools the best medium to tell a story that students can visualize, recall, and remember?

Classic methods of delivering stories in education



Powerpoint Presentations

Roadmap

something to hang your hat on
big pictures takeaways

Clear objectives and summaries

emphasizes essentials

Examples

cases to prove a point

Mini-quiz feedback

quickly assesses info absorption

Consolidation

An understanding of how new information fits into one's overall foundation of knowledge

Study Guides

GCD 3033 Spring 2012

Cell Biology Study Guide
ECB Chapter 6

DNA replication

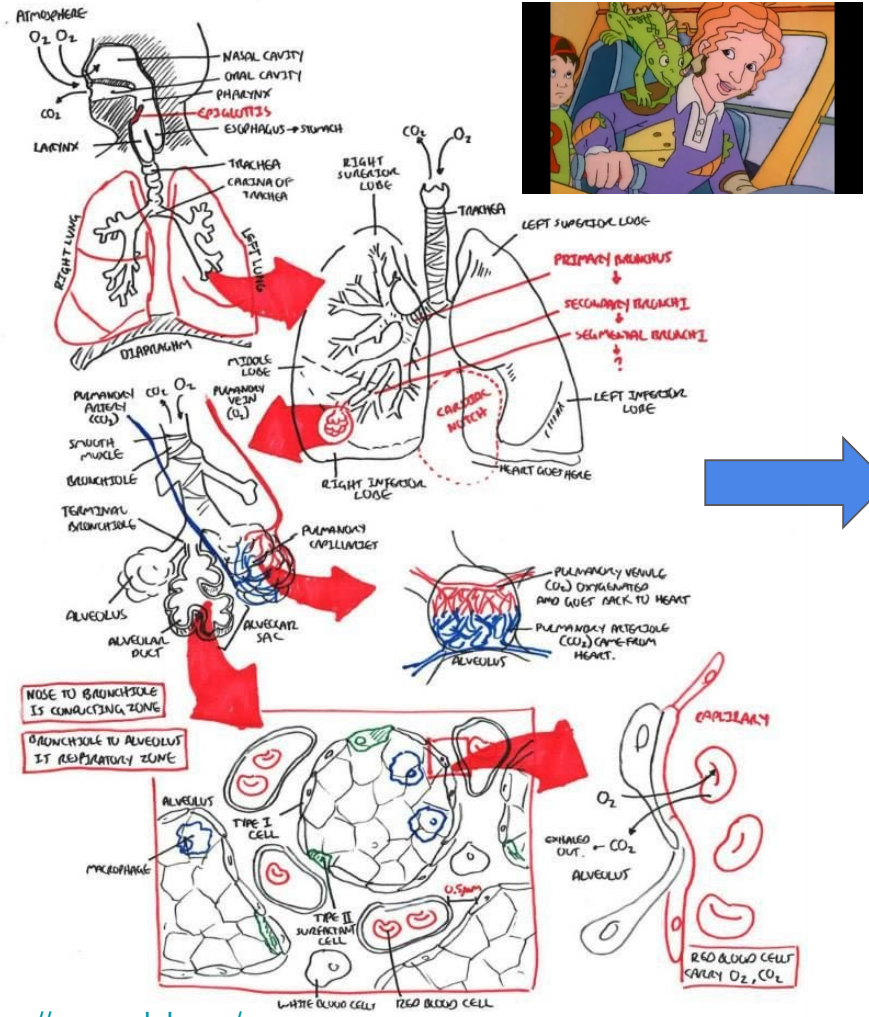
The ability to accurately replicate and repair DNA is critical to life. The mechanism of DNA replication is built into the DNA double helix, with each strand acting as a template to form a new complementary strand. This type of replication is called **semi-conservative**: one strand in each replicated DNA molecule is passed on directly from the original, while the other strand is newly synthesized. Evidence for this model was obtained in the 1950s using heavy and light isotopes of nitrogen in a famous series of experiments by Meselson and Stahl (see "How We Know," page 200).

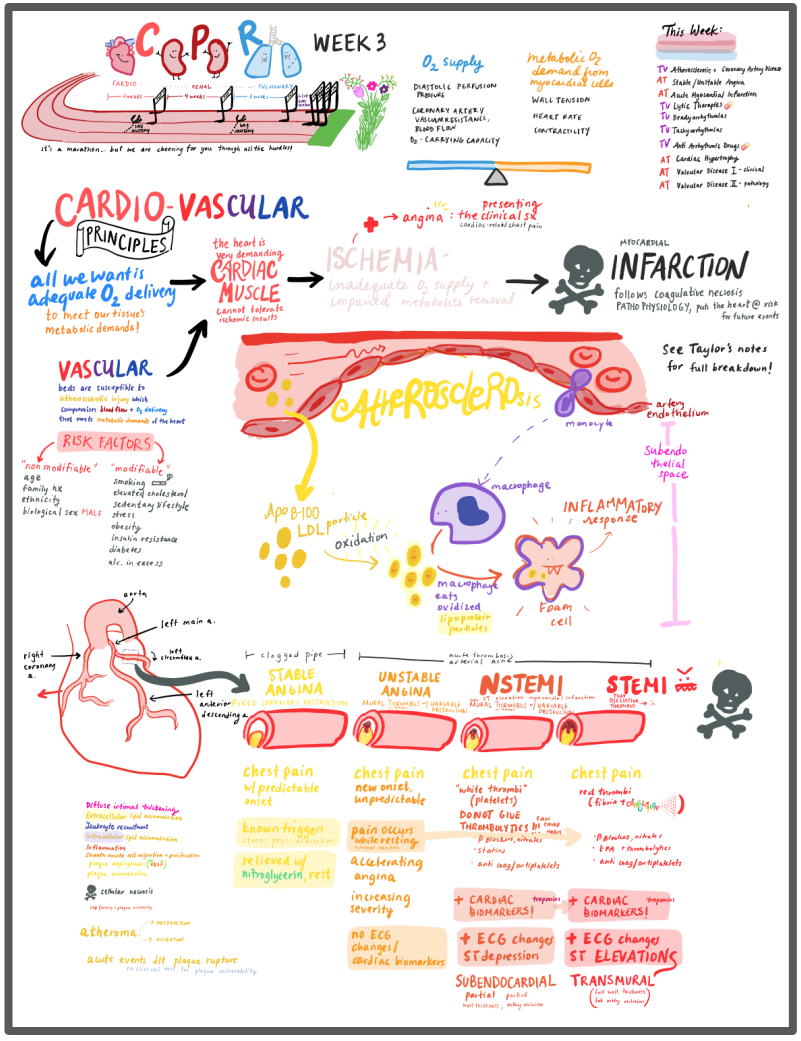
DNA replication begins at multiple points along a chromosomes, at A-T rich sequences called **replication origins**. A short stretch of DNA double helix is unwound at the origins, providing access to **DNA polymerase** and associated factors. A single DNA polymerase molecule catalyzes the addition of thousands of nucleotides to the growing 3' end of a DNA strand, using the hydrolysis of phosphate bonds as energy.

DNA replication proceeds in both directions from replication origins at **replication forks**, which move outward from the origin as the two DNA strands unwind. Because of the inverse polarity of each DNA strand, the replication fork is asymmetrical: DNA synthesis in the 5' to 3' direction moves toward the replication fork on one strand (the **leading strand**) and away from the replication fork on the other strand (the **lagging strand**; see Figure 6-12). Therefore, one new DNA strand is synthesized continuously whereas the other grows discontinuously, through the repeated addition of short segments of DNA called **Okazaki fragments**, each usually less than 1000 nucleotides in length. These fragments are joined to the existing strand by **DNA ligase**.

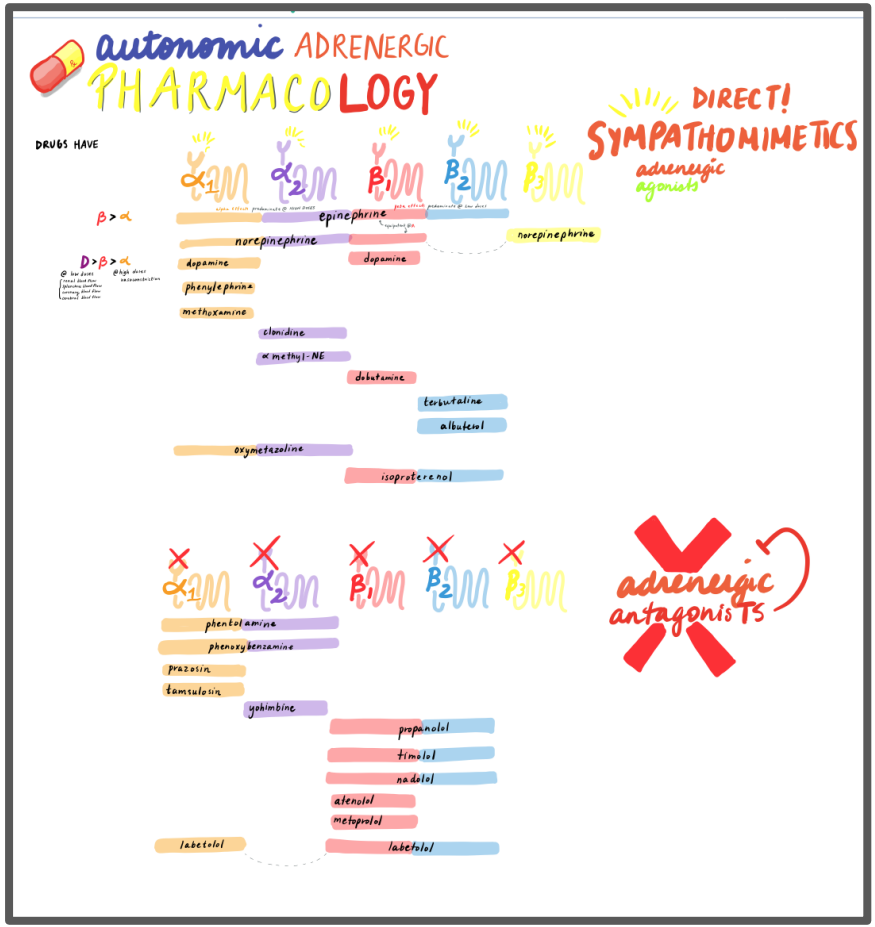
DNA polymerase has an extremely low error rate (~1 error for every 10^7 bases), due its ability to **proofread** for incorrectly incorporated nucleotides. This relies on an a 3'-5' exonuclease function of DNA polymerase, which is independent of its 5'-3' polymerase activity. DNA polymerase can immediately sense if it has added an incorrect nucleotide, remove it via this 3'-5' exonuclease activity, and reinsert the proper nucleotide before continuing.

Unlike RNA polymerase, which functions in transcription, DNA polymerase cannot begin synthesizing a new DNA strand from scratch. Instead, it requires a free 3' end of an existing nucleotide chain. DNA synthesis therefore begins with the synthesis of a ~10 nucleotide RNA strand called a **primer**, by a special RNA polymerase called **primase**. This occurs once at the replication origin on the leading strand, and multiple times on the lagging strand as each Okazaki

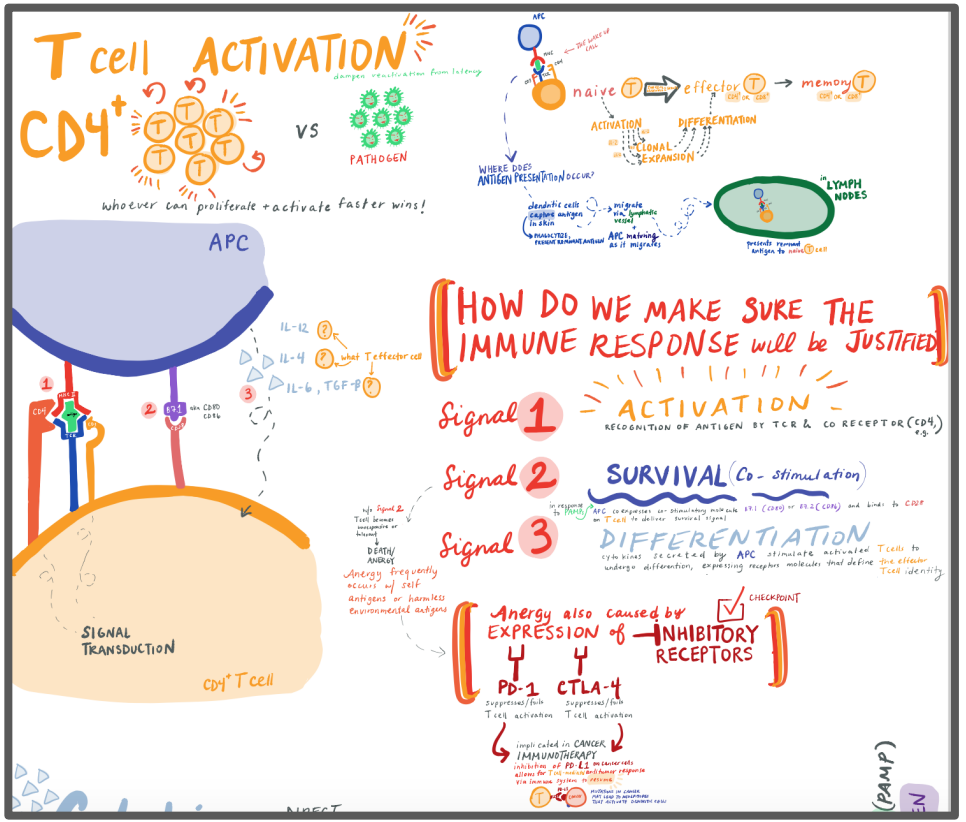




https://armandoh.org/



Most important info is largest.

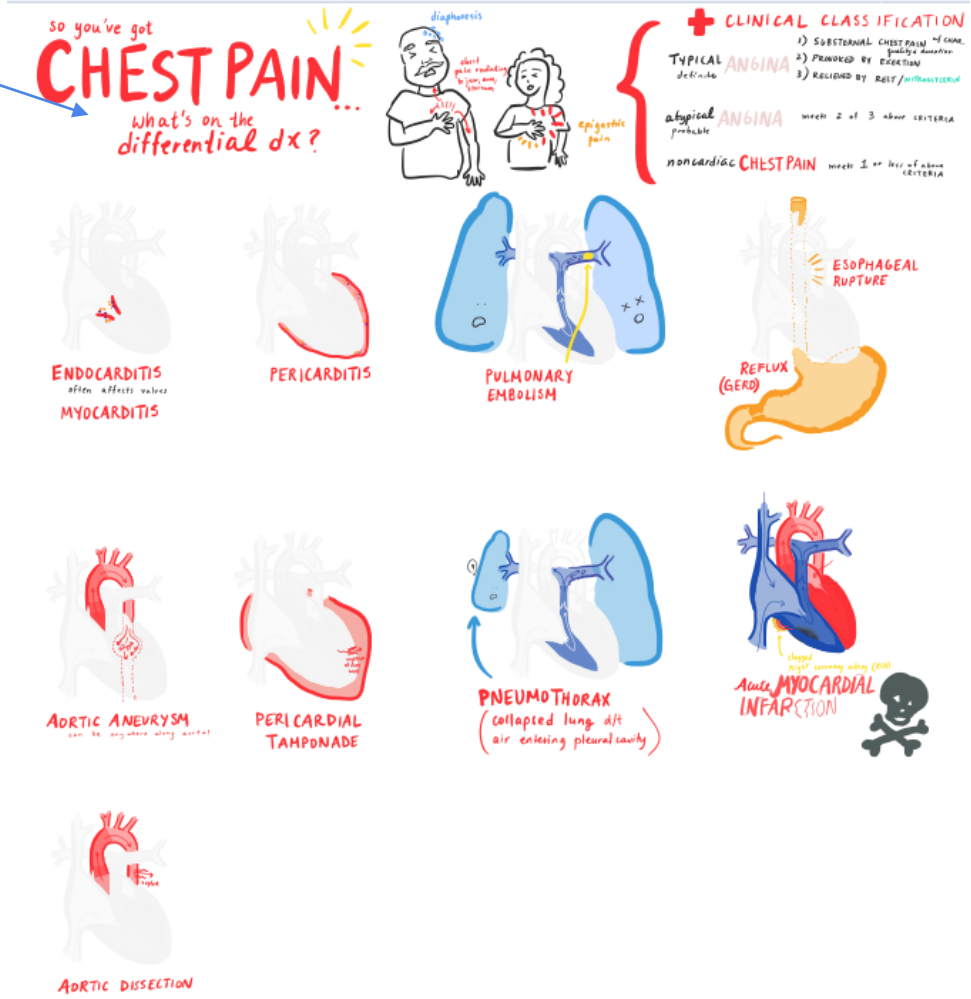


Visual mnemonics - “activated” state vs inhibited state

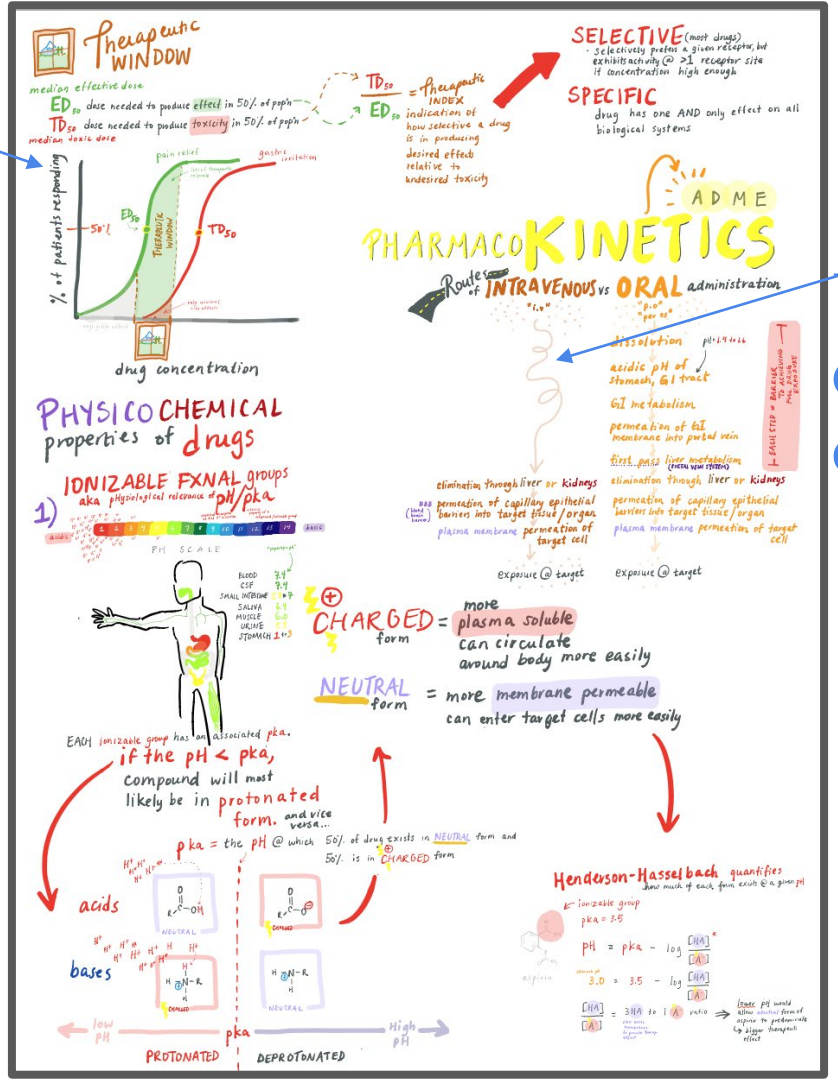
A question that stems from curiosity from a "pre-knowledge" state

Use high contrast color to emphasize, light colors to de-emphasize.

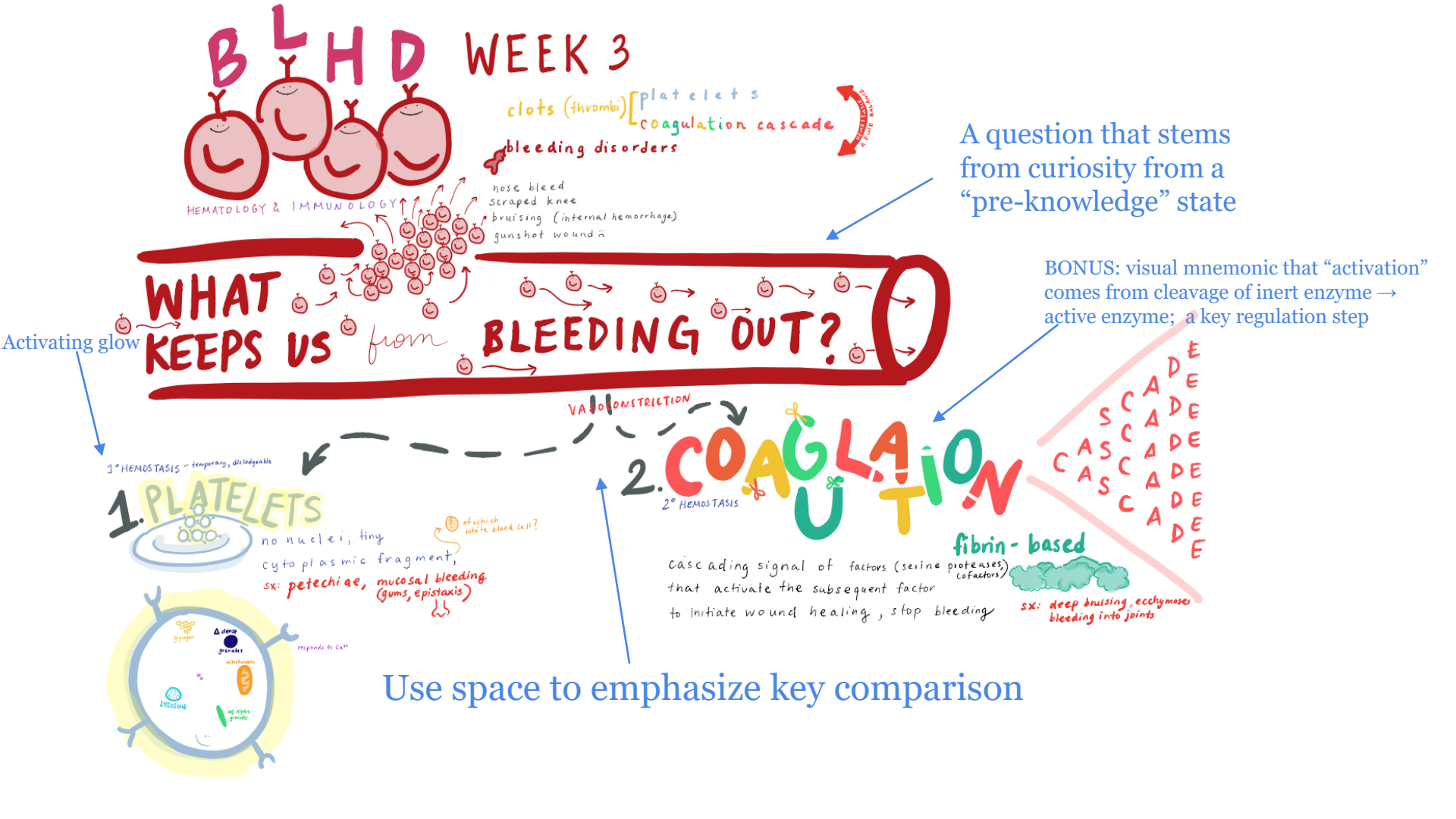
Use the same image template to create consistency and identify distinctions between dx.



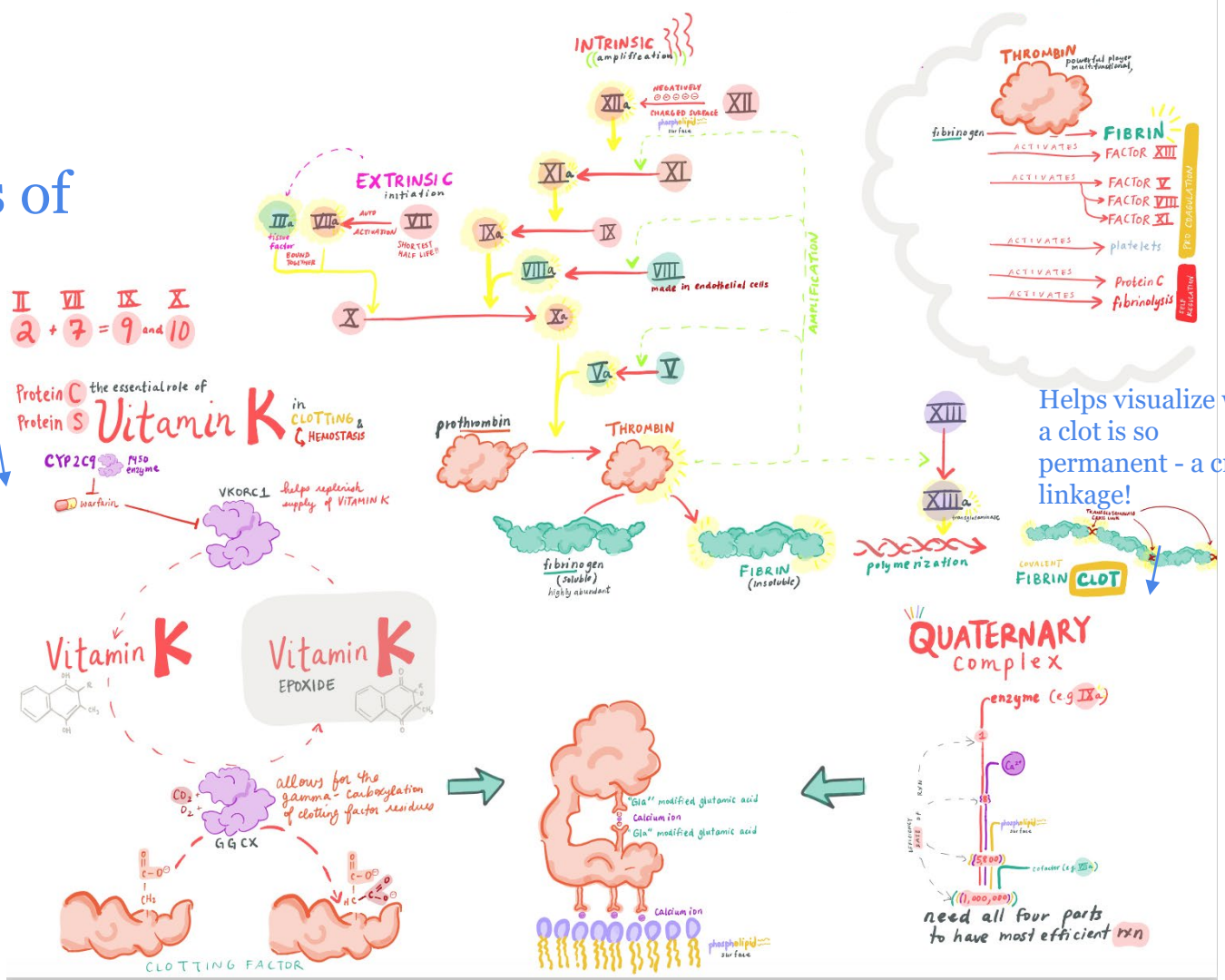
Annotate graphs to highlight critical points, e.g therapeutic “window”



Use space to emphasize key comparison


BLHD WEEK 3
HEMATOLOGY & IMMUNOLOGY
clots (thrombi) [platelets
coagulation cascade
bleeding disorders
nose bleed
scraped knee
bruising (internal hemorrhage)
gunshot wound
WHAT KEEPS US from BLEEDING OUT?
Activating glow
VASOCONSTRICTION
1° HEMOSTASIS - temporary, dislodgeable
1. PLATELETS
no nuclei, tiny cytoplasmic fragment,
sx: petechiae, mucosal bleeding (gums, epistaxis)
of which white blood cell?
2. COAGULATION
2° HEMOSTASIS
cascading signal of factors (serine proteases, cofactors) that activate the subsequent factor to initiate wound healing, stop bleeding
fibrin-based
sx: deep bruising, ecchymoses, bleeding into joints
CASCADE
glycogen
granules
mitochondria
LYSOSOME
responds to Ca++
A question that stems from curiosity from a "pre-knowledge" state
BONUS: visual mnemonic that "activation" comes from cleavage of inert enzyme → active enzyme; a key regulation step
Use space to emphasize key comparison

Proximity contextualizes disparate pieces of information



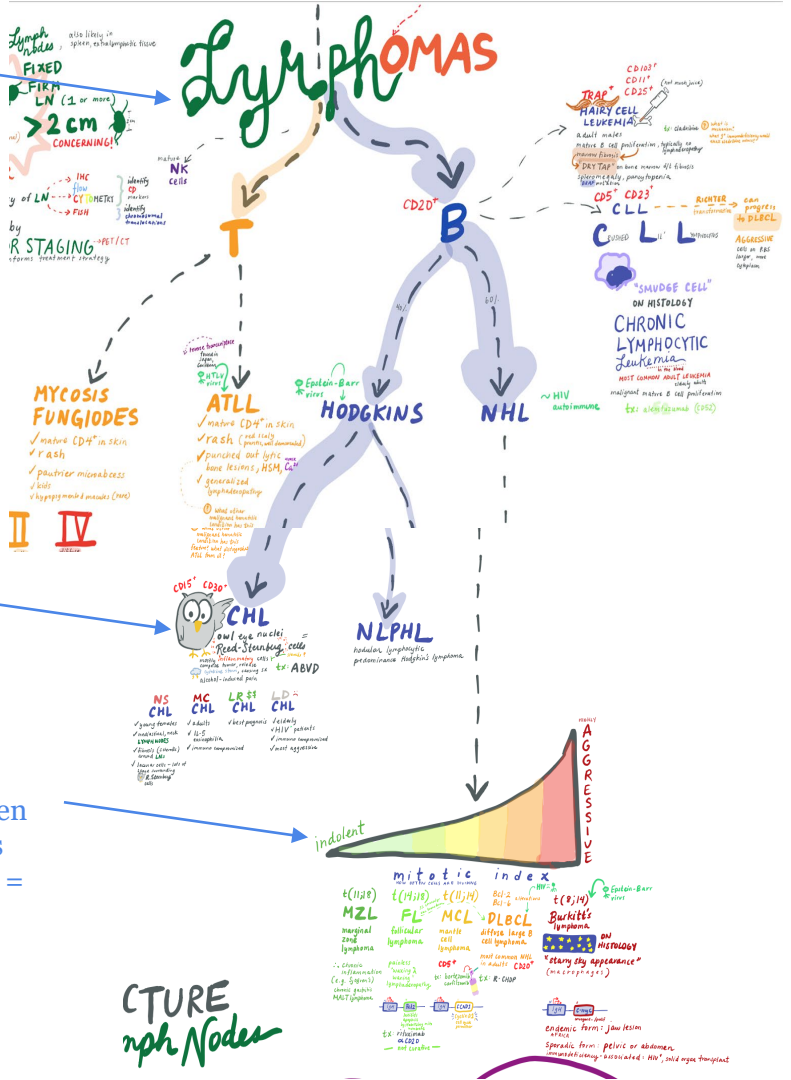
Helps visualize why a clot is so permanent - a cross linkage!

Lymph node visual mnemonic

Proximity contextualizes disparate pieces of information: roadmap diagram helps understand prevalence and how to orient and organize hematologic disease

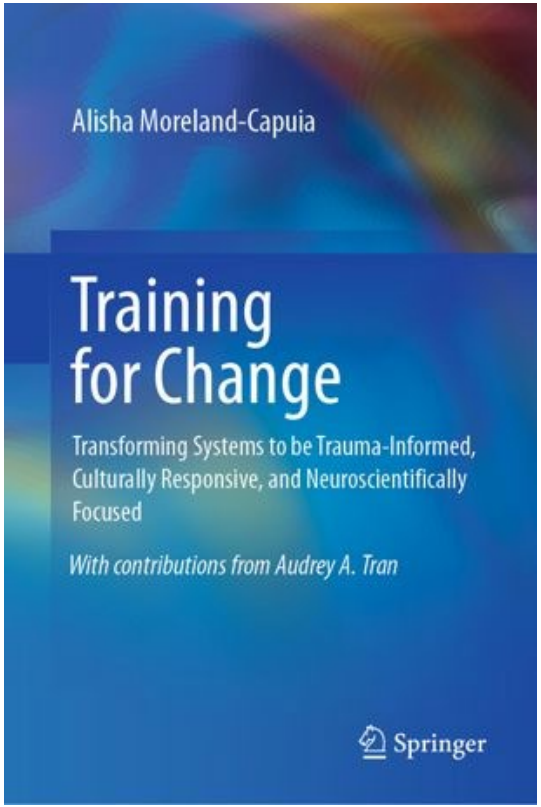
Owl eyes… visual mnemonic

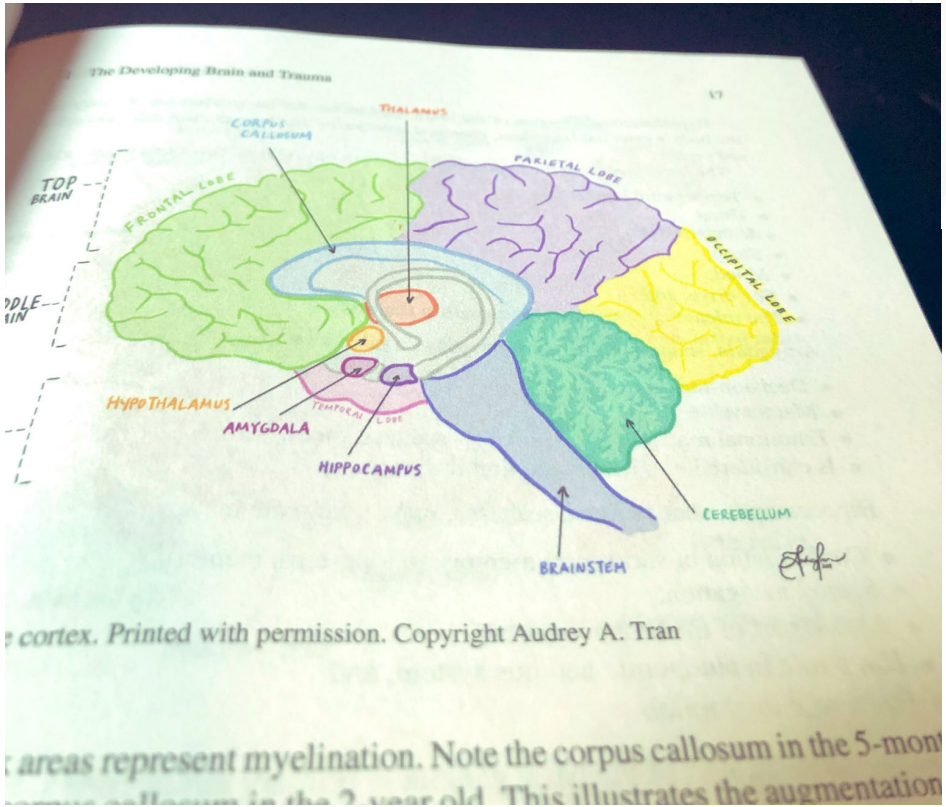
Color coding (green = benign) helps us see that indolence = low rate of cancer cell division



Trauma Informed Oregon @tioregon · Nov 21, 2019

It arrived and I can't wait to dive in. #traumainformed #systemchange @DralishaMD. The art already has me hooked!





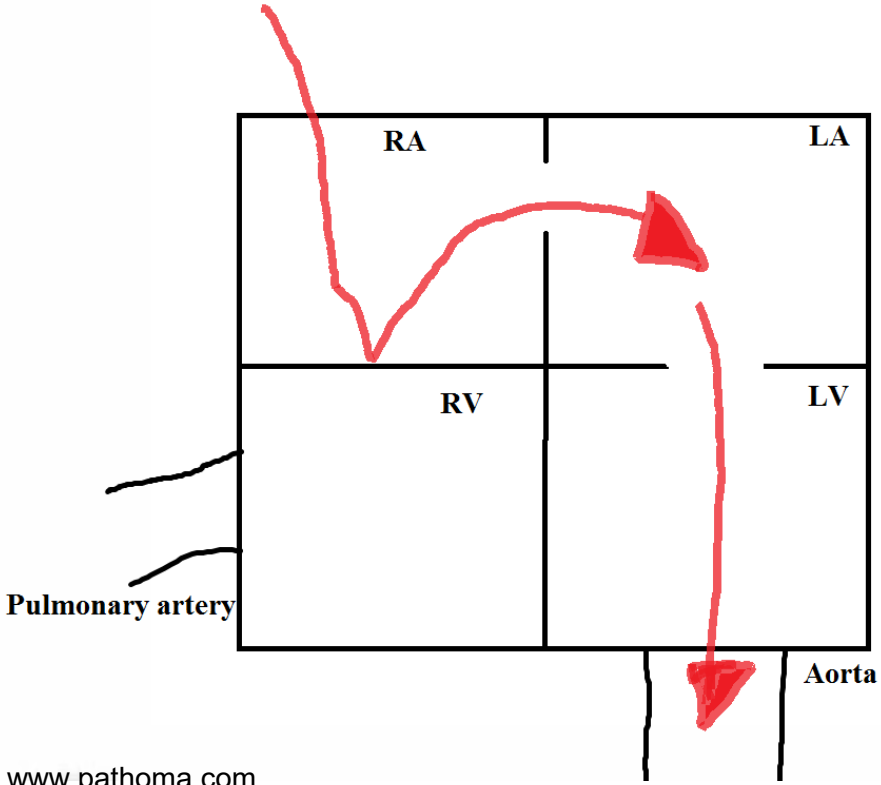
Benefits of applying graphic narrative to education

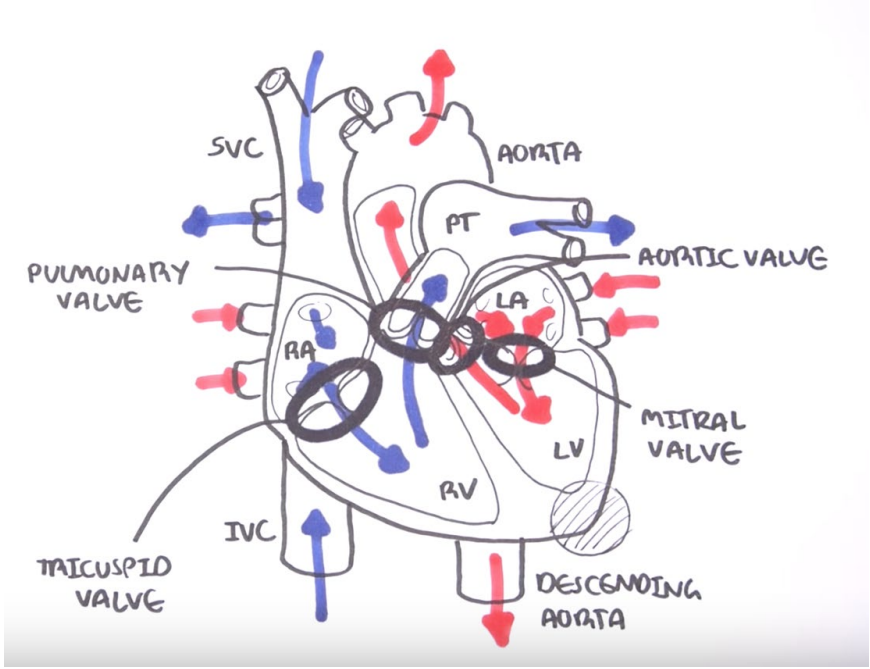
- Can help students understand the full scope of expectations “at a glance”
- Can help students learn through visual recall
- Can help students make key associations that are more “obvious” to seasoned researchers
- Images are more uniquely memorable than tables or study guides
- Particularly attractive and engaging for visual learners

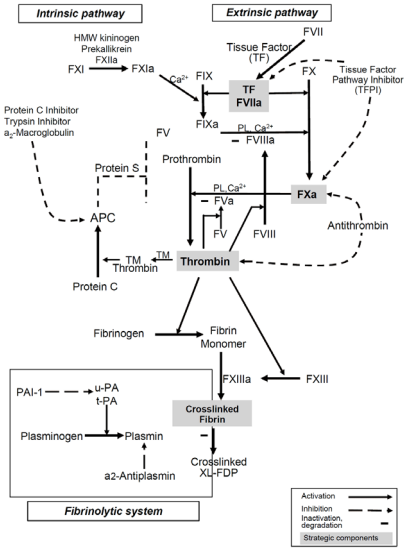
Drawbacks of applying graphic narrative to education

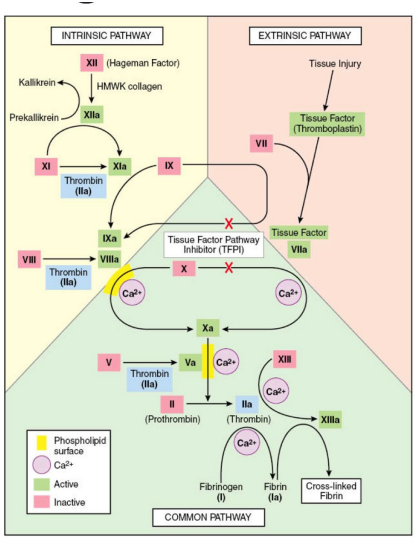
- Time-consuming
- Takes a certain level of drawing skill

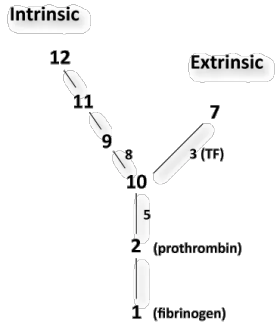
Simple works:
don't have to be an artist, just a communicator











accuracy
facts
details
footnotes

engagement
readership
takeaways
streamlined

Tradeoff

Simple vs simplistic

Easy to memorize vs. **memorable**

Accuracy vs. relevance

Detailed vs. disorienting

Learning Objectives

- Understand role of Graphic Narratives in Interprofessional medical education
- How to apply graphic narrative techniques – premedical education (A Tan)
- **Access Graphic Narrative educational materials in the BICC: (P Pierce)**
- Use Interprofessional Graphic Narratives as teaching tools (M Osborne)
- Identify Graphic Narrative techniques useful in your educational portfolio

Graphic Medicine at the OHSU Library

DATE: Feb. 5, 2020 WRITTEN BY: Pam Pierce,
Digital Scholarship & Repository Librarian

OHSU Librarians,


Photo credit: B[illegible] Delawska-Elliott

Contacting the OHSU Library

- https://www.ohsu.edu/library
- Contact Us
- library@ohsu.libanswers.com
- Schedule an appointment with a librarian at BICC, RLSB or virtually
- 503-494-3460 (Service Desk: M-F, 8am – 6pm)

Graphic Medicine Resources

LibGuide describing books is available at: http://libguides.ohsu.edu/graphicmedicine/novelsatOHSU.

***Fertility and abortion**

***Cancer /Neoplasms**

*Mental Health

***HIV/AIDS**

Graphic Medicine and Instruction

- Visuospatial and motor skills
- Empathetic problem solvers
- Creativity as a means of getting students connect with material they wouldn't otherwise engage with
- Taking risks and failing

Library
About
Library Search
Using the Library
Services
- Borrow and Request
- Get It For Me Service (Interlibrary Loan)
- Request Forms
- Scholarly Communication & Data Services
- Workshops
- Copyright
- Theses, Dissertations, Capstones, & Portfolios
- Course Reserves
- Library Tutorials

Data
My Library Account
Contact the Library

Get It For Me Service

(interlibrary loan/document delivery service)

OHSU Users: Log into Get It For Me Account

Non-OHSU Users: please visit this page for document delivery requesting services.

Get It For Me FAQ

- **What is it?**
  OHSU Library's Get It For Me service is the combination of services also known as interlibrary loan and document delivery. The service allows users to request material either owned or not owned within the OHSU Library collection. Get It For Me is a service provided at no charge to OHSU credentialed users (faculty, residents, staff, emeritus and students). If you are a Non-OHSU user and are interested in requesting items through OHSU Library, please visit this page.

- **How do I make a request?**
  Learn how to make a request *here*.

- **How much does it cost?**
  Get It For Me service is provided at no cost to OHSU faculty, residents, staff, emeritus and students.

- **How long does it take to receive items?**
  PDFs typically arrive within 1-3 business days. Physical items typically arrive within 1-3 weeks depending on availability.

- **How do I ask for a rush service?**
  After submitting your request, please follow up with an email libdoc@ohsu.edu or a phone call 503-494-3460 so that we can expedite it.

- **Do I have to enter each request manually?**
  While a separate request must be made for each item you need, if you are using a database like PubMed or Scopus to search for citations, look for the link resolver 'Find It @OHSU Library' button at the top right of your screen. The link resolver 'talks' to our catalog and if it determines that we don't own what you are looking for, you can click on the 'Request via Get It For Me service' link at the bottom of the catalog record and a request will auto-populate for you.

- **Are there limitations or restrictions on what I can request?**
  We will not fill requests for textbooks and leisure/recreational materials—often those items can

Learning Objectives

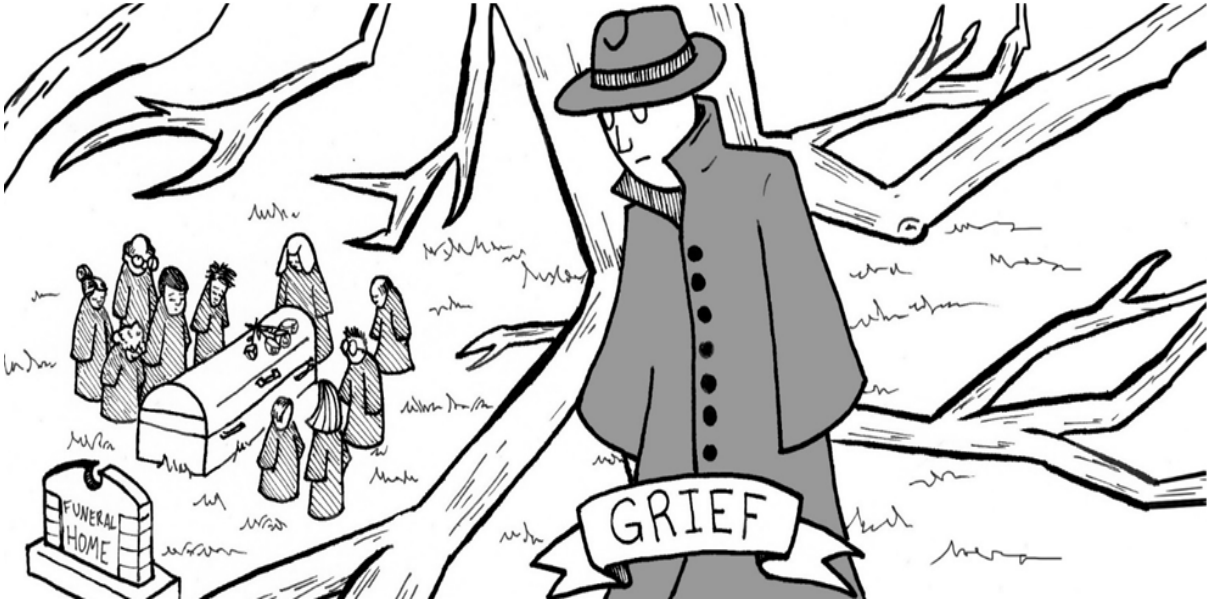
- Understand role of Graphic Narratives in Interprofessional medical education
- How to apply graphic narrative techniques – premedical education (A Tan)
- Access Graphic Narrative educational materials in the BICC: (P Pierce)
- **Use Interprofessional Graphic Narratives as teaching tools (M Osborne)**
- Identify Graphic Narrative techniques useful in your educational portfolio

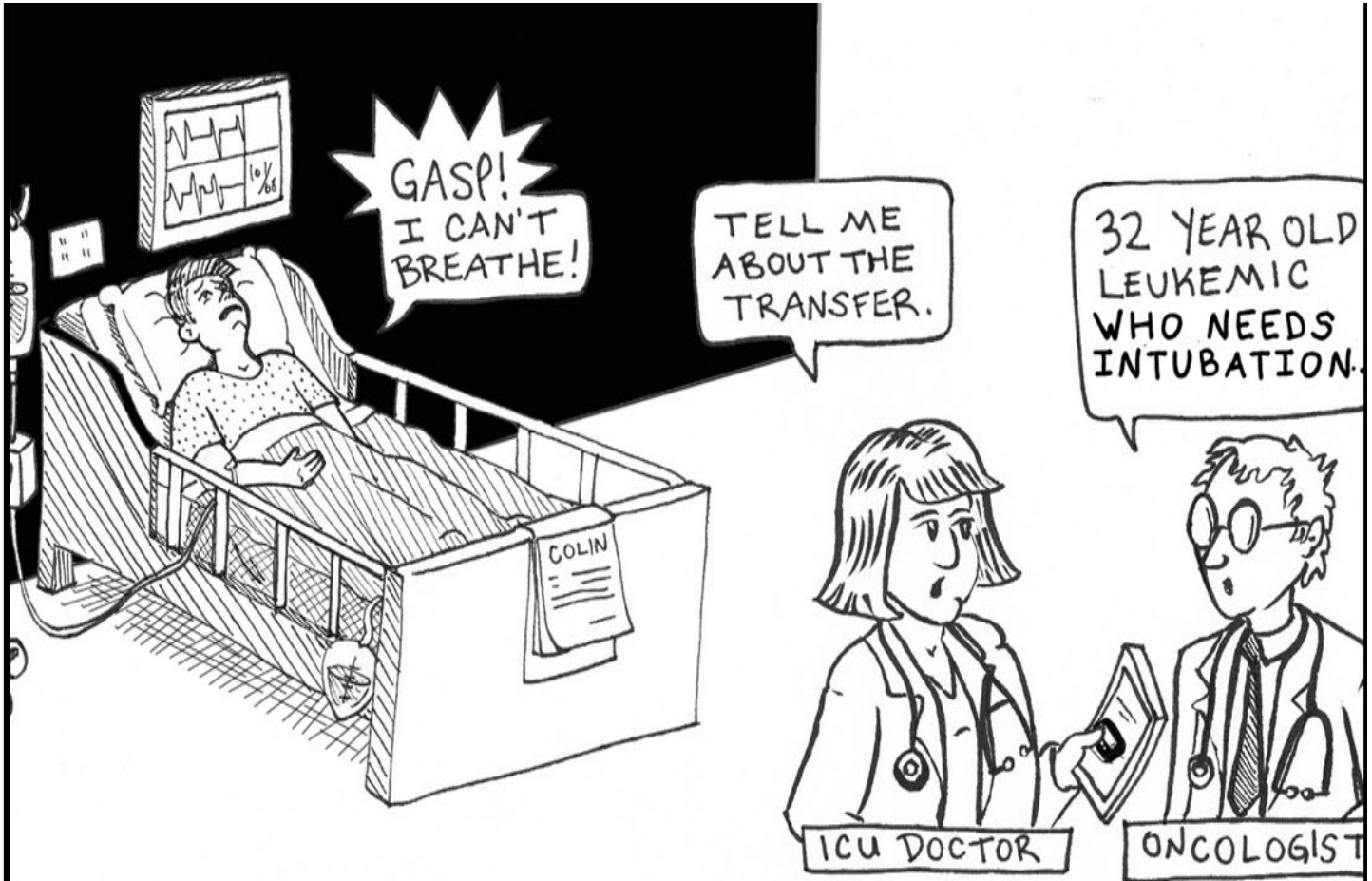
Graphic narrative of ethics/ futility

'Critical Space' is a published graphic narrative addressing futility in the Intensive Care Unit (ICU)

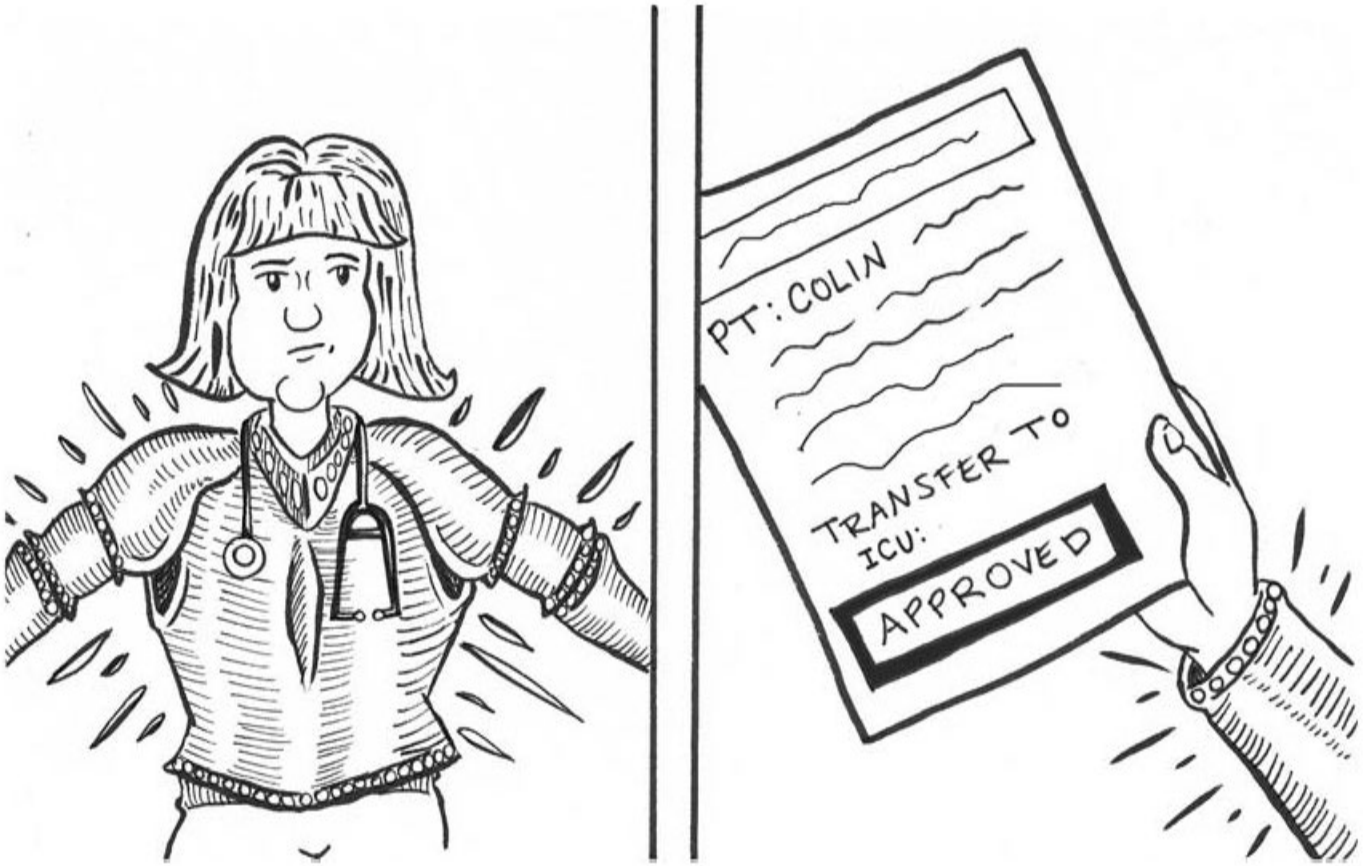
Discussion topics for interprofessional teaching

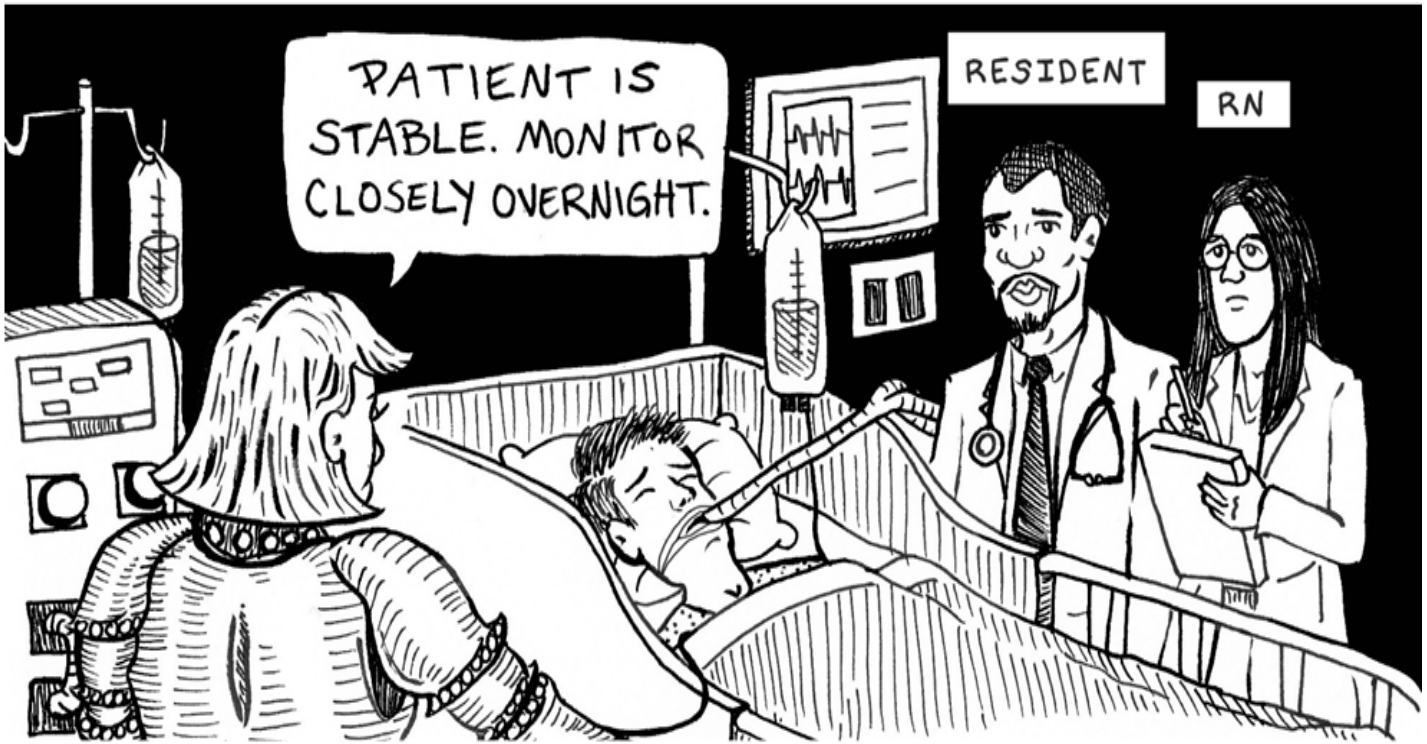
- What are the ethical dilemmas?
- Is the care futile?
- How is grief addressed?
- How are decisions made and conveyed to family?
- How is the medical hierarchy conveyed?


FUNERAL HOME
GRIEF


GASP! I CAN'T BREATHE!
COLIN
TELL ME ABOUT THE TRANSFER.
32 YEAR OLD LEUKEMIC WHO NEEDS INTUBATION.
ICU DOCTOR
ONCOLOGIST


WE'VE ALREADY DECIDED. FAMILY EXPECTS TRANSFER TO THE ICU.
o0
SIGH... THIS IS A DISASTER.


PT: COLIN
TRANSFER TO ICU:
APPROVED


PATIENT IS STABLE. MONITOR CLOSELY OVERNIGHT.
RESIDENT
RN


WE WON'T BE ABLE TO PULL HIM THROUGH. WE'RE TORTURING HIM...
RESIDENT
RN


6AM - MORNING ROUNDS
BRAIN HERNIATION. NOTHING SURGICAL HERE...
ICU TEAM
NEUROSURGEON


SURGERY WON'T HELP...
I WORKED IN AN ICU. YOU NEED TO GET AN MRI, EEG, AND CT SCAN!


WE'VE PULLED HIM THROUGH THE ICU THREE TIMES!

Graphic narrative of ethics/ futility

'Critical Space' is a published graphic narrative addressing futility in the Intensive Care Unit (ICU)

Discussion topics for interprofessional teaching

What are the ethical dilemmas? *Beneficence, autonomy*

- Is the care futile? *It depends on the perspective*
- How is grief addressed? *Grey figures of grief*
- How are decisions made and conveyed to family? *Oncologist, ICU doctor*
- How is the medical hierarchy conveyed? *Armor, moral distress/nursing*

Learning Objectives

- Understand role of Graphic Narratives in Interprofessional medical education
- How to apply graphic narrative techniques – premedical education (A Tan)
- Access Graphic Narrative educational materials in the BICC: (P Pierce)
- Use Interprofessional Graphic Narratives as teaching tools (M Osborne)
- **Identify Graphic Narrative techniques useful in your educational portfolio**

Identify Graphic Narrative techniques in your educational portfolio

Take several min to talk in small groups – *possible topics*

- Ways graphic narrative techniques could be used in your work
- Challenges to using graphic narrative techniques
- Innovative approaches to using graphic narratives

In summary

- The use of graphic narratives in education is increasing
- Graphic narratives can be used as
    - study materials
    - Teaching materials
    - Presentations with topics ranging from ethics to clinical medicine
- BICC has materials supporting graphic narratives in education

Thank You