Transforming Nursing Education through Artificial Intelligence

Exploring Benefits, Challenges, and Future Directions

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Objectives

- Introduction into current uses of AI in Nursing Education
- The pros and cons of using Artificial Intelligence
- Educators' hesitations towards the use of AI
- Applications you can currently use

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Introduction to AI in Nursing Education

AI in nursing education encompasses various technologies and applications designed to enhance and transform traditional teaching methods, aiming to make education more personalised, efficient, and effective. [1]

Current

Creating simulated clinical scenarios, providing personalised learning experiences, to deliver tailored content, adaptive assessments, and customised scenarios.[2]

AI can be integrated into electronic medical records (EMRs) to automate the identification of patients at risk for sepsis or potential deterioration.

1. Glauberman, G., Ito-Fujita, A., Katz, S., & Callahan, J. (2023). Artificial Intelligence in Nursing Education: Opportunities and Challenges. Hawai'i journal of health & social welfare, 82(12), 302–305
2. Couper AL. Challenges and opportunities of artificial intelligence in nursing education. J Nurs Rep Clin Pract. 2025;3(2):213-215..

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Currently being used at RMIT

- Summarise documents and information.
- Generate images, diagrams and graphs based off prompts.
- Use Val to help you explore ideas related to a particular topic.
- Val can act as a tutor, help you understand maths, roleplay a scenario, quiz you on your study notes and more.

https://www.rmit.edu.au/students/support-services/study-support/val#new-val

Advantages of AI in Nursing Education

Personalised learning- AI can tailor educational experiences to individual student needs, **learning styles, and pace**.

This involves analysing student data, such as **learning patterns and strengths**, to create customised lesson plans and resources. AI can also provide targeted interventions for students struggling with specific concepts. [6]

AI-enhanced simulations and virtual reality can create realistic clinical scenarios that provide hands-on experience without the risks associated with real-life clinical settings. [4]

Real time feedback- AI systems offer immediate feedback on performance. This allows for quick adjustments and continuous improvement in skills. [5]

4. Couper AL. Challenges and opportunities of artificial intelligence in nursing education. J Nurs Rep Clin Pract. 2025;3(2):213-215
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Disadvantages of AI in Nursing Education

- Ethical Concerns and Bias [8]
- Data Privacy and Security
- Accountability and Trust - who is responsible for when it is wrong?
- Resistance to Adoption[9]
- Implementing AI in nursing education requires significant investment in technology and infrastructure $$$$ [10]
- Educators need to be trained to use AI tools effectively, and there must be ongoing support to address technical issues as they arise. [7]

7. Srinivasan M, Venugopal A, Venkatesan L, Kumar R Navigating the Pedagogical Landscape: Exploring the Implications of AI and Chatbots in Nursing EducationJMIR Nursing 2024;7:e52105 doi: 10.2196/52105
8. Couper AL. Challenges and opportunities of artificial intelligence in nursing education. J NursRep Clin Pract. 2025;3(2):213-215.
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Educators' hesitation

- A potential threat from AI to the nursing workforce lies in the concern that AI might replace human employees due to its convenience and lower cost.

- Resistance to adopting AI technologies among faculty and students who may prefer traditional teaching methods or are unfamiliar with new technologies.

- Integrating AI into existing curricula and teaching methods can also be complex and time-consuming, requiring careful planning and coordination.

- Lack of sufficient training for educators in using AI tools effectively.

4. Couper AL. Challenges and opportunities of artificial intelligence in nursing education. J Nurs Rep Clin Pract. 2025;3(2):213-215

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latest trends in car-t therapy

Expanded question: Latest trends in *chimeric antigen receptor T-cell* therapy

Recent advancements in chimeric antigen receptor (CAR) T-cell therapy have focused on enhancing efficacy, expanding indications, and improving safety profiles.

One significant trend is the development of **next-generation CAR constructs**. These include universal CARs, which can target multiple tumor antigens simultaneously, and dual CARs, which enhance anti-tumor activity and reduce the risk of antigen escape. Additionally, SUPRA CARs and CARs activated by external stimuli (e.g., light, heat) are being explored to provide more controlled and precise therapeutic effects.[1]

Allogeneic CAR-T cells are another emerging trend. These "off-the-shelf" products, derived from healthy donors, aim to overcome the limitations of autologous CAR-T cells, such as lengthy manufacturing times and variability in product quality. This approach could make CAR-T therapy more accessible and reduce costs.[2]

Biomaterials are being integrated into CAR-T therapy to enhance manufacturing processes, improve targeted delivery, and facilitate real-time in vivo monitoring. These innovations aim to address the challenges of solid tumor targeting and improve the overall therapeutic index of CAR-T cells.[3]

mRNA-based CAR-T cells represent a novel approach, enabling in vivo generation of CAR-T cells without the risk of transgene integration. This method holds promise for safer and more efficient CAR-T cell production.[4]

Finally, the American Society of Clinical Oncology (ASCO) has provided guidelines for managing immune-related adverse events, such as cytokine release syndrome and neurotoxicity, which are critical for the safe administration of CAR-T therapies.[5]

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   ☆ Leading Journal ⓘ New Research
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   ☆ Leading Journal ⓘ
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   ☆ Leading Journal ⓘ

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Follow-Up Questions

- What are the common patient demographics for chimeric antigen receptor T-cell therapy?
- What are the common side effects of chimeric antigen receptor T-cell therapy?
- Are there any recent advancements in the manufacturing process of chimeric antigen receptor T-cells?

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Practice Guideline

Common side effects of chimeric antigen receptor (CAR) T-cell therapy include:

1. **Cytokine Release Syndrome (CRS)**: This is the most frequent adverse event, with an incidence ranging from 57% to 93%, depending on the specific CAR T-cell product used. CRS is characterized by fever, hypotension, hypoxia, and can progress to multi-organ dysfunction. The American Society of Clinical Oncology (ASCO) provides guidelines for the management of CRS, emphasizing the importance of early recognition and intervention to mitigate morbidity and mortality.[1]

2. **Immune Effector Cell-Associated Neurotoxicity Syndrome (ICANS)**: Occurring in 20% to 70% of patients, ICANS can manifest as confusion, aphasia, seizures, and cerebral edema. ASCO guidelines recommend close monitoring and prompt treatment to manage these neurotoxic effects.[1]

3. **B-cell Aplasia**: This is a direct consequence of CAR T-cell targeting of CD19 on B cells, leading to prolonged hypogammaglobulinemia and increased risk of infections.

4. **Cytopenias**: Prolonged cytopenias, including neutropenia, thrombocytopenia, and anemia, are common and can persist for weeks to months post-infusion.

5. **Infections**: Due to immunosuppression and prolonged cytopenias, patients are at increased risk for bacterial, viral, and fungal infections.

6. **Hemophagocytic Lymphohistiocytosis (HLH)**: Though less common, HLH is a severe hyperinflammatory syndrome that can occur and requires immediate intervention.

7. **Disseminated Intravascular Coagulation (DIC)**: This is a rare but serious complication that can occur in the context of severe CRS.

In addition to the common side effects previously mentioned, other notable adverse events associated with CAR T-cell therapy include:

Tumor Lysis Syndrome (TLS): This occurs due to the rapid destruction of tumor cells, leading to the release of intracellular contents into the bloodstream. TLS can result in hyperuricemia, hyperkalemia, hyperphosphatemia, and hypocalcemia, potentially causing renal failure, cardiac arrhythmias, and seizures.[2-3]

Off-Target Effects: CAR T cells can sometimes target antigens expressed on normal tissues, leading to off-target effects. For example, targeting CD19 can result in B-cell aplasia, which is a prolonged depletion of normal B cells, leading to hypogammaglobulinemia and increased susceptibility to infections.[4]

Anaphylaxis: Although rare, anaphylactic reactions can occur, particularly in response to the murine components of the CAR construct. This necessitates close monitoring during and after infusion.[2]

Cardiovascular Toxicities: These include arrhythmias, myocardial infarction, and heart failure, which may be secondary to severe CRS or direct cardiotoxic effects of the therapy.[5]

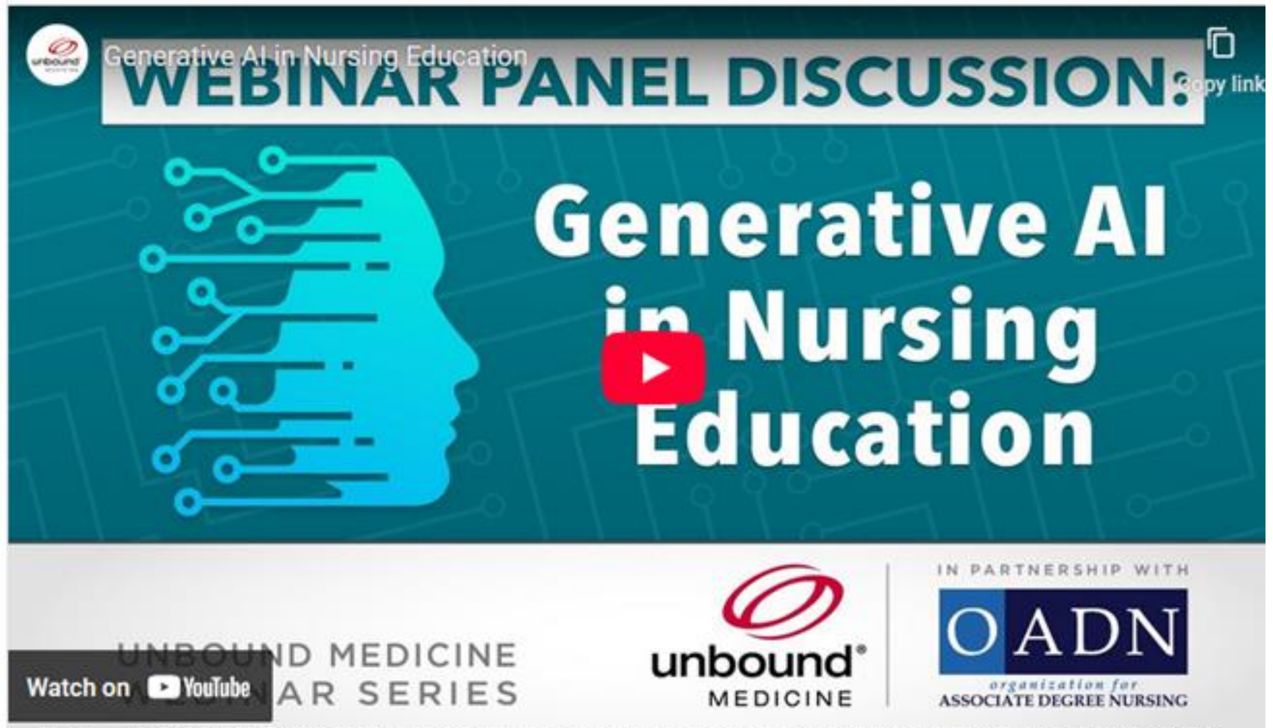
Pulmonary Toxicities: Pulmonary complications such as hypoxia and acute respiratory distress syndrome (ARDS) can occur, often in the context of severe CRS.[5]

Renal and Hepatic Toxicities: Renal dysfunction can result from TLS or CRS, while hepatic toxicities may manifest as elevated liver enzymes or liver failure.[5]

Unriddle.ai

Unriddle AI is an artificial intelligence tool designed to assist researchers by quickly summarising and understanding information from documents like research papers, allowing users to find key insights and write more efficiently, particularly when conducting literature reviews.

Generative AI in Nursing Education



55:32 series but that Odin itself as an organization of course is just a reflection of the community and as such um the use of AI and the um the policies around it will become you know important to everyone to figure out including a Professional Organization so if you have any interest we'll we'll see if you have

55:53 any interest in engaging at that level um as you know some of us work with us uh and Odin on the virtual simulation committee we've been doing that since the pandemic started trying to help people find virtual simulation products that they can use to uh substitute for clinical time in the days when clinical

56:11 time was constrained and finally concluding thoughts um you know it's just like any other change you know stay informed and engaged we would encourage it I think it can be fun and not daunting and as you heard from our wonderful panelists

56:30 experiment and also evaluate uh it's better to be in the Stream than to be watching from the shore and we hope that you'll jump in thanks for being with us today and until next time take care

Summary

The webinar on "Generative AI and Nursing Education," moderated by Bill Deber, explored the integration of generative AI in nursing education. Panelists Dr. Kim Aqua Viva and Dr. Justin Font discussed AI's potential in enhancing scenario-based learning, research, and service. A survey revealed that 67% of respondents had never integrated AI into teaching, indicating a need for guidance. Key applications include creating simulations and...

Quick actions	Suggested questions
Breakdown	How does generative AI challenge traditional methods of nursing education and assessment?
Practice questions	In what ways can generative AI enhance scenario-based learning in nursing programs?
Study guide	What ethical considerations arise from using AI-generated content in nursing education?
	How can nursing educators ensure the accuracy of AI-generated information in their teaching?
	What are the potential biases in AI tools, and how might they affect nursing education?

How does generative AI challenge traditional methods of nursing education and assessment?

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Unriddle

Generative AI presents both challenges and opportunities that are transforming traditional nursing education approaches. Educators are shifting from viewing AI as a cheating threat to recognizing it as a tool that requires proper integration into teaching methods 20:39 .

The technology challenges conventional education by enabling:

1. Personalized Learning
   - Customization of learning materials to meet diverse student needs 13:41
   - Creation of dynamic scenario-based learning experiences 14:12
2. Teaching Efficiency
   - Assistance with lesson planning and activity development 20:21
   - Generation of simulations and virtual patient cases 14:12
   - Support for literature reviews and research processes 41:56

However, educators must carefully consider quality control, as AI-generated content can be "terribly boring" and requires critical evaluation 22:55 . Success depends on using AI to facilitate learning objectives while maintaining transparency with students about its use 20:21 .

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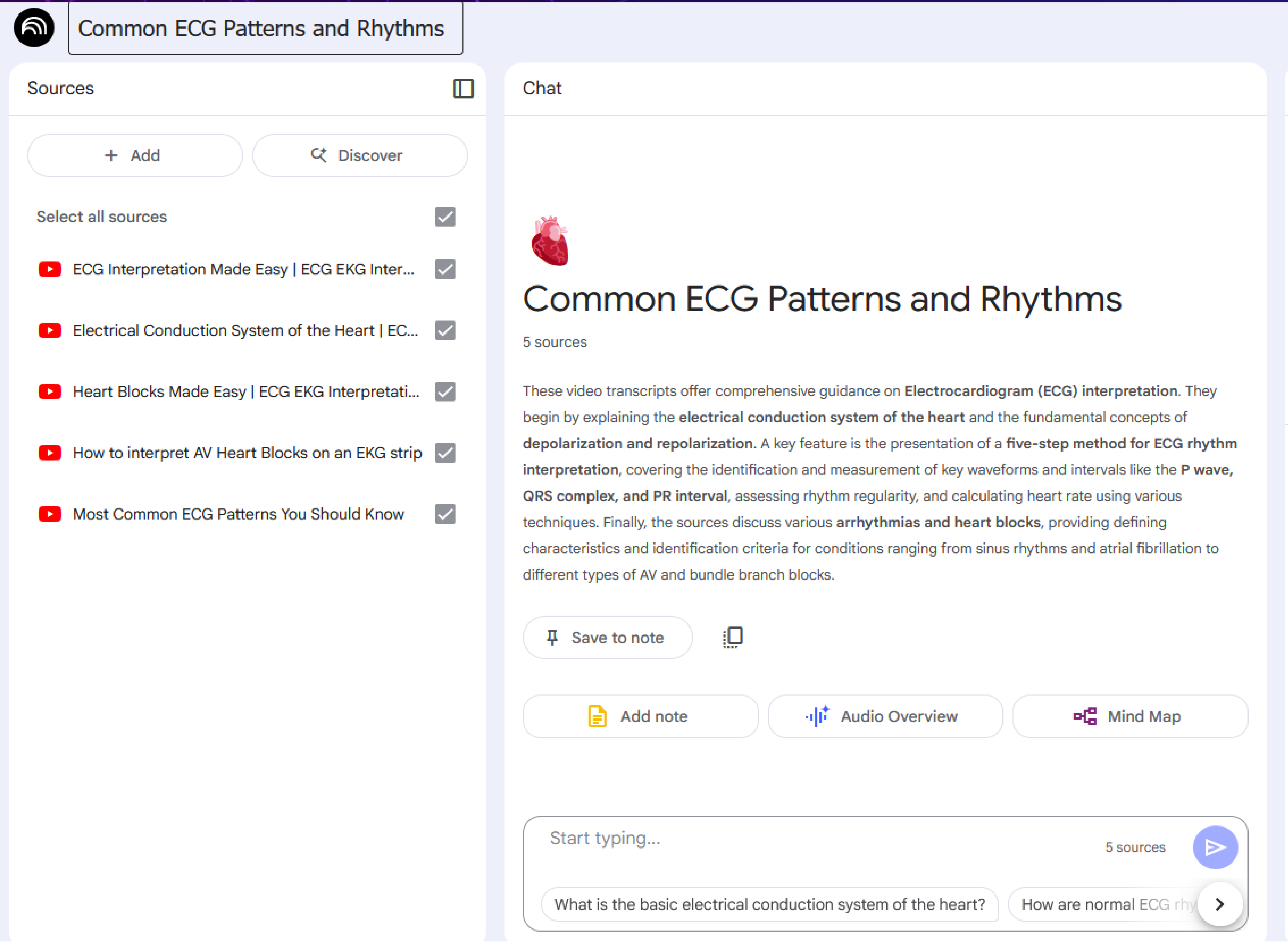

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Study guide | Briefing doc
FAQ | Timeline

ECG Interpretation: Basics and Key Blocks
What is the basic grid paper used for ECG interpretation, and what do the boxes represent? The ECG uses grid paper where every fifth...

ECG Interpretation Guide and Rhythms
ECG/EKG Interpretation Study Guide I. Understanding the ECG Grid Paper Small Box: Represents 0.04 seconds. Large Box: Composed o...

. **Common ECG Rhythms and Patterns**

- **Sinus Bradycardia:** Sinus rhythm with a heart rate < 60 bpm.
- **Sinus Tachycardia:** Sinus rhythm with a heart rate > 100 bpm.
- **Atrial Fibrillation (Afib):** Chaotic electrical activity in the atria. No clear P waves (may see fibrillatory waves), irregularly irregular ventricular rhythm (irregular R-R interval), and a narrow QRS complex (unless a bundle branch block is also present).
- **Atrial Flutter (Aflutter):** Coordinated electrical activity in the atria due to a re-entry circuit. Classically shows a "sawtooth" pattern (flutter waves, inverted P waves in inferior leads) in the baseline, regular atrial rate (around 300 bpm), and typically a narrow QRS complex. May have a consistent conduction ratio (e.g., 2:1, 3:1) or variable conduction, leading to a regular or irregular ventricular rhythm.
- **Premature Contractions:** Beats that originate from an irritable focus outside the normal conduction pathway.
  - **Premature Atrial Contraction (PAC):** Originates in the atria. Seen as an abnormal P wave morphology followed by a narrow QRS complex. May appear to cause a pause.
  - **Premature Ventricular Contraction (PVC):** Originates in the ventricles (His-Purkinje system). Appears as a wide QRS complex (> 0.12 seconds) with no preceding P wave. Can occur sporadically, every other beat (bigeminy), or in sequences (ventricular tachycardia).
- **Bundle Branch Blocks:** A block in the conduction through either the right or left bundle branch.
  - Diagnosed definitively with a 12-lead ECG, but can be suspected on a bedside monitor (looking at the V lead, corresponding to V1 on a 12-lead).
  - Characterized by a wide QRS complex (> 0.12 seconds).
  - **Right Bundle Branch Block (RBBB):** Terminal positive deflection (upward) in the V lead (V1). May show an rsR' pattern (M-shape) in V1 and a wide S wave in V6 (W-shape). Mnemonic: MaRRow (M in V1, W in V6 for RBBB).
  - **Left Bundle Branch Block (LBBB):** Terminal negative deflection (downward) in the V lead (V1). May show a deep S wave in V1 (W-shape) and a prolonged R

Notebook LLM

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Quiz

Answer each question in 2-3 sentences.

1. Describe the function of the SA node and its role as the heart's pacemaker.
2. What is the significance of the AV node's delay in conducting the electrical impulse?
3. Explain what the P wave and QRS complex represent electrically in the heart.
4. How many seconds does one small box on the ECG grid paper represent, and how is this used in measuring intervals?
5. Using the 6-second method, how would you calculate the heart rate from an ECG strip?
6. What are the key characteristics of a normal sinus rhythm based on the five-step interpretation method?
7. How does a first-degree AV block differ from a normal sinus rhythm based on the PR interval?
8. Describe the key pattern seen in a second-degree AV block Type 1 (Wenckebach).
9. What is the main difference in the P wave and QRS regularity between a second-degree AV block Type 2 and a third-degree AV block?
10. What ECG pattern would you typically see in a right bundle branch block when looking at the V lead (V1 equivalent)?

Quiz Answer Key

1. The SA node is a collection of specialized cells in the right atrium that can depolarize on their own, acting as the heart's natural pacemaker. This depolarization initiates the electrical impulse that spreads throughout the heart, setting the heart rate.
2. The AV node's delay (around 120 ms) in conducting the impulse is vital because it allows time for the atria to fully contract and empty blood into the ventricles before the ventricles begin to contract. This prevents the atria and ventricles from contracting against each other and ensures proper blood flow.
3. The P wave represents the electrical activity of atrial depolarization, which leads to atrial contraction. The QRS complex represents the electrical activity of ventricular depolarization, which leads to ventricular contraction.
4. One small box on the ECG grid paper represents 0.04 seconds. By counting the number of small boxes for a specific waveform or interval (like the PR interval or QRS duration), you can determine its duration in seconds.
5. To use the 6-second method, you would locate a 6-second strip (often marked by hash marks) and count the number of QRS complexes within that strip. You then multiply that number by 10 to get the approximate heart rate in beats per minute.
6. A normal sinus rhythm has upright P waves preceding each QRS complex, a PR interval between 0.12 and 0.20 seconds, a QRS duration less than 0.12 seconds, a regular rhythm (consistent R-R intervals), and a heart rate between 60 and 100 beats per minute.
7. A first-degree AV block differs from a normal sinus rhythm solely by having a prolonged PR interval that is greater than 0.20 seconds. All other aspects, such as the presence of a QRS for every P, QRS duration, and regularity, may be normal.
8. In a second-degree AV block Type 1 (Wenckebach), you see a cyclical pattern where

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