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Continuing Education (NPTA WILL UPDATE SLIDE)

Target Audience: Certified Pharmacy Technicians
Activity Type: Knowledge
Contact Hrs: 1.0 or 0.1 CEU
UAN: 0384-0000-23-006-L04-P/ 0384-0000-23-006-L04-T (live)
 0384-0000-23-006-H04-P/ 0384-0000-23-006-H04-T (on-demand)

Release Date: 02/23/2023 **Exp. Date:** 02/23/2026

Credit:
 To receive credit for this LIVE program, participants must complete an online program evaluation AND submit a request through the designated webform to obtain CE credit.
 To receive credit for this RECORDED program, participants must complete the post-test with a passing score of 70%.

Timothy Aungst serves as a consultant to Otsuka, Teva, Eli Lilly, Akili Interactive, Pear Therapeutics, LevelEx, and GoodRx. He is on Teva and Otsuka Speakers Bureaus.

Accreditation:
 The National Pharmacy Technician Association (NPTA) is accredited by the Accreditation Council for Pharmacy Education (ACPE) as an approved provider of continuing pharmacy education.

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OBJECTIVES

At the completion of this professional continuing education program, the alert attendee should be able to:


- Explain the basic concepts and terminology related to artificial intelligence and its potential applications in the pharmacy setting.
- Describe at least three specific examples of how AI is currently being used in the pharmacy industry.
- Discuss the potential benefits and drawbacks of using AI in the pharmacy setting.
- Identify the ethical considerations related to the use of AI in the pharmacy.
- Discuss the potential future impact of AI on the pharmacy profession and the role of the pharmacy technician in this changing landscape.

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CNN
BuzzFeed says it will use AI to help create content, stock jumps 150%
 BuzzFeed said Thursday that it will work with ChatGPT creator OpenAI to use artificial intelligence to help create content for its audience...
 2 days ago

Vox
Thanks to OpenAI, Microsoft is beating Google in the artificial intelligence game
 The software stalwart's big investment in AI could make it cutting-edge again.
 2 days ago

Forbes
The Dark Side Of ChatGPT
 ChatGPT has been a topic of conversation for the last few months. The artificial intelligence (AI) launched by OpenAI was built in November...
 12 mins ago




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01 WHAT IS AI?

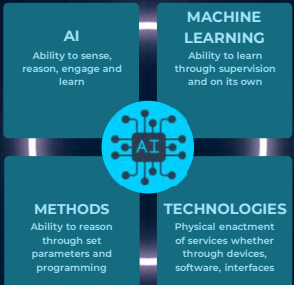
- Artificial intelligence (AI) is an umbrella term for the ability of a computer or software to mimic human behavior and actions
- Other relevant terms that apply to AI:
 - Machine Learning
 - Deep Learning
- How do we apply AI?
 - Natural Language Processing
 - Computer Vision
 - Voice Recognition
 - Knowledge Capture
 - Robotics and Motion
 - Planning and Optimization



[HTTP://SITN.HMS.HARVARD.EDU/FLASH/2017/HISTORY-ARTIFICIAL-INTELLIGENCE/](http://sitn.hms.harvard.edu/flash/2017/history-artificial-intelligence/)
[HTTPS://ATDPS.NET/EN/ARTIFICIAL-INTELLIGENCE](https://atdps.net/en/artificial-intelligence/)

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AI
 Ability to sense, reason, engage and learn

MACHINE LEARNING
 Ability to learn through supervision and on its own

METHODS
 Ability to reason through set parameters and programming


TECHNOLOGIES
 Physical enactment of services whether through devices, software, interfaces

AI

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02 HOW IS AI IMPACTING PHARMACY?


- AI will impact the spectrum of the pharmacy environment across all sectors
 - Pharmaceutical development
 - Precision care
 - Clinical services
 - Pharmacy operations
 - Automation and robotics
 - Omnichannel services
- The current development of AI is relegated towards pilot trials or small-limited integration
- Cost and implementation barriers may pose an issue



Raza et al. Artificial Intelligence (AI) in Pharmacy: An Overview of Innovations. 2022. Pharmacy Practice


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PHARMACY AI APPLICATIONS




OPERATIONS

AI can help the pharmacy with the preparation of medications and for running the pharmacy across multiple environments




BILLING

AI can help aid pharmacy staff in handling billing and payment for medications and adjudication of insurance




CLINICAL

AI can help augment pharmacists and technicians with clinical work including medication reconciliation, counseling, MTM, and more



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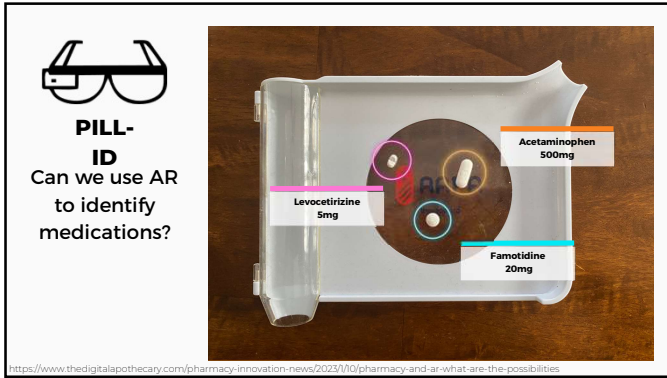
Pharmacy clinical tools can be augmented using AI to supplement the pharmacy teamwork through the EHR and pharmacy management system.



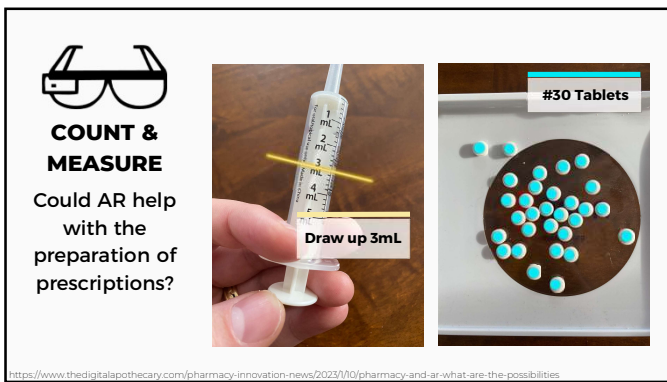
- Clinical decision support system (CDSS)
 - Provide CMM/MTM services
 - Predict and identify renal adjustment dose needs
 - Antimicrobial stewardship
- Optimize doses for therapy
- Monitor stock and inventory
- Integrate with AR/VR technologies

<https://www.pharmacytimes.com/view/artificial-intelligence-applications-in-education-and-pharmacy-practice>

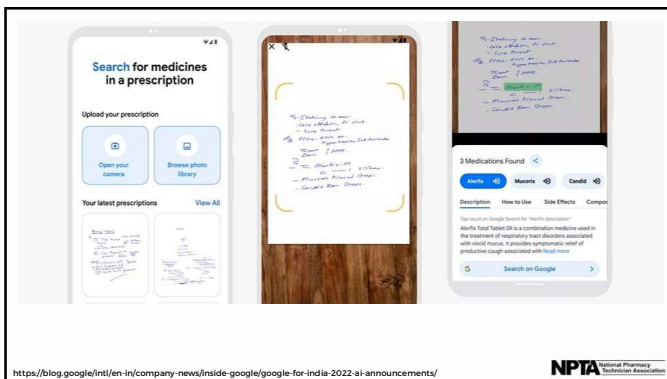
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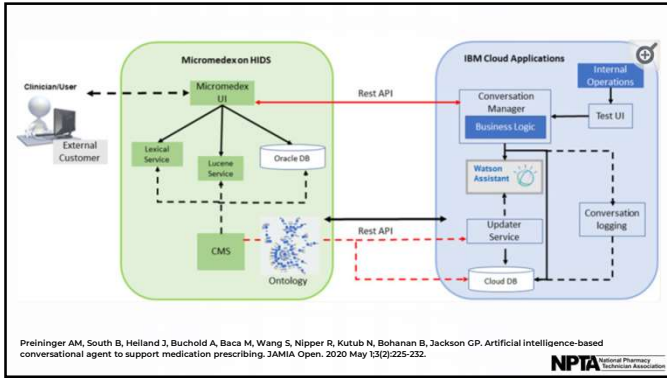
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Provide patient counseling points for atorvastatin

1. Atorvastatin is a medication used to lower cholesterol levels and prevent heart disease.
2. The medication should be taken once daily, at the same time each day, with or without food.
3. It is important to have regular blood tests to check liver function while taking atorvastatin.
4. Atorvastatin can interact with other medications, including some antibiotics, so it is important to inform your healthcare provider of all medications and supplements you are taking.
5. Common side effects include stomach pain, constipation, diarrhea, and headache. If these side effects are severe or persistent, contact your healthcare provider.
6. Atorvastatin can cause muscle pain and weakness, so it is important to contact your healthcare provider if you experience these symptoms.
7. Atorvastatin can also cause memory loss or confusion in rare cases, so it is important to inform your healthcare provider if you experience any changes in cognitive function.
8. Women who are pregnant or breastfeeding should not take atorvastatin.
9. Atorvastatin should not be used in combination with certain medications, such as niacin and fibrates, so it is important to consult your healthcare provider before starting any new medications.

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Provide a script to educate a patient with low-health literacy on atorvastatin. Include topics such as what is for, how to take it, side effects, and what to self-monitor for.

"Hello, my name is [Your name] and I am here to talk to you today about the medication you have been prescribed, atorvastatin.


Atorvastatin is a medication that is used to lower your cholesterol levels in your blood. High cholesterol levels can lead to blockages in your heart and blood vessels, which can lead to heart attacks and strokes. By taking atorvastatin, we can help lower your risk of these serious health problems.

To take atorvastatin, you will need to take one tablet once a day, either with or without food. It is important that you take the tablet at the same time each day, so it is easy to remember when to take it.

Like all medications, atorvastatin can have some side effects. The most common side effects include stomach pain, constipation, diarrhea, and headaches. If these side effects are severe or persistent, please contact your healthcare provider.

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PROS

- Personalized care for patients
- Reduction in overhead cost
- More efficiency in work and outputs
- Augmented labor force
- Expanded service for wider populations

CONS

- Cost of services and products
- Bias in AI
- Applicability in certain populations may be limited
- Staff education
- Resistance by workforce
- Alert fatigue with CDSS
- Tech support
- Reimbursement


Curtain C, Peterson GM. Review of computerized clinical decision support in community pharmacy. J Clin Pharm Ther. 2016;39(6):743-748.

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04 WHAT ARE THE ETHICAL IMPLICATIONS?


- Large concern is building regarding the ethical use of AI in society.
 - Who is at fault for a car on autopilot?
 - What data is appropriate to use from a persons shopping habits?
 - What regulations are in place?



Naik N, Hameed BMZ, Shetty DK, Swain D, Shah M, Paul R, Aggarwal K, Ibrahim S, Patil V, Smriti K, Shetty S, Rai BP, Chhota P and Somani BK (2022) Legal and Ethical Consideration In Artificial Intelligence In Healthcare: Who Takes Responsibility? Front. Surg. 9:862322.

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Current Concerns on AI

- Bias of AI
- Cybersecurity
- Accountability
- Transparency
- Inclusion
- Robot Rights
- Planning
- Cognitive Services

Naik N, Hameed BMZ, Shetty DK, Swain D, Shah M, Paul R, Aggarwal K, Ibrahim S, Patil V, Smriti K, Shetty S, Rai BP, Chhota P and Somani BK (2022) Legal and Ethical Consideration In Artificial Intelligence In Healthcare: Who Takes Responsibility? Front. Surg. 9:862322.

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Pharmacy Implications

- Which medication- or therapy-related tasks are appropriate for AI to address?
- How should AI models be evaluated?
- For each type of use case, which AI learning approach(es) is(are) most appropriate?

Schutz N, Olson CA, McLaughlin AJ, et al. ASHP Statement on the Use of Artificial Intelligence in Pharmacy. Am J Health Syst Pharm. 2020;77(23):2019-2016. NPITA National Pharmacy Technician Association

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05 WHAT WILL THE FUTURE BRING?

- AI will be an inevitable tool integrated into the healthcare space.
- Implications will be:
 - Changes in the role of the pharmacist
 - Impact on the pharmacy technician profession
 - Opportunities for growth and advancement



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- New training will be necessary for:
 - Pharmacists
 - Pharmacy technicians
 - Students
- Material to address:
 - Data Analytics
 - Capabilities for AI
 - Training on systems
 - Troubleshooting technology
- Protocol development for downtime

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Pharmacy Services Changes

- Medication management services will be augmented with AI
- Pharmacy operations will be automated where applicable and cost-effective with AI
- Expectation of staff to understand capabilities of AI-enabled tools
- Liability will still be in staff hands to perform quality assurance of AI outputs

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TAKE AWAY POINTS

- AI will not replace pharmacy staff, but it will replace staff who do not adapt to AI
- AI will be relied upon to augment the workforce in the coming years
- Training and education of current and future staff will be key to allow AI to function correctly in the pharmacy
- Expect more direction from pharmacy regulators on guidance to use AI in practice

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Questions?

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