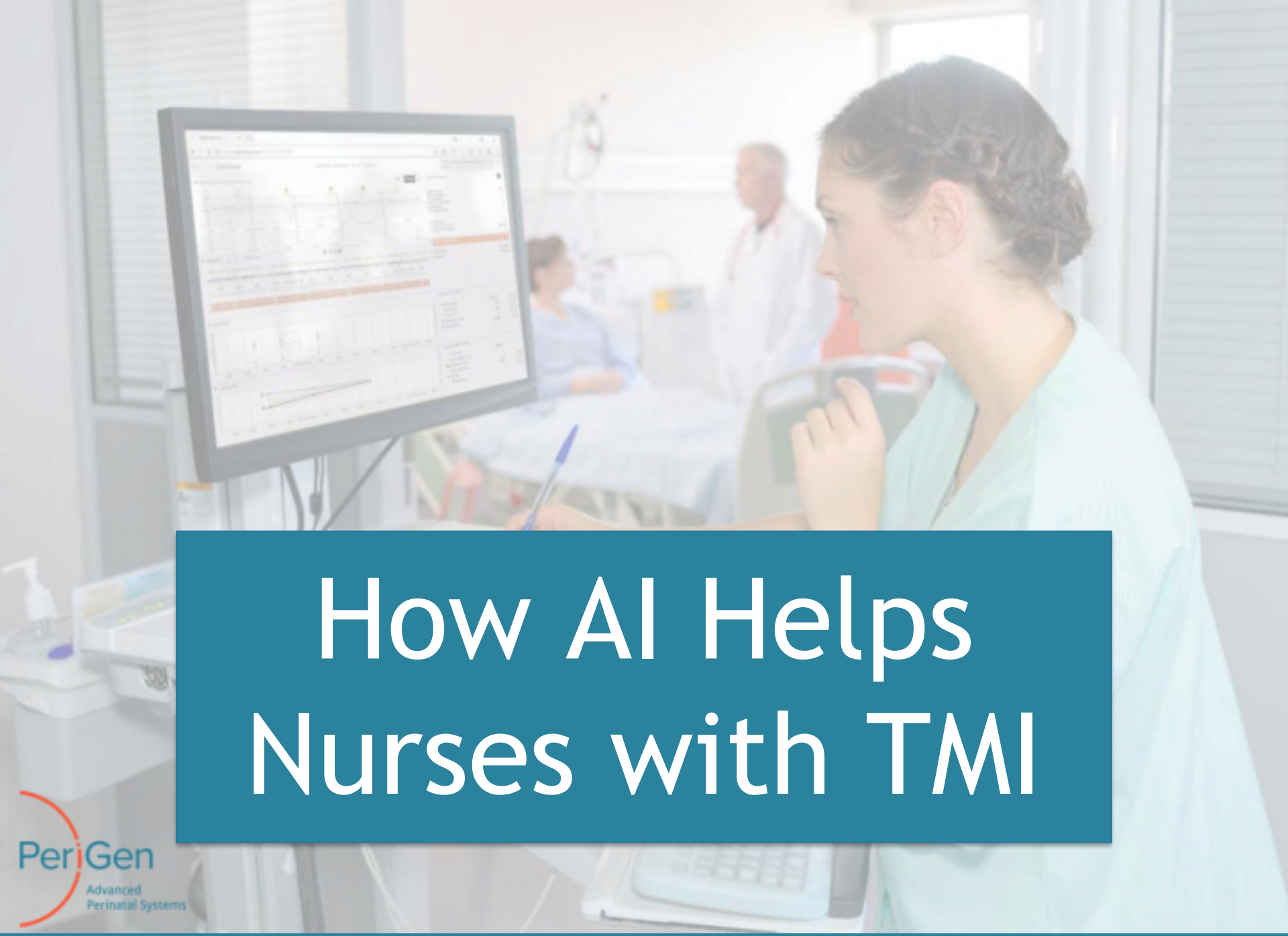
PeriGen

Advanced
Perinatal Systems

Perinatal Systems Built on Artificial Intelligence



How AI Helps Nurses with TMI

PeriGen
Advanced Perinatal Systems

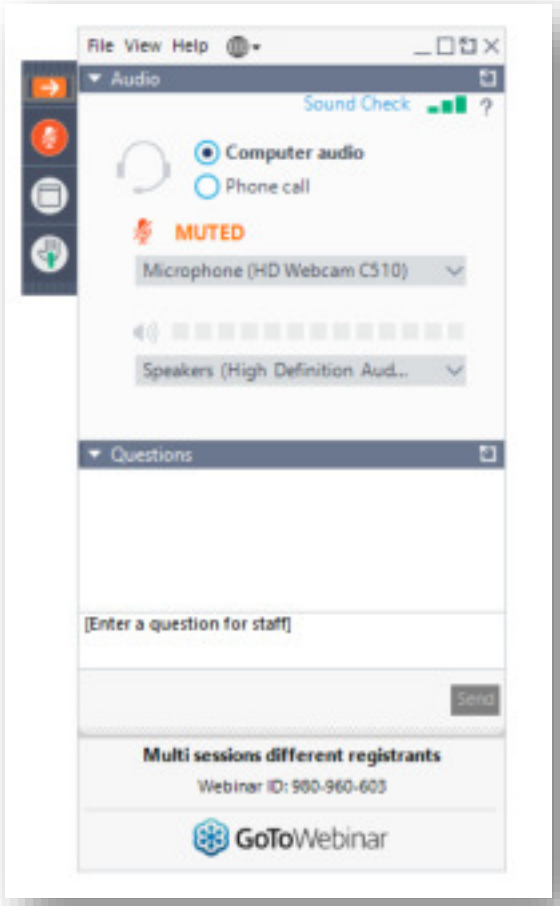
About PeriGen

- Comprehensive labor and delivery patient safety platform incorporating PeriGen's NICHD-validated artificial intelligence – powered clinical decision support tools
- Leveraging evidence-based medicine with 50 peer-reviewed publications: American Journal of Obstetrics and Gynecology, Becker's, Journal of Healthcare Information Management
- PeriWatch Vigilance® is an early warning system that works with an existing EFM to quickly & consistently identify patients who may be developing a potentially worsening condition
- 330 clients nationally

PeriGen
Advanced Perinatal Systems

AIM

Questions



- A recording will be available following the webinar
- To ask a question during the webinar, enter your question into the chat box located in the GoToWebinar panel on the right side of the screen

PeriGen
Advanced Perinatal Systems

Disclaimer

This presentation includes information from PeriGen and other sources (designated on the slides).

PeriGen
Advanced Perinatal Systems

Our Presenter

Dr. Emily Hamilton MD CM
Senior VP Clinical Research

An experienced obstetrician in active clinical practice for more than 20 years, she has held various academic positions at McGill University. She leads the clinical research team at PeriGen.

PeriGen
Advanced Perinatal Systems

Our Presenter

Dr. Alana McGolrick
DNP, RNC-OB, C-EFM
Chief Nursing Officer

PeriGen Chief Nursing Officer

With significant perinatal experience, Dr. McGolrick leads PeriGen's efforts to expand and enhance clinical training, customer outcomes reporting and publishing.

PeriGen
Advanced Perinatal Systems

Our Presenter

Darcy Dinneny

RN, MSN, MBA

Clinical Engagement Specialist

After providing care in L&D for nearly 20 years, Darcy made the leap into healthcare IT. Since that time, she has taught Cerner to RNs, built Epic Stork, and supported PeriCALM prior to joining the PeriGen family.

PeriGen
Advanced Perinatal Systems

Agenda

- Introduction
- Objectives
- Man versus Machine
- Artificial Intelligence
- Clinical Decision Support Tools
- PeriWatch Vigilance® Demonstration
- Summary

PeriGen
Advanced Perinatal Systems

Objectives

1. The participant will demonstrate knowledge and understanding of machine learning algorithms.

2. The participant will be able to verbalize the goal of healthcare artificial intelligence.

3. The participant will be able to identify the application of artificial intelligence to aspects of daily life.

4. The participant will be able to verbalize the five rights of clinical decision support tools.

PeriGen
Advanced Perinatal Systems

Define Intelligence

The ability to think, reason, and understand instead of doing things automatically or by instinct

Collins English Dictionary

PeriGen
Advanced Perinatal Systems

What is Human Intelligence ?

- Use language
- Learn
- Reason
- Understand
- Create
- Plan
- Problem solve
- Separate truth from fiction
- Be self-aware
- Have emotional knowledge

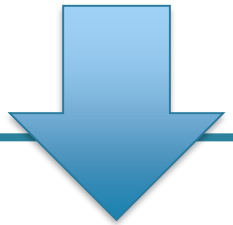
PeriGen
Advanced Perinatal Systems

What is Artificial Intelligence?

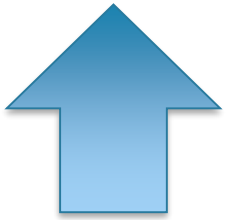
- Refers to collection of mathematical techniques
- Used to accomplish one or more human cognitive functions

PeriGen
Advanced Perinatal Systems

Man vs Machine

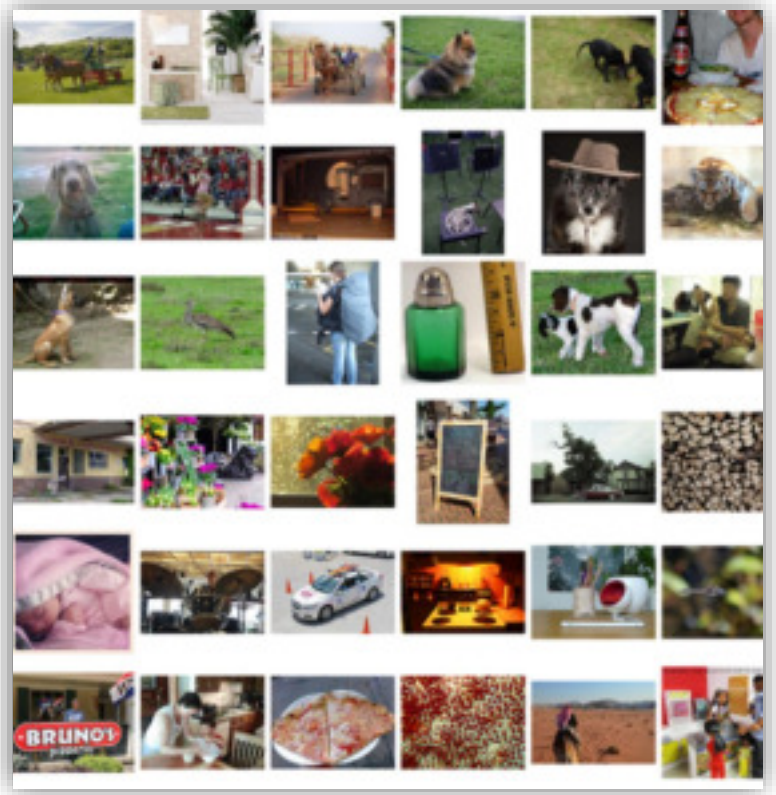


Super-human: better than all	**High-human:** better than most	**Par-human:** similar to most	**Sub-human:** worse than most
Scrabble	Crosswords	Image classification	Face or speech recognition
Chess	Bridge	Handwriting recognition	Translation



PeriGen
Advanced Perinatal Systems

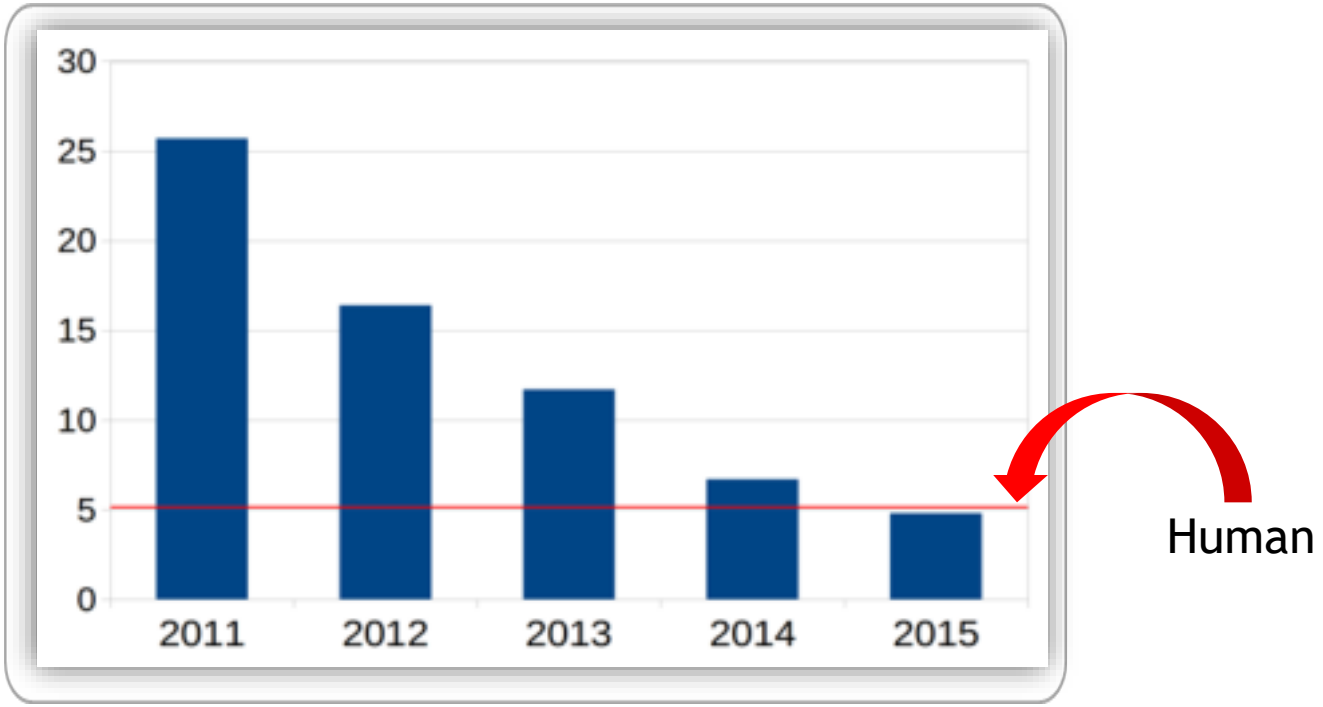
Stanford Imagenet Competition



- Bank of 10 million labelled images
- Identical Training Set to players
- Independent test on 200,000 images

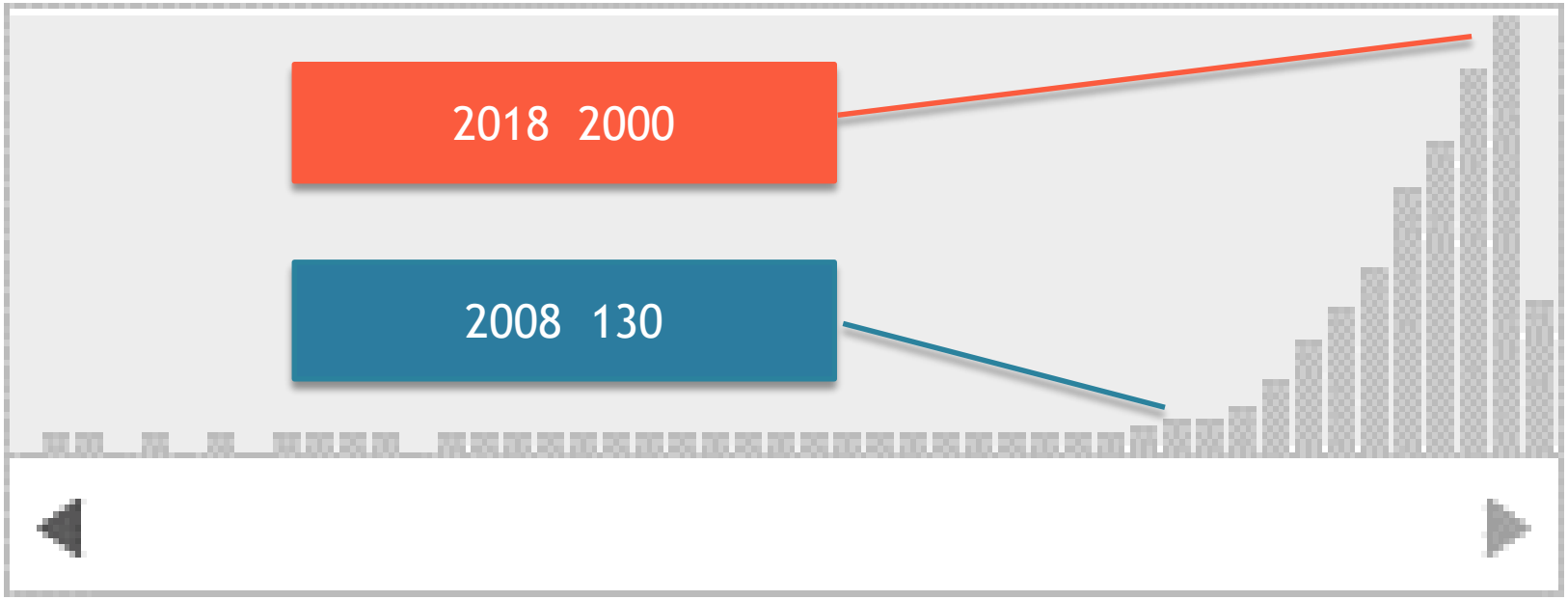
PeriGen
Advanced Perinatal Systems

Decreasing Error Rates of the Winner



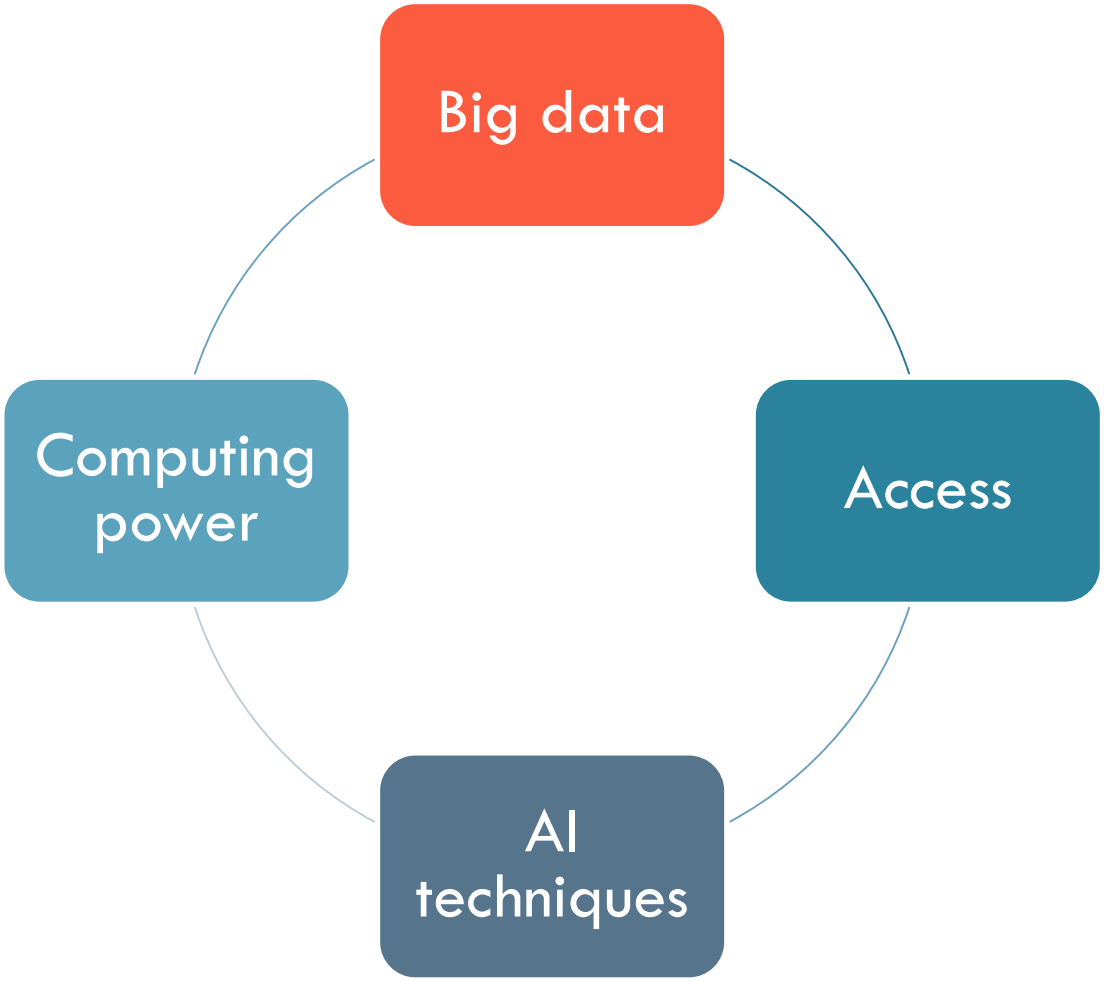
PeriGen
Advanced Perinatal Systems

PUBMED: Machine Learning and Diagnosis



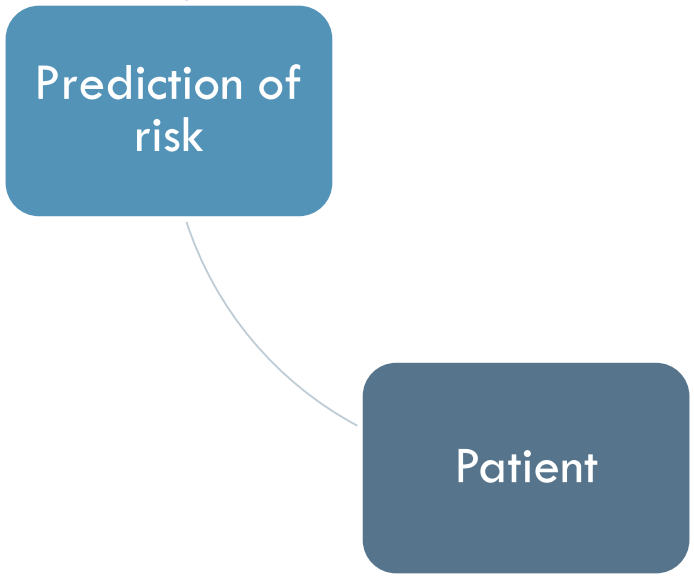
PeriGen
Advanced Perinatal Systems

Why has AI Improved?



PeriGen
Advanced Perinatal Systems

Across all Specialties



Ultrasound, CT, MRI, Mammograms
Diagnose diabetic retinopathy
Diagnose sleep disorders
Skin cancer

Rx based on own genetics

Personalized evidence-based oncology Rx

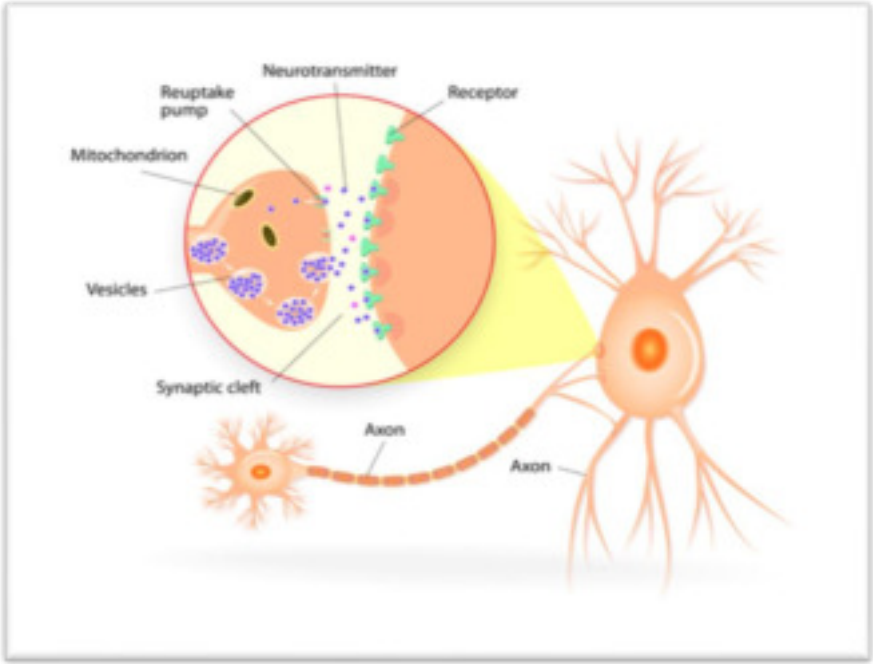
Symptom checkers
Treatment compliance, reminders
Robotic management of supplies, records
Chatbots for assessments

Suicide
Cancer survival
Alzheimer
Autism
ADHD
ICU mortality

PeriGen
Advanced Perinatal Systems

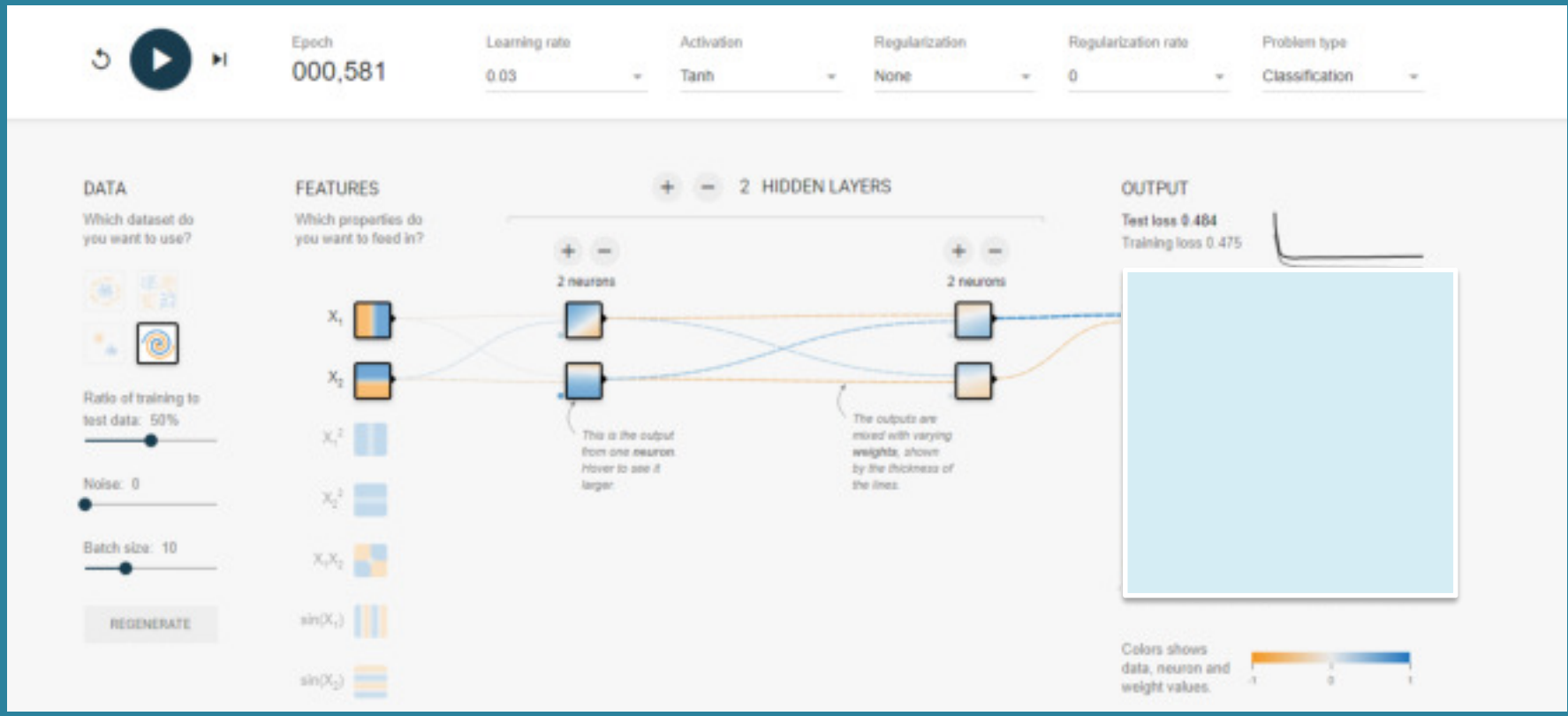
Neural Networks

- Artificial neural networks are mathematical processes
- Resemblance to biological neural pathways in the brain



PeriGen
Advanced Perinatal Systems

https://playground.tensorflow.org



PeriGen
Advanced Perinatal Systems

2 features, 1 hidden layer with 2 neurons

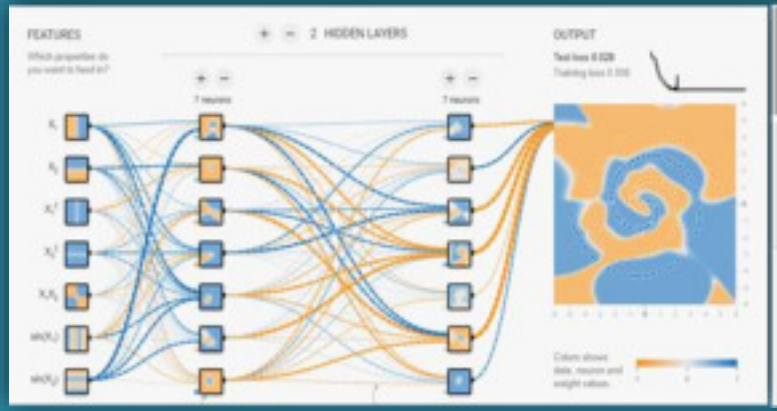
Testing loss 48.1%

Confidence low for most decisions

7 features, 1 hidden layer with 2 neurons

Testing loss 44.9%

Confidence high in small segments



7 features, 2 hidden layers with 7 neurons

Testing loss 2.8%

Confidence high throughout data range

PeriGen
Advanced
Perinatal Systems

To learn more, visit PeriGen.com

Advantages

Looks for most predictive patterns (clusters, combinations)

No predetermined assumptions about what is important

Consistent

Tireless

PeriGen
Advanced Perinatal Systems

Disadvantages

Does precisely what it was trained to do

No more, no less

Dependent on training data

Has a problem with "lies", exceptions, missing data

Not Intelligent, empathic, creative …

PeriGen
Advanced Perinatal Systems

Why is Healthcare an AI-safe profession ?

- Because **medicine is complex**, requires understanding, abstract reasoning and establishing human relationships, communication empathy

- Computers don’t form relationships, are not empathetic and cannot truly understand or reason

PeriGen
Advanced Perinatal Systems

Why is healthcare enhanced by AI ?

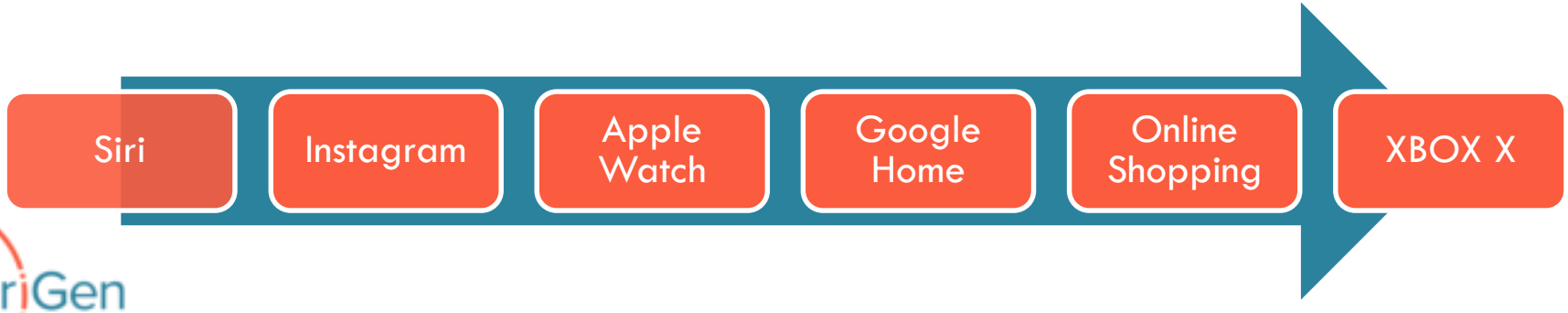
- Because it provides consistent analysis that is objective, data driven
- Reduces TMI and need for repetitive calculations
- Can counter human lapses related to wishful thinking, tunnel vision, boredom, inexperience and fatigue

PeriGen
Advanced Perinatal Systems

Artificial Intelligence and Everyday Life

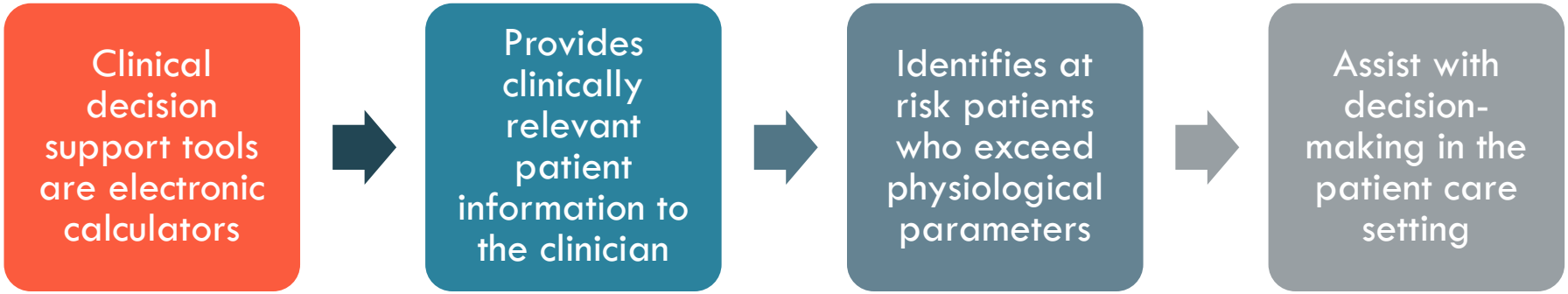
Defined as:

- A branch of computer science that studies simulation of intelligent human behavior
- Computer systems that perform tasks that normally rely on humans to complete
- Include visual perception and mathematical calculations



PeriGen
Advanced Perinatal Systems

Clinical Decision Support Tools



www.healthIT.gov

https://www.himss.org/library/clinical-decision-support/guidebook-series,

The Five Rights of Clinical Decision Support

- The right information
- To the right person
- In the right format
- Through the right channel
- At the right time

http://library.ahima.org/doc?oid=300027#.WcvxR8iGNPY

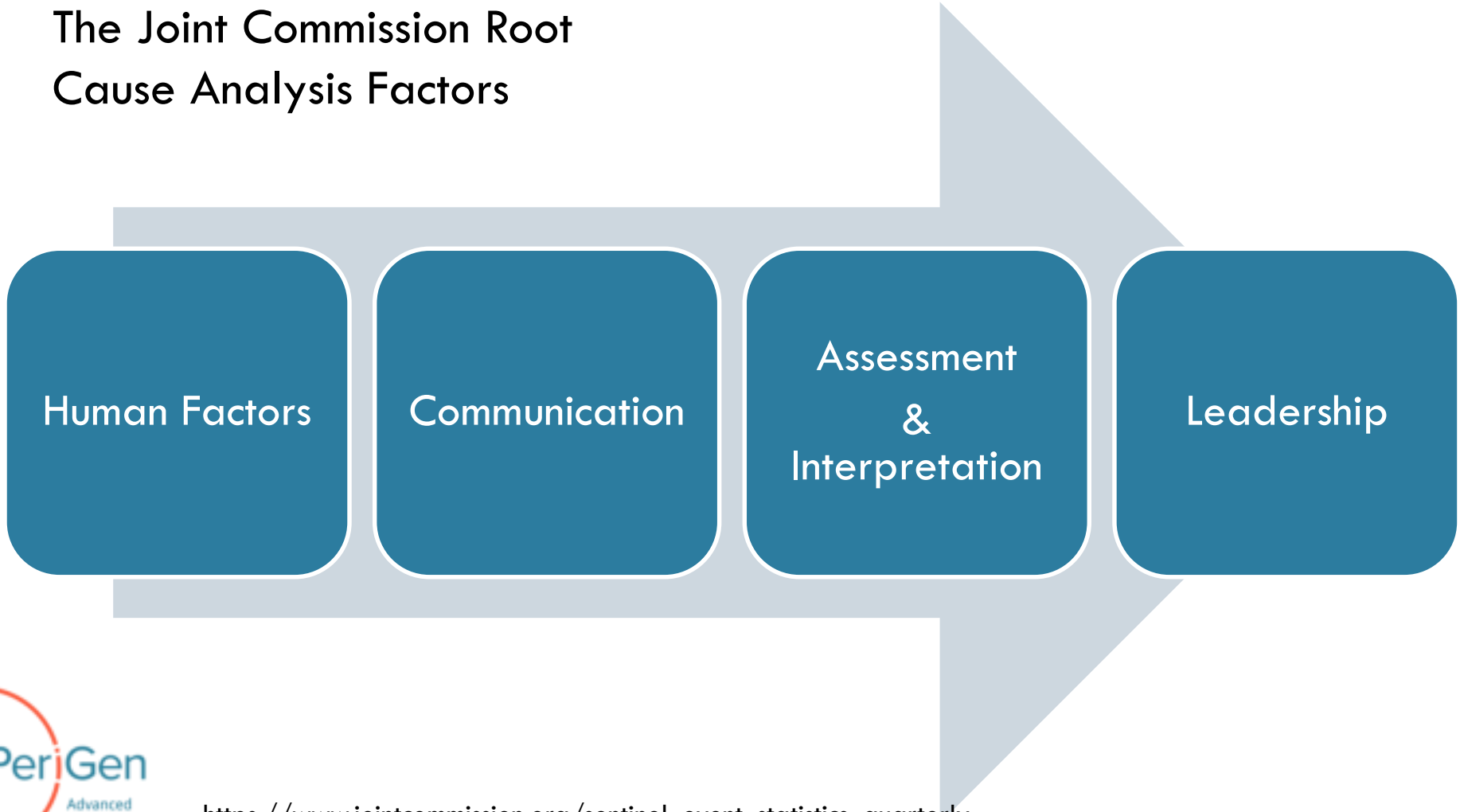
Impact on Perinatal Nursing Practice

- Enhances quality
- Improves inefficiencies
- Objective pattern recognition
- Fosters collaboration
- Early notification
- Communication handoff

(The Office of the National Coordinator of Health Information Technology, 2017, Warrick, Hamilton, & Macieszczak, 2005).

PeriGen Making the Difference

The Joint Commission Root Cause Analysis Factors



https://www.jointcommission.org/sentinel_event_statistics_quarterly

AI '*Made you Look*'

- Provides objective data
- Prioritizes patients based on hospital established thresholds
- Patient values outside of these parameters are considered in a positive state
- Relies on the clinician for appropriate and timely decision-making

PeriGen
Advanced Perinatal Systems

PeriWatch Vigilance® Demonstration

PeriGen
Advanced Perinatal Systems

Summary

- Improve quality of care
- Address patient safety
- Objective vs. subjective data
- Value to healthcare
- Patient satisfaction

PeriGen
Advanced Perinatal Systems

PeriGen

Advanced
Perinatal Systems

Thank You

References

- Alexander, G. L. (2006). Issues of trust and ethics in computerized clinical decision support systems. Nursing Administration Quarterly, 30(1), 21-29.
- Hunt, D. L., Haynes, B., Hanna, S. E., & Smith, K. (1998). Effects of computer-bases clinical decision support systems on physician performance and patient outcomes: A systematic review. Journal of American Medical Association, 280(15), 1339-0000.
- Lee, S. (2013). Features of computerized clinical decision support systems supportive of nursing practice: A literature review. Computers, Informatics, Nursing, (31(10), 477- 495.
- Lytle, K. S., Short, N. M., Richesson, R. L., & Horvath, M. M. (2015). Clinical decision support for nurses: A fall risk and prevention example. Computers, Informatics, Nursing, 33(12), 530-537.
- Mastrian, K., & McGonigle, D. (2017). Patient engagement and connected health. In McGonigle, D. & Mastrian, K. (2017). Nursing informatics and the foundation of knowledge (4th ed., pp. 237-262). Burlington, MA: Jones& Bartlett.
- Staub-Muller, M., de Graaf-Waar, H., & Paans, W. (2016). An internationally consented standard for nursing process-clinical decision support systems in electronic health records. Computers, Informatics, Nursing, 34(11), 493-502.
- The Office of the National Coordinator of Health Information Technology https://www.healthit.gov/
- Warrick, P., Hamilton, E., & Macieszczak, M. (2005). Neural network based detection of fetal heart rate patterns. In Neural Networks, 2005. Proceeding. 2005 IEEE International Joint Conference, 4, 2400-2405.
- Weber, S. (2007). A qualitative analysis of how advanced practice nurses use clinical decision support systems. Journal of American Academy of Nurse Practitioners, 19(12), 652-667. doi:10.1111/j.1745-7599.2007.00266.x

PeriGen
Advanced Perinatal Systems