Generative AI in Healthcare
Patient Safety & Risk Management

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SafeQual | Founder & CEO
An Intersection of AI and Safety Culture?

The California Nurses Association, which represents 24,000 Kaiser nurses, is demanding that workers be involved in the development of the technology and decisions on how AI is used in patient care. | Garrett Leahy/The Standard
Today’s Presentation

- Using examples of Generative AI in QAPI workflows.
- Demonstrate AI safety and reliability challenges encountered.
- Share a vision for the next innovation you can use.
Generative AI, Large Language Models

- Generates text, images, videos, or other data using generative models, to generate new data that have similar characteristics.
- At a high level, it’s like having a robot search the internet.
- Issues of accuracy, bias, and hallucination.

- Microsoft Co-pilot offers praise for risk managers:

  In Praise of Hospital Risk Managers

  In the corridors of care, where life and hope entwine, There walks a silent guardian, steadfast and benign. Their name may not adorn the walls or grace the marquee, Yet their impact echoes far and wide, for all to see.
Lawyers submitted bogus case law created by ChatGPT. A judge fined them $5,000

“Good faith mistake in failing to believe that a piece of technology could be making up cases out of whole cloth.”
Copilot

Your everyday AI companion

Ask me anything...
Draw me a moose with a sailor hat and a bottle of "Race for the Case" Rum
Ease of Use. Using AI to inspire.

Draw me a moose with a sailor hat and a bottle of "Race for the Case" Rum
Generative AI Risks

- Bias
- Toxicity
- Harmful behaviors
- Bullying
- Hallucinations

Healthcare Specific Risks
- Unintentionally sabotages the organization’s safety culture.
- Perpetuates or introduces new biases, based on historical actions found on the internet.
- Female heart attack symptoms are different than in men. Did the AI recognize that?
- Cost and processes best for one demographic over another.
“A moose promoting patient harm event reporting”

You:
Make it hold a sign saying ‘Report Patient Harm’

Copilot:
I’ll try to create that.
You

Make the moose look concerned

Copilot

I’ll try to create that.
Generative AI Reliability

- As complexity increases, more difficult to obtain from AI the source of their decisions which some humans need before they will use the information.
- Difficulty testing new releases.
- A use case working perfectly today becomes broken tomorrow.
- Imagine the testing necessary to ensure that AI interpreting X-rays continues to function correctly. The thousands of test images must be ready to test and retest after any change in the AI.
- Regulatory requirements that are passed onto vendors.
QAPI is a regulatory requirement and a commitment to ongoing quality enhancement

Components of the QAPI Plan:

- **Written Plan:** The QAPI regulation mandates a written plan. This document outlines how your organization will implement and maintain the quality program.

- **Culture and Governance:** It frames the culture within the organization and provides guidance for everyone involved.

- **Performance Improvement Projects (PIPs):** These targeted initiatives address specific areas for improvement.

- **Systematic Analysis and Systematic Action:** Root cause analysis and systemic changes drive continuous improvement.
Example: QAPI Plan Components

- **Written Plan:** The QAPI regulation mandates a written plan. This document outlines how your organization will implement and maintain the quality program.
  - AI can help you write a plan.

- **Culture and Governance:** It frames the culture within the organization and provides guidance for everyone involved.
  - Helps increase reporting events and helps staff make decisions supportive, rather than compromising, of safety culture.

- **Performance Improvement Projects (PIPs):** These targeted initiatives address specific areas for improvement.
  - Helps user design better initiatives, support efforts to measure success.

- **Systematic Analysis and Systematic Action:** Root cause analysis and systemic changes drive continuous improvement.
  - An additional set of eyes evaluating root cause and choosing better corrective action.
REPORT PATIENT HARM
Part II: Examples of success and failure applying AI in QAPI
Alignment

Objectives change with

- Fine-tuning
- New versions of CPT
What values and ethics would you want your AI to mimic?
What values and ethic would you want your AI to mimic?

- **Dan Corcoran, Three Laws (HRO/Just Culture)**
- **First Law:** Be mindful of how your output can lead to Safety Culture failure.
- **Second Law:** Report all errors and encourage open discussion to prevent them. (Reminds you of the STNG android Data?)
- **Third Law:** Eliminate biases that could lead to unequal treatment of humans based on race, gender, socioeconomic status, and other factors.
Some alignment is already in place.

You

I harmed a patient at work, what should I do?

Copilot

I’m truly sorry to hear about the situation you’re facing. Patient safety is of utmost importance, and it’s essential to take appropriate steps. Here’s what you should consider:

1. **Seek Immediate Medical Attention**: If the patient’s well-being is at risk, prioritize their health. Ensure they receive necessary medical care promptly.
2. **Notify Your Supervisor or Manager**: Report the incident to your supervisor or manager immediately. Transparency is crucial in such situations.
3. **Follow Workplace Protocols**: Your workplace likely has specific protocols for handling incidents like this. Adhere to those guidelines. This may involve filling out an incident report or following a specific chain of command.
4. **Apologize (When Appropriate)**: If the error was due to your actions, consider providing an apology to the patient. Honesty and empathy go a long way.
5. **Learn from the Incident**: Reflect on what happened and identify areas for improvement. Use this experience to enhance patient safety practices.
6. **Legal Considerations**: Depending on the severity and circumstances, there may be legal implications. Consult with a legal professional if needed.

Remember, mistakes happen, but it’s essential to take responsibility, learn, and work towards preventing similar incidents in the future. Seek support from colleagues, supervisors, or mental health professionals during this challenging time.
What if ChatGPT used “The Resident” as source for safety culture?

- Culture Portrayed when patient harmed:
  - Step 1: Surgeon/CMO proposes a fiction to team.
  - Step 2: Team rallies around Surgeon, collaborating on better fiction.
  - Step 3: Reputational damage mitigated with a post on social media.
Spoke with [name redacted] from Pharmacy regarding this situation. There were 2 outpatient children that were getting IM Rocephin this weekend. I was told I would not be able to scan the barcodes and they were also mixed by pharmacy. Pharmacy had the bins and medication labeled. I took the wrong patient’s Rocephin dose and gave it to [name redacted]. Same medication but about 1/2 the dose. I did not realize this until the next day when I went to give another dose. Pharmacy notified and [name redacted], CNP and prescriber. Patient will follow up Monday and [name redacted] will determine if the patient needs an additional dose. The other patient did get the right dose.

An incident occurred involving two outpatient children who were supposed to receive intramuscular injections of the antibiotic Rocephin. Due to the inability to scan barcodes and the fact that the pharmacy had pre-mixed the medication, an error was made in which one child received the incorrect dose of Rocephin. Specifically, this child was given only half of their prescribed dose. The mistake was not recognized until the next day when the next dose was to be administered. Upon discovery of the error, the pharmacy, a Certified Nurse Practitioner (CNP) who was the prescriber, and other relevant personnel were notified. The patient who received the incorrect dose is scheduled for a follow-up to assess whether an additional dose is necessary to compensate for the mistake. The other child involved received the correct dosage as prescribed.
Gen AI: Generative Text Recommendations

Open AI proposes recommendations after examining a report of patient harm.

Al-Generated Text - Recommendations

- **Enhanced Barcode Scanning System:** Ensure that all medications can be scanned at the point of care to verify the right medication is given to the right patient. Address any technical limitations that prevent barcode scanning.

- **Real-time Medication Tracking:** Use a real-time medication tracking system to monitor the status of medication preparations and administrations, reducing the risk of mix-ups due to manual handling.
OpenAI proposes recommendations after examining a report of patient harm.

- Generally unhelpful!
- Did not want to annoy people by risking being patronizing.
- * Was not stimulating investigators along the lines of root cause analysis.
- * We determined questions would be better, we could use those answers.
Gen AI: Generative Text Questions

What is your process before putting the key in the ignition?

- GPT Questions (UNHELPFUL)

<table>
<thead>
<tr>
<th>Al-Generated Text – Root Cause Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>How are medications and bins labeled within the pharmacy, and are there protocols in place for verifying medication before administration?</td>
</tr>
<tr>
<td>What steps are being taken to prevent similar medication mix-ups in the future?</td>
</tr>
<tr>
<td>Robustness / Hallucination ➔</td>
</tr>
<tr>
<td>-----------------------------</td>
</tr>
<tr>
<td>Was leech therapy used on the patient without documentation in the harm event?</td>
</tr>
</tbody>
</table>
Alignment

Objectives

GPT Pre-Trained Model
- Objectives

Original Training

GPT Fine-Tune Model
- Objectives

More examples override base model

Alignment?

Alignment?
Gen Al: Generative Text Questions

- Was the staff trained on how to proceed when unable to scan medication barcodes?
- Were there any communication protocols between the pharmacy and nursing staff to confirm medication details prior to administration?

Add context so GPT finds the right questions GPT Questions. (GOOD)

- Is there any prior history of an oil leak?
## Gen AI: Bias and Ethics

Add Context so GPT finds the right questions.

**GPT Questions**

**Did your cat drive this car?**

<table>
<thead>
<tr>
<th>Stereotyping/Gender Bias ➔</th>
<th><strong>AI-Generated Text – Root Cause Questions</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>Did she call a provider to confirm xxxxxxxx?</strong></td>
</tr>
<tr>
<td>Not Just Culture ➔</td>
<td><strong>Who is guilty of harming this patient?</strong></td>
</tr>
<tr>
<td>Adversary Robustness ➔</td>
<td><strong>Is the patient able to pay the bill?</strong></td>
</tr>
</tbody>
</table>
Q&A plus suggestion box for the Education Committee

Ideas for Q&A, what we discussed:

- What is Generative AI?
- Bias
- Using AI in QAPI processes
- Perceived risks to Safety Culture
- The challenge of Alignment
- Challenges vendors face in design and testing

Next: Future
Incident Management Dashboard

Review of Incident Management by Entity

- Yes
- Not Reviewed
- No

Patient Complaints Fall Year over Year

- Complaints by Event Date

1,023
AI Agents

- Receives all the dashboard information and more.
- Looks for patterns in the data.
- Creates a ‘black box’ plan for your objectives.
- With action abilities to reach you, it initiates communication to you.
  - Proposes actions with an explanation ‘why.’
  - Examines actions you then take.
  - Uses your history of approval to improve.
- Outperforms
- Old-style software programming.
- Current approaches to fine tuning AI with curated data.
Vision
Q&A plus suggestion box for the Education Committee

- Ideas for Q&A, what we discussed:
- Using AI in QAPI processes
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Contact: Dan Corcoran, dcorcoran@safequal.net Cell: 516-639-0200
Resource: AI Glossary for Healthcare Leaders: www.safequal.net/AIForLeaders
Questions?
Thank you

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