Use of Systems-Theoretic Process Analysis to Design Safer Opioid Prescribing Processes

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Introduction

Background: The opioid epidemic continues to impact nearly all populations across the United States, underscoring the need for safe opioid prescribing processes. Systems engineering methods can help evaluate and design safer opioid prescribing.

Purpose: To illustrate and evaluate the utility of the Systems-Theoretic Process Analysis (STPA) method for evaluating and designing safer opioid prescribing practices.

STPA Approach

1. System Description
2. Accidents/Unacceptable Losses
3. Hazards
4. Control Structure
5. Unsafe Control Actions
6. Safety Requirements
7. Suggested Controls

System Description: The primary care center is an academic practice with roughly 17,500 patients. Approximately 140-180 patients in this practice have recurring opioid prescriptions at any given time, with the majority receiving prescriptions for chronic non-cancer pain.

Results

Accidents
1. Patient becomes dependent on opioids
2. Healthcare provider fails to identify patients with opioid dependence or substance abuse
3. Patient experiences opioid overdose
4. Patient obtains multiple prescriptions from multiple prescribers
5. Patient misuse and diversion
6. Patient abuses opioids (use illegal substances while on opioids)
7. Patient stops opioid treatment too soon, without weaning or without alternative to opioid medications

Related Hazards

Opioid induced patient mortality or morbidity

Patient's inability or difficulty to obtain a required prescription

Impact of Results

- Original RPMS
- Updated RPMS

Tool Assessment

- Average rating by healthcare professional
- Average rating by system engineers

Conclusion

- STPA identified several missing needed safety controls in an opioid prescription management process.
- Some recommendations require management support, but others are immediately possible.
- While STPA appears valuable in such processes, healthcare personnel expressed difficulty understanding the method.