

OBJECTIVES

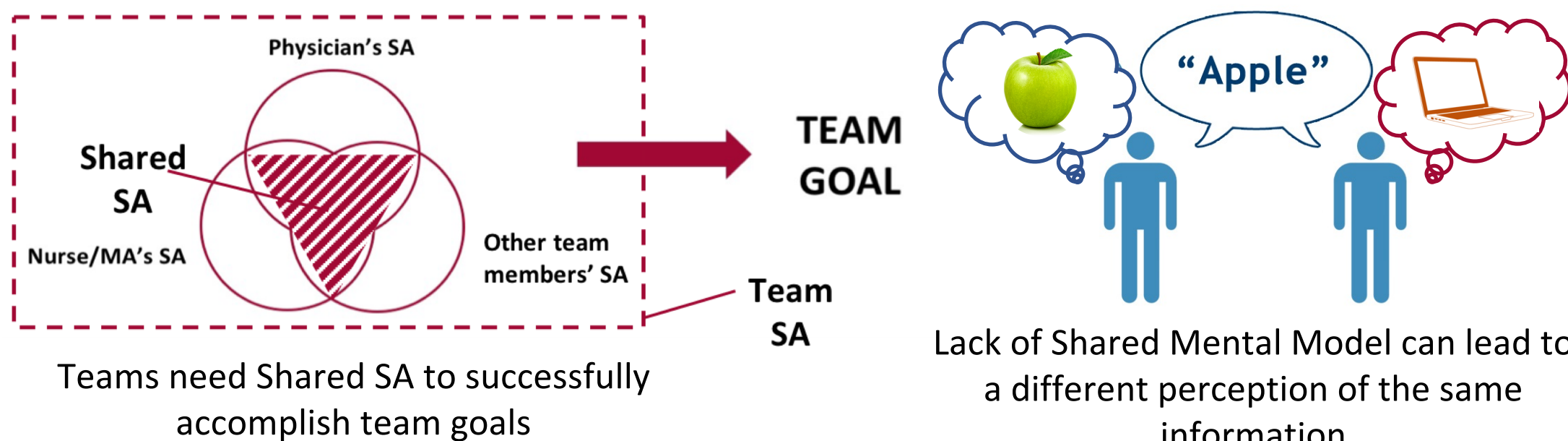
- To understand the physical and cognitive tasks involved in addressing patients' preventive care needs by primary care teams
- To understand the role of cognitive components in this process, especially with Shared Situation Awareness (Shared SA) and Shared Mental Model

BACKGROUND

- Primary care is on the front line for managing preventive care; effective teamwork is crucial for the successful delivery of primary care
- Preventive care needs are usually addressed proactively, requiring additional planning and cognitive effort by primary care teams

Team Cognition

- Team cognition:** 1) a cognitive activity that occurs at a team level; 2) the basis for team coordination and effectiveness; 3) includes two core components: Shared SA and Shared Mental Model
- Situation Awareness (SA)**^[1]: how an operator understands the surrounding environment/system; includes 3 levels:
 - Level 1:** Perception, e.g. "due" alert for an immunization in the electronic health record (EHR)
 - Level 2:** Comprehension, e.g. whether an immunization applies to a patient
 - Level 3:** Projection, e.g. how (not) giving an immunization will impact a patient's health in the near future
- Mental Model:** systematic understanding of how something works - key enablers of Level 2 and Level 3 SA^[2]; has 3 types^[3]:
 - 1) Declarative (facts, rules, and relationships between elements), e.g. flu shots should be given every year
 - 2) Procedural (steps needed to accomplish tasks), e.g. patients' questions should be communicated to physician/APP if I (MA) am not sure about the answer
 - 3) Strategic (basis of problem solving), e.g. preventive care activities are lower priority compared to some acute issues
- Shared SA:** the degree to which team members have the same SA on shared SA requirements^[4]
- Shared Mental Model:** shared knowledge structure among team members that helps in describing, explaining, and predicting events in patient care activities



METHODS

Data Collection

- Setting:** Two Physician/Advanced Practice Professional (APP) teams from a Midwest Internal Medicine clinic
- Participants:** 3 Physicians/APPs, 2 nurses, 3 medical assistants (MA), 2 clerks, and 1 certified diabetes educator
- Participants **observed for 2-4 hours & interviewed on their work goals, decision making and information needs 1-3 times**, each interview lasting up to 90 minutes

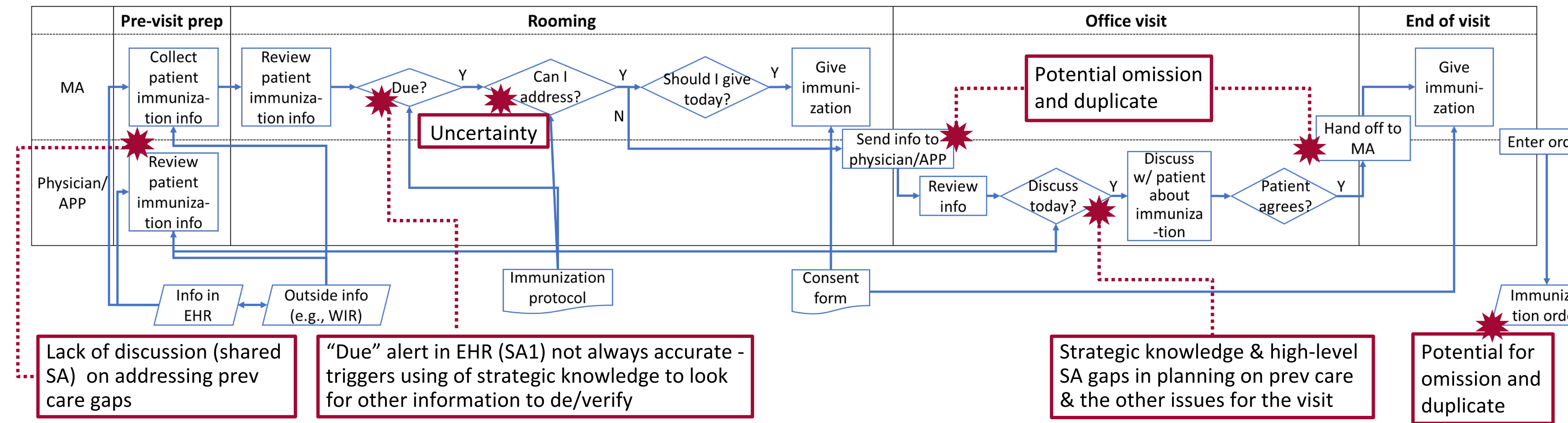
Data Analysis

- Directed content analysis performed for all observation notes and interview transcripts to identify excerpts regarding preventive care activities
- In total, 45 excerpts were reviewed, including 12 from physicians/APPs, 31 from nurses/MAs, and 2 from other clinic team members

- Excerpts were coded with predefined codes, including physical tasks and timing, cognitive tasks, SA elements, mental model elements, and type of preventive care activity
- Coded excerpts were organized by type of preventive care activity
- Flowchart built for workflow in addressing preventive care needs
- SA & mental model elements compared among team members to identify potential teamwork gaps

RESULTS & DISCUSSION

Process map for giving immunizations



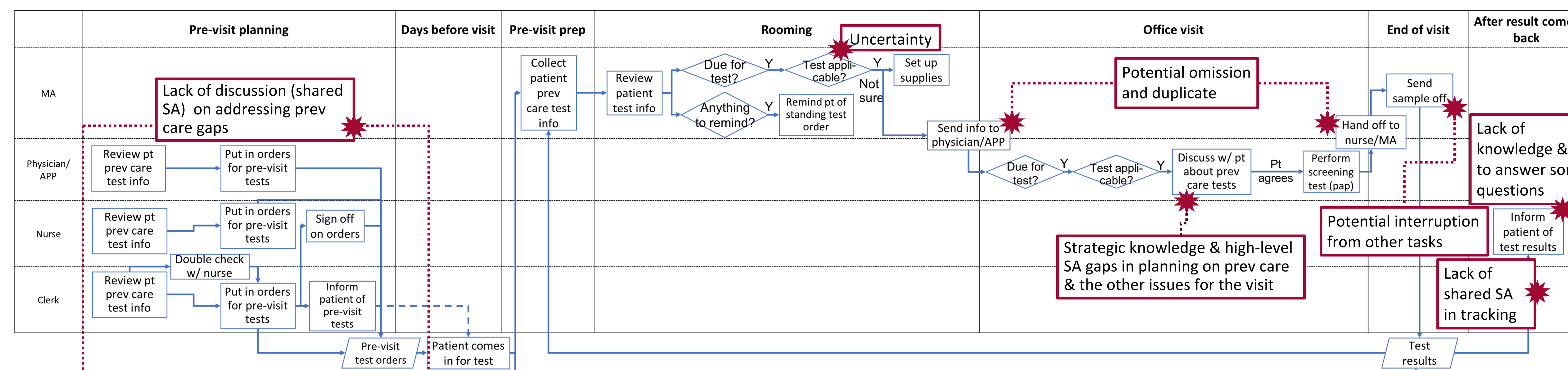
Take-away Messages

- When given an indicator of due/overdue preventive care activities, primary care team members decide on whether they should be addressed by using the 3 levels of SA (perceiving, analyzing and making a decision about each activity)
- Primary care team members' mental model knowledge guides their search for preventive care gaps/standing orders. This involves forethought, searching, pattern matching, and verifying each gap/order.
- Nurses, MAs and unit clerks often rely on their mental model's declarative knowledge and procedural knowledge when making assessments and decisions, while physicians/APPs also utilize strategic knowledge to assess the overall condition of a patient

Discussion

- Viewing data and all of the workflows for different team member's roles offers a panoramic view of the team process and how/where interactions/handoffs occur
- Primary care teams require an EHR design that supports communicating about the status of tasks, including preventive care activities
- Limitation: data used from only 1 clinic

Process map for performing preventive screening tests (e.g. Pap smears, colon cancer tests, mammograms)



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