

# Clinicians' Experiences with EHR Documentation and Attitudes Toward AI-Assisted Documentation

## National Poll and Stanford Poll

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[med.stanford.edu/healthcare-ai](https://med.stanford.edu/healthcare-ai)

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# Background and Objectives



- In September 2019, Stanford Medicine and Google Health conducted a comprehensive study of primary care providers' (PCP) experiences with documentation in the electronic health record (EHR), and their attitudes toward artificial intelligence (AI)-assisted documentation. This study surveyed 50 PCPs at Stanford Medicine.
- In October 2019, Google Health conducted a similar study surveying 204 PCPs across the United States.
- This report is a synthesis of the findings across both studies.
- The goals for this research were to determine the following:
  1. Providers' documentation tasks, workflows, and time commitment
  2. Perspectives on the most cognitively helpful and clerically burdensome aspects of documentation
  3. Preferences for AI-enabled assistance with specific documentation tasks
  4. Perspectives and lessons learned from experiences with human scribe-enabled documentation
- **This report aims to inform the design of the next generation of AI-enabled documentation technologies.**

# Methodology



The Stanford survey was conducted online by Stanford Medicine and Google Health in September 2019 among 50 PCPs at Stanford's primary care clinics.



Participants were recruited via email lists across Stanford's Division of Primary Care and Population Health in the Department of Medicine.



Quotas were not set, and provider roles included medical doctors and nurse practitioners, with an emphasis on family and internal medicine.



Quantitative data were analyzed with descriptive statistics. Qualitative data were analyzed through inductive thematic analyses performed by four researchers collaboratively.



The national survey was conducted online by Google Health in October 2019 among 204 PCPs.



Recruitment occurred through a Qualtrics panel, with quotas set to reflect the demographics of U.S. adult PCPs and include an even split of female and male providers.



Provider roles and quotas were based on Graham Center data on relative proportions of PCP roles, and included medical doctors, nurse practitioners, and physician assistants, with an emphasis on family and internal medicine.



Quantitative data were analyzed with descriptive statistics. Qualitative data were analyzed through inductive thematic analyses performed by three researchers collaboratively.

# Executive Summary

# Key Takeaways

Stanford Medicine and Google Health conducted comprehensive surveys of 254 PCPs on their experiences with EHR documentation and perspectives toward AI-enabled documentation assistance. Some key findings include:



1. Documentation assistance relieves providers from the most time-consuming and clerically burdensome aspects of the visit documentation workflow.



2. AI-assisted documentation can be designed to support cognitive processes by freeing providers from the need to perform less cognitively useful tasks.



3. Providers generally prefer AI-enabled assistance with documentation tasks that they perceive to be primarily clerical, as opposed to tasks that are perceived as cognitive work – exceptions provide unique design opportunities.



4. AI-enabled documentation tools should be inconspicuous and provide high quality, accurate notes in a way that promotes efficiency of practice.



5. Human scribe-enabled documentation assistance can save providers time, improve quality of care, and provide accurate, high quality clinical notes, but unlike AI-enabled documentation, requires ongoing training and orientation.

# Detailed Findings

# I. Documentation Workflow

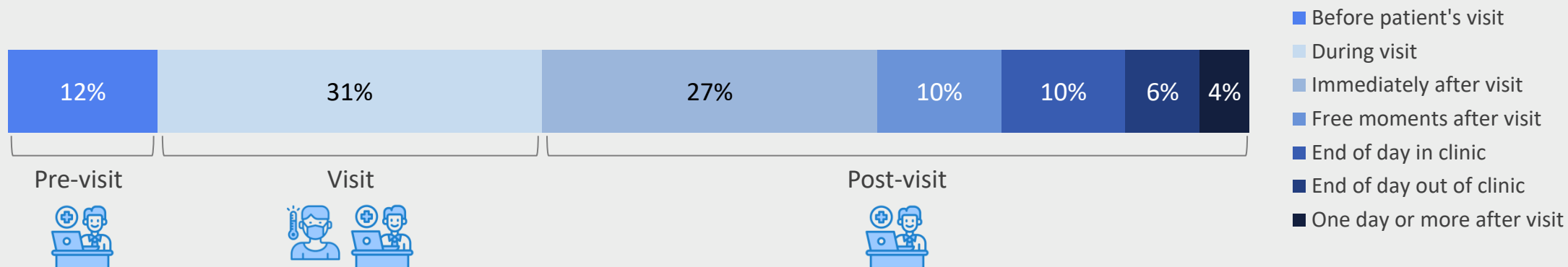
II. Perspectives on Documentation

III. Preferences for AI-Enabled Documentation

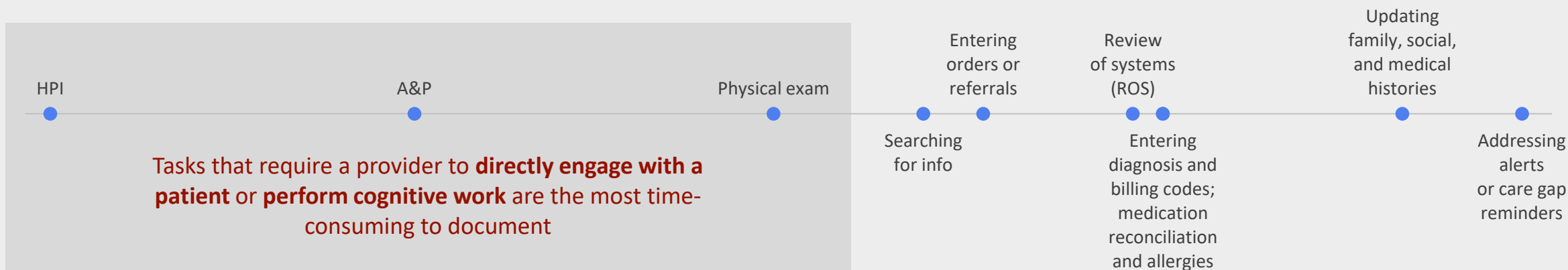
IV. Lessons from Scribe-Enabled Documentation

# Providers complete approximately 60% of total EHR work during or immediately after a patient encounter

Average percentage of **EHR work conducted** during the following time periods



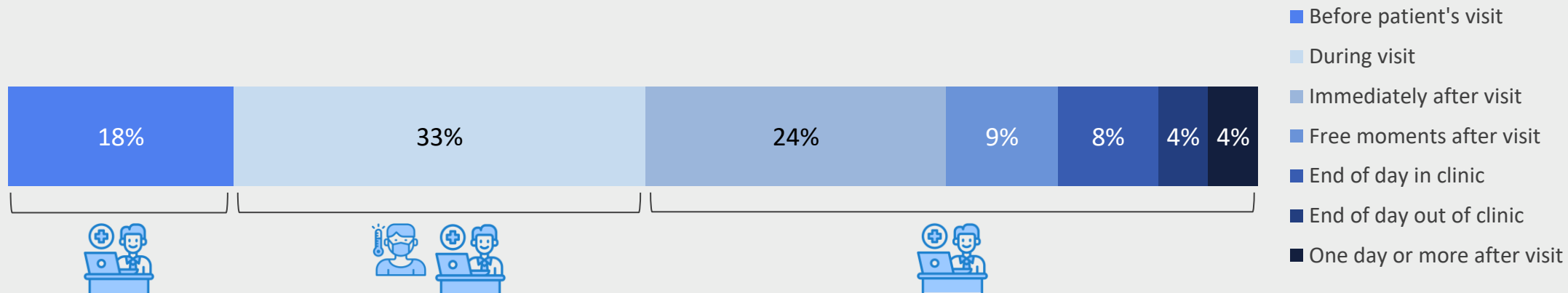
Average **ranking of documentation tasks** in order of most time-consuming to least (left to right)



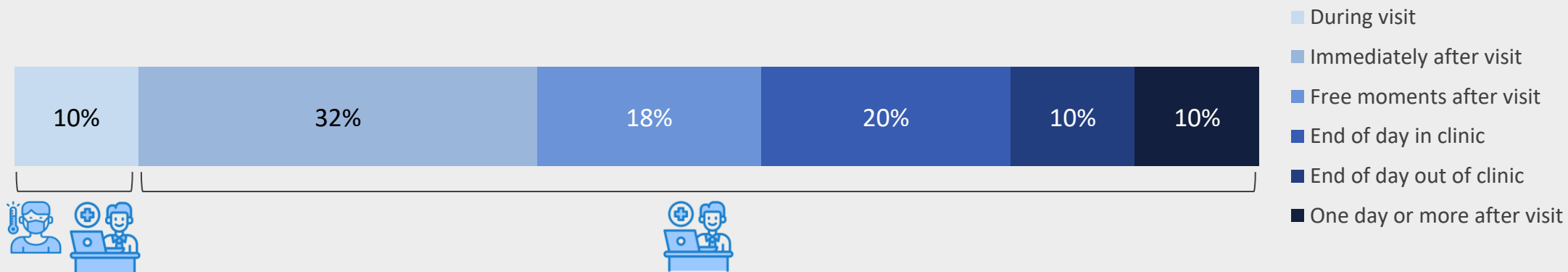


# Providers start and complete 80% of encounter notes before leaving clinic on the day of a patient's visit

Average percentage of **notes opened and started** during the following time periods

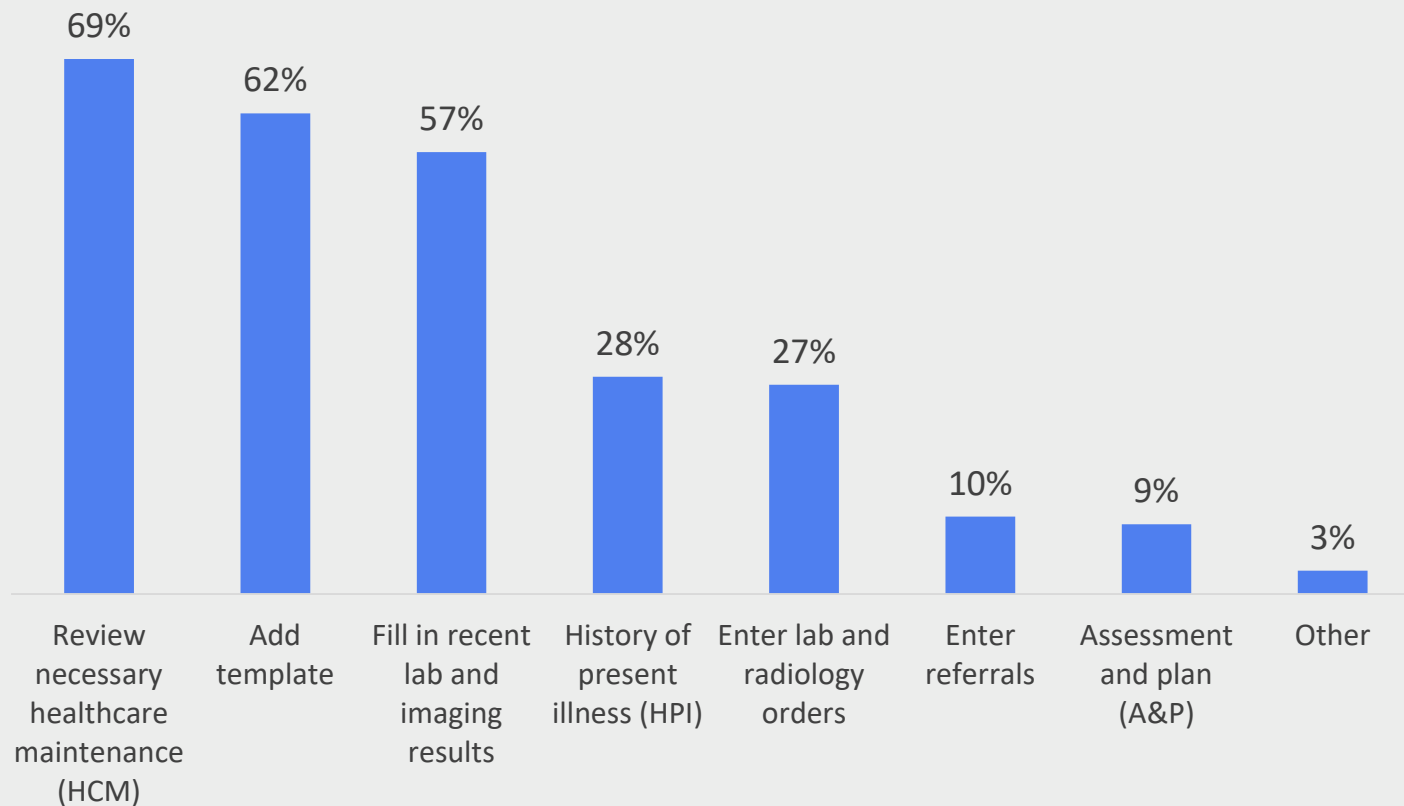


Average percentage of **notes signed** during the following time periods



# Many documentation tasks can be completed before a patient encounter

Documentation tasks that providers complete before a patient visit



Base: National survey respondents who reported opening and starting some % of notes before visits (n = 132); close-ended format

PCPs cite these as the most common types of information generated before visits that are included in the note:



Healthcare maintenance



Labs and test results



Consultation notes



Chief complaint



Medications

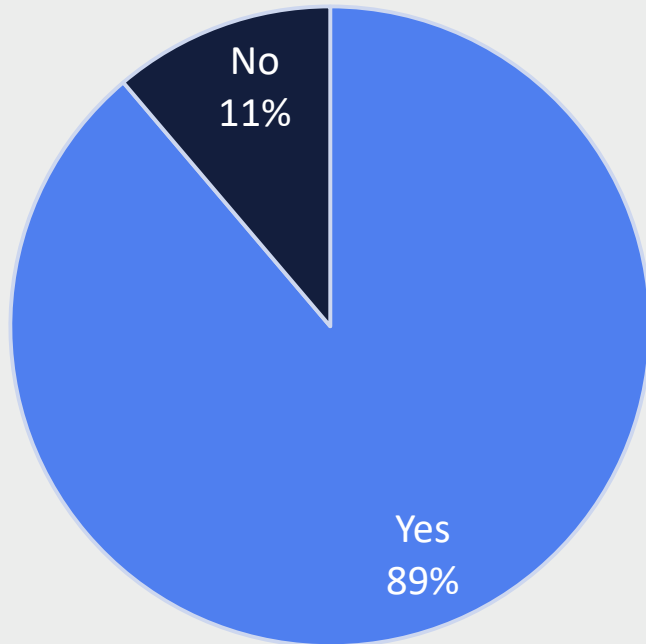


Family, social and past medical histories

Base: All qualified respondents in the Stanford survey (n = 50); open-ended format

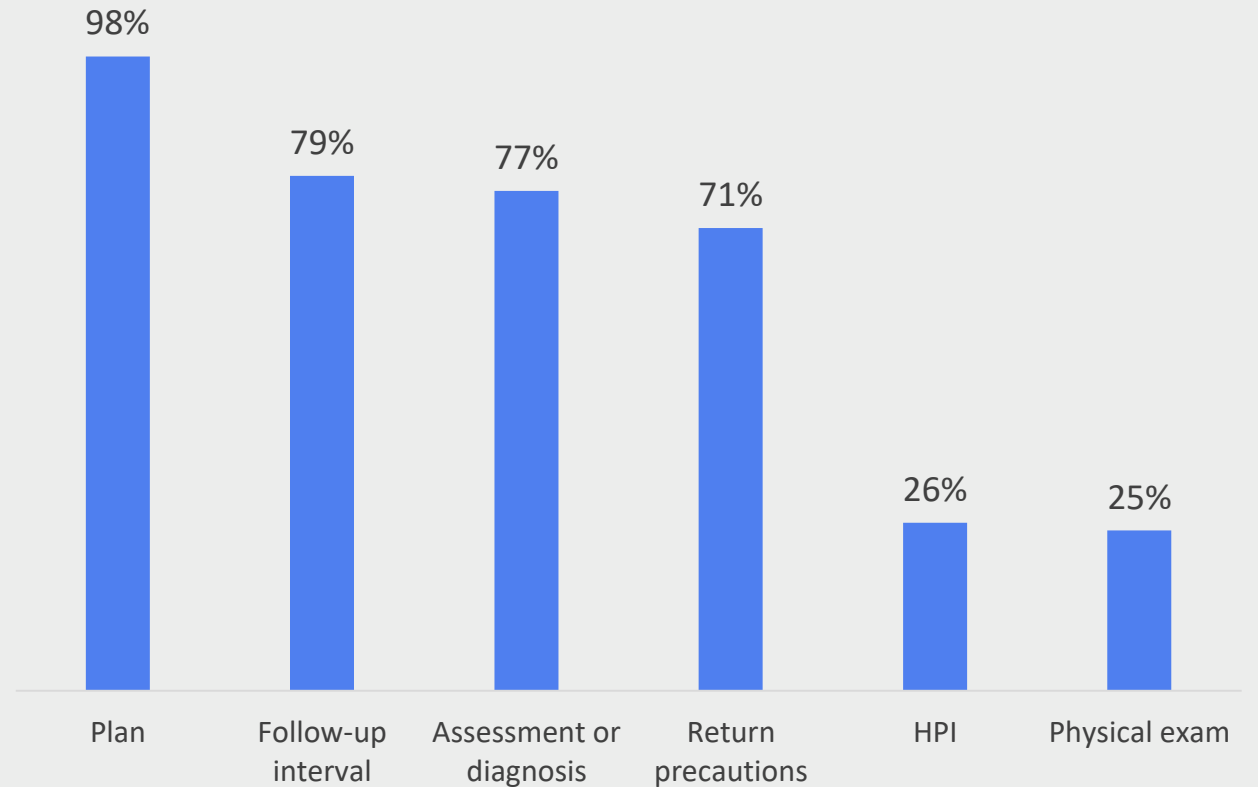
# 9 in 10 providers summarize next steps for patients after a visit, often the conclusions of their cognitive work

89% of PCPs currently summarize information for patients towards the end of an encounter



Base: All qualified respondents in the national survey (n = 196); close-ended format

Information that PCPs summarize or recap for patients



Base: National survey respondents who currently summarize info for patients (n = 174); close-ended format

# Providers experience many challenges in documenting patient encounters

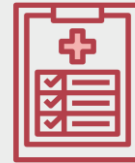
## Overall documentation completeness and accuracy

“I do not want to sign a skeleton note that does not have accurate data, and does not fully capture all the items I discussed with the patient or the latest results”

“Assuring I recall all information exchanged during the visit”

“Ensuring that I’ve documented all pertinent facts for the HPI”

“Correcting spelling or grammar”



## Reasoning and clinical decision-making

“Clinical decision-making: I sometimes need to think about the visit a bit to develop my plan before documenting it”

“Finishing assessment and plan for a patient with multiple (5+) problems”

“If a patient has seen a lot of specialists or is having a lot of other work-up, reviewing specialist notes or records and synthesizing information in my note take a long time”

## Challenges that PCPs experience when finalizing the note for sign-off

### Busy clinic workflow

“Patients arrive late, leaving sometimes only 15 minutes of a 30-minute visit... I cannot do a good job in the visit and also close the encounter – something has to give”

“Having to start and stop and be interrupted by staff with clinical needs, by colleagues who are being friendly, by the next patient that needs to be seen”

“I commonly have paperwork waiting for me which I prioritize over getting my notes done so that these items move forward for patients and my coordinator”



### EHR interaction design

“Waiting to close the note if someone else is in the chart for vaccines, lab draw, etc.”

“So many painful checkboxes for billing, population health, referrals, etc.”

“Finding the ‘\*\*\*’ indicating sections that haven’t been completed”

I. Documentation Workflow

## **II. Perspectives on Documentation**

III. Preferences for AI-Enabled Documentation

IV. Lessons from Scribe-Enabled Documentation

# Providers view many documentation tasks as both cognitively helpful and clerically burdensome

Aspects of documentation that PCPs cite as being **cognitively helpful**



Reviewing and abstracting historical visit notes and data from within medical record

Documenting A&P  
Documenting HPI  
Updating problem list  
Documenting physical exam  
Reconciling medication list  
Updating family, social, and past medical histories  
Generating after visit summaries (AVS)

Interacting with the EHR  
Documenting ROS  
Reviewing and abstracting historical visit notes and data from outside medical record  
Assigning billing codes to visits

Aspects of documentation that PCPs cite as being **clerically burdensome**



# Most clerically burdensome documentation tasks are necessary, but do not require clinician-level expertise or clinical reasoning

Aspects of documentation that PCPs cite as being **cognitively helpful** (Top 4)



Aspects of documentation that PCPs cite as being **clerically burdensome** (Top 4)



1) Documenting A&P

1) Documenting A&P

Providers find documenting A&P **both** highly cognitively helpful **and** clerically burdensome

2) Reviewing and abstracting historical visit notes and data within medical record

2) Reconciling medication list

3) Documenting HPI

3) Documenting HPI

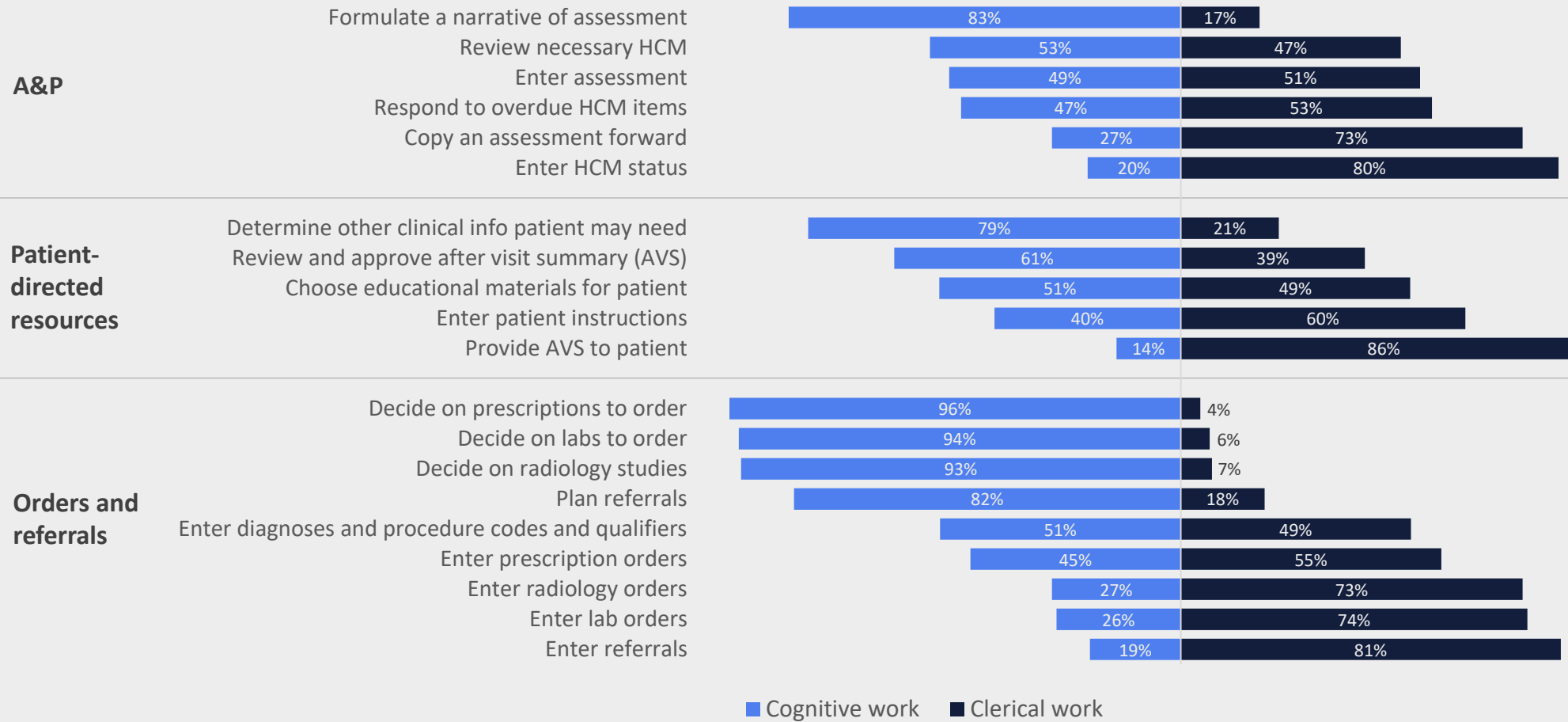
4) Updating problem list

4) Documenting physical exam

# Clinical planning and decision-making are cognitive tasks, whereas data and order entry are primarily clerical tasks



Providers' perceived type of work associated with tasks related to **assessment and plan, patient-directed resources, and orders and referrals**

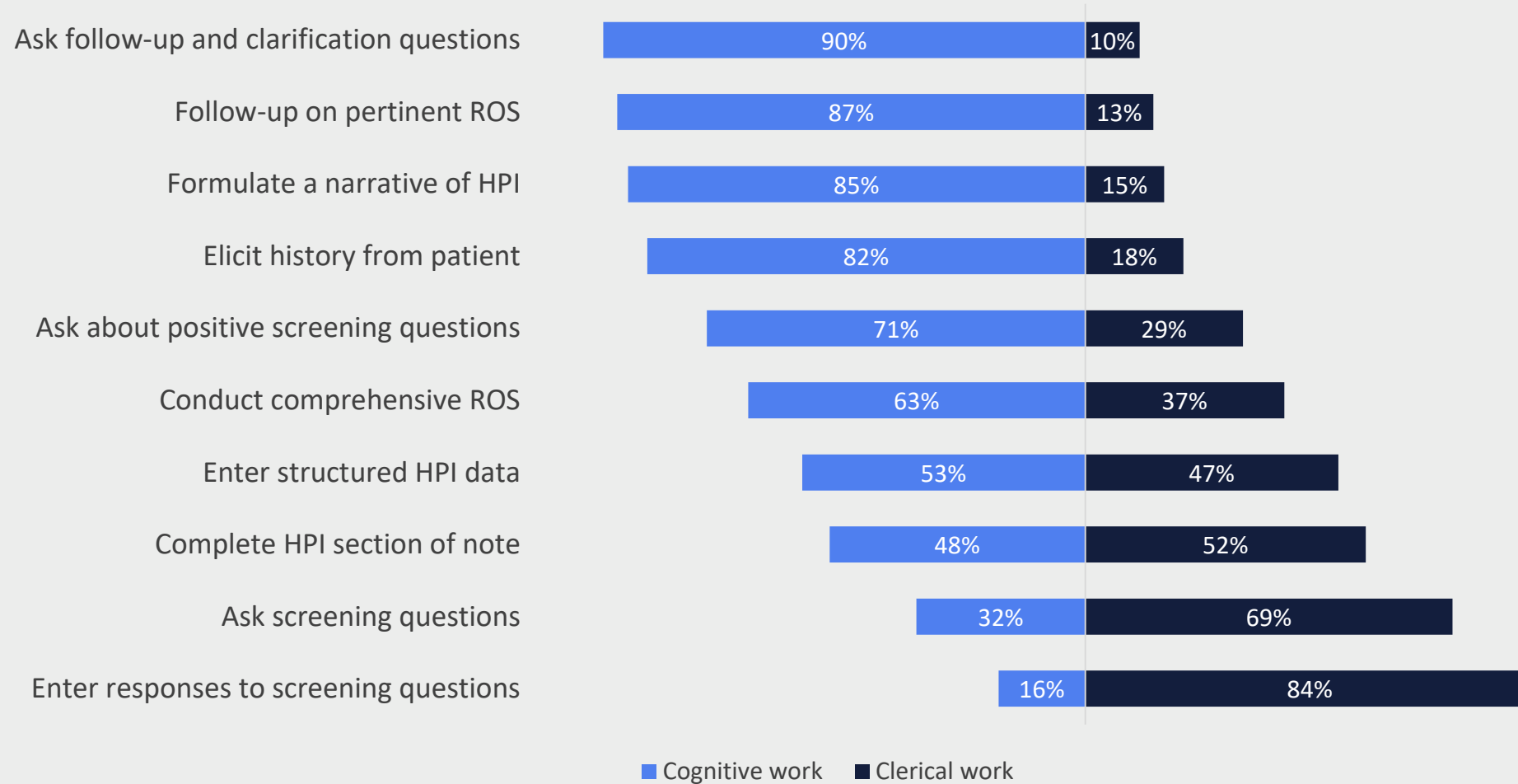


Base: All qualified respondents in the national survey (n = 197); close-ended format



# History-taking requires a mix of cognitive and clerical work

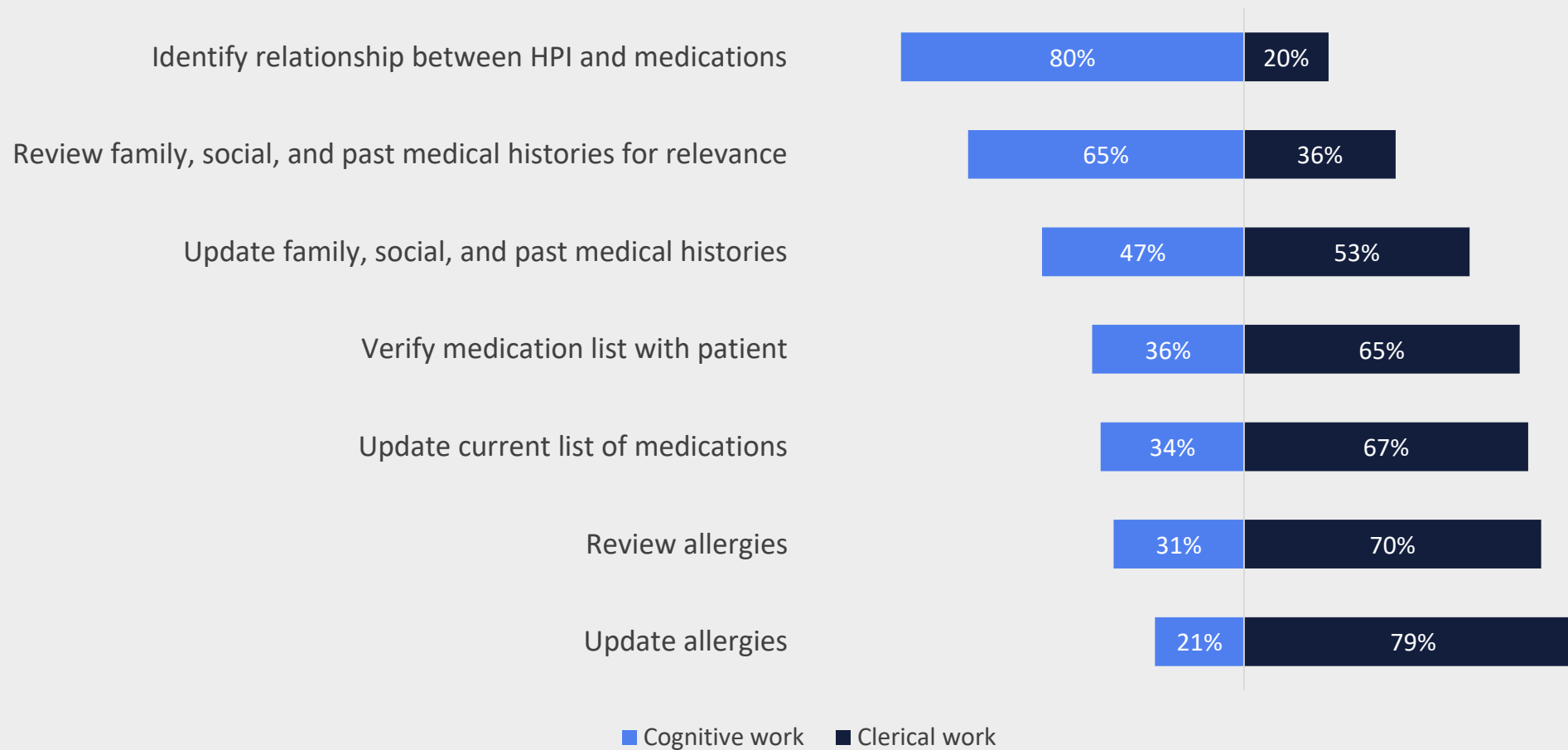
Providers' perceived type of work associated with tasks related to **history-taking**



Base: All qualified respondents in the national survey (n = 197); close-ended format

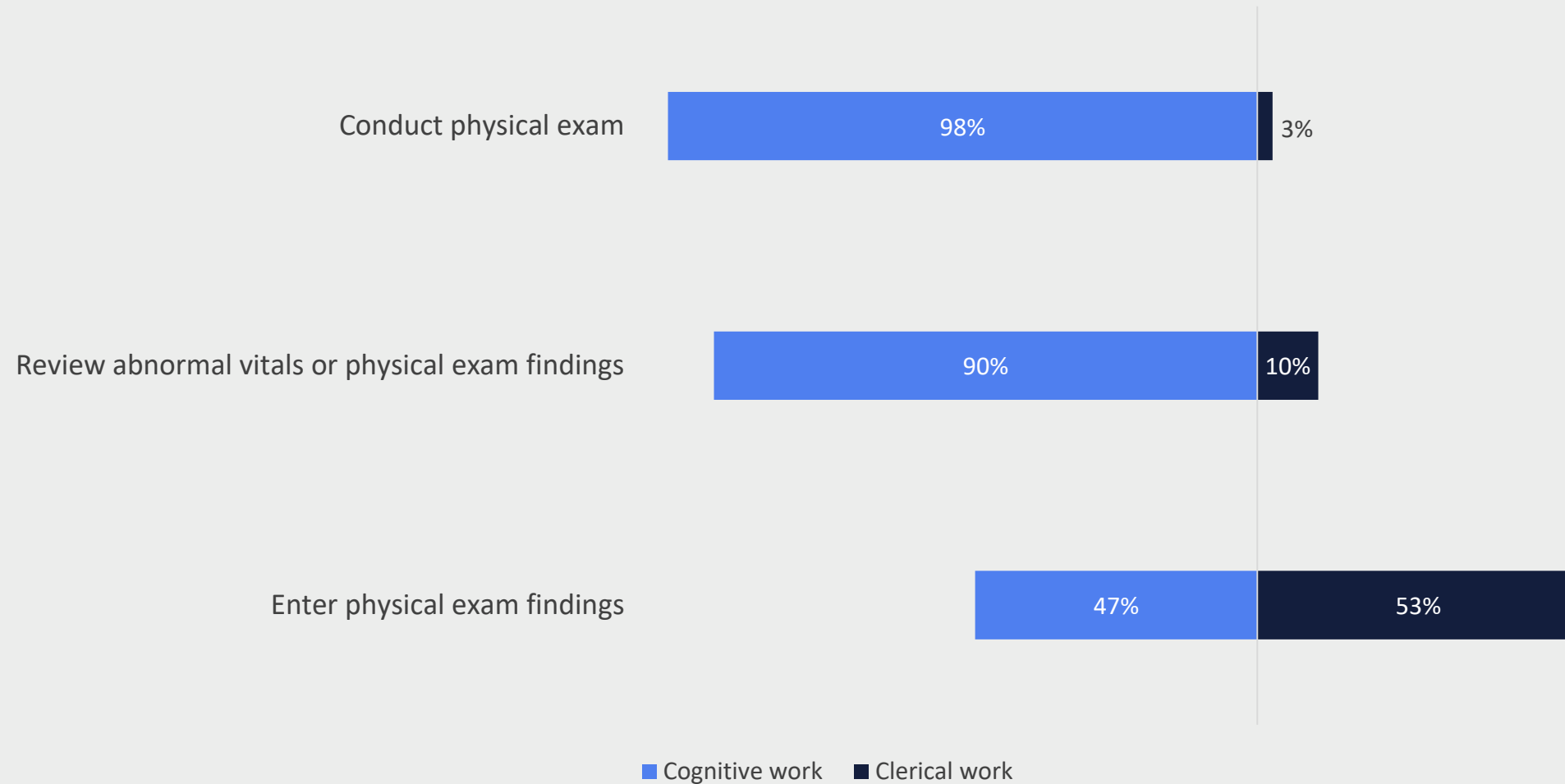
# Providers view verification and identification of allergies, current medications, and medical history as primarily clerical tasks

## Providers' perceived type of work associated with tasks related to **medications and medical history**



# Conducting a physical exam requires cognitive work, though documenting the findings is primarily a clerical task

Providers' perceived type of work associated with tasks related to **physical exam**



I. Documentation Workflow

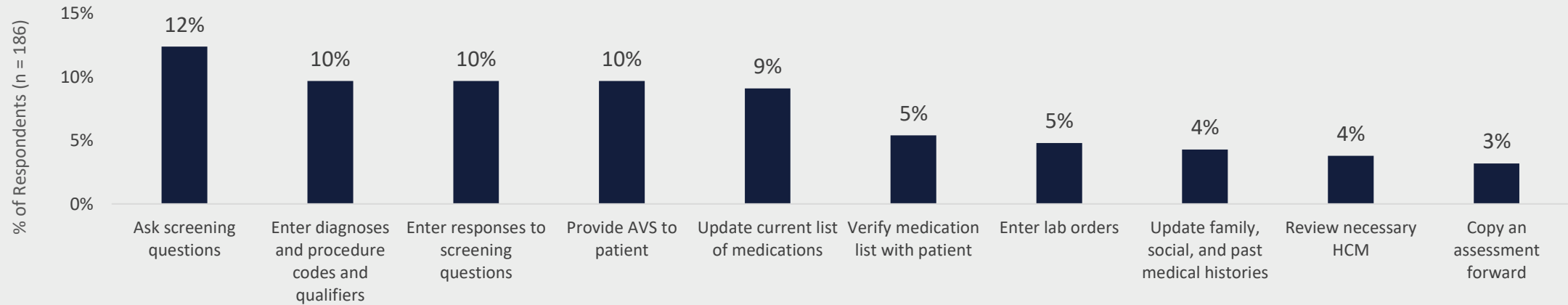
II. Perspectives on Documentation

# **III. Preferences for AI-Enabled Documentation**

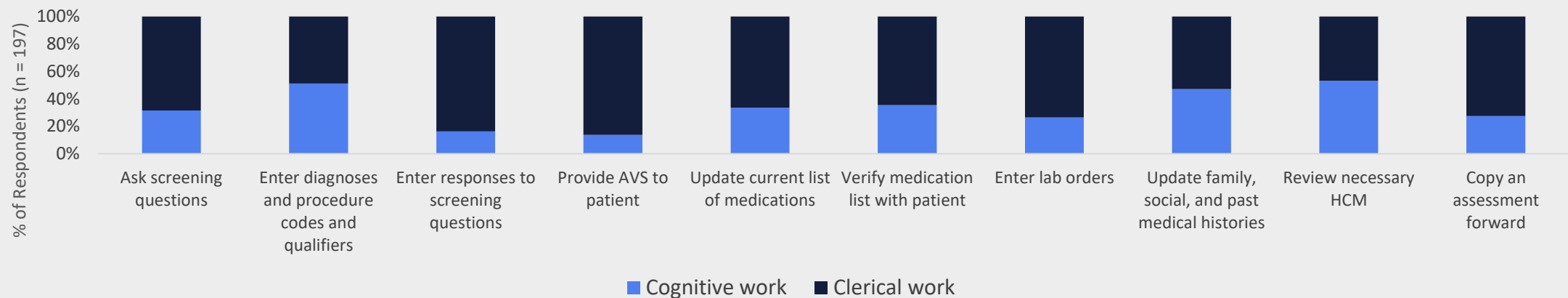
IV. Lessons from Scribe-Enabled Documentation

# Providers prefer to delegate tasks that most perceive as clerical work

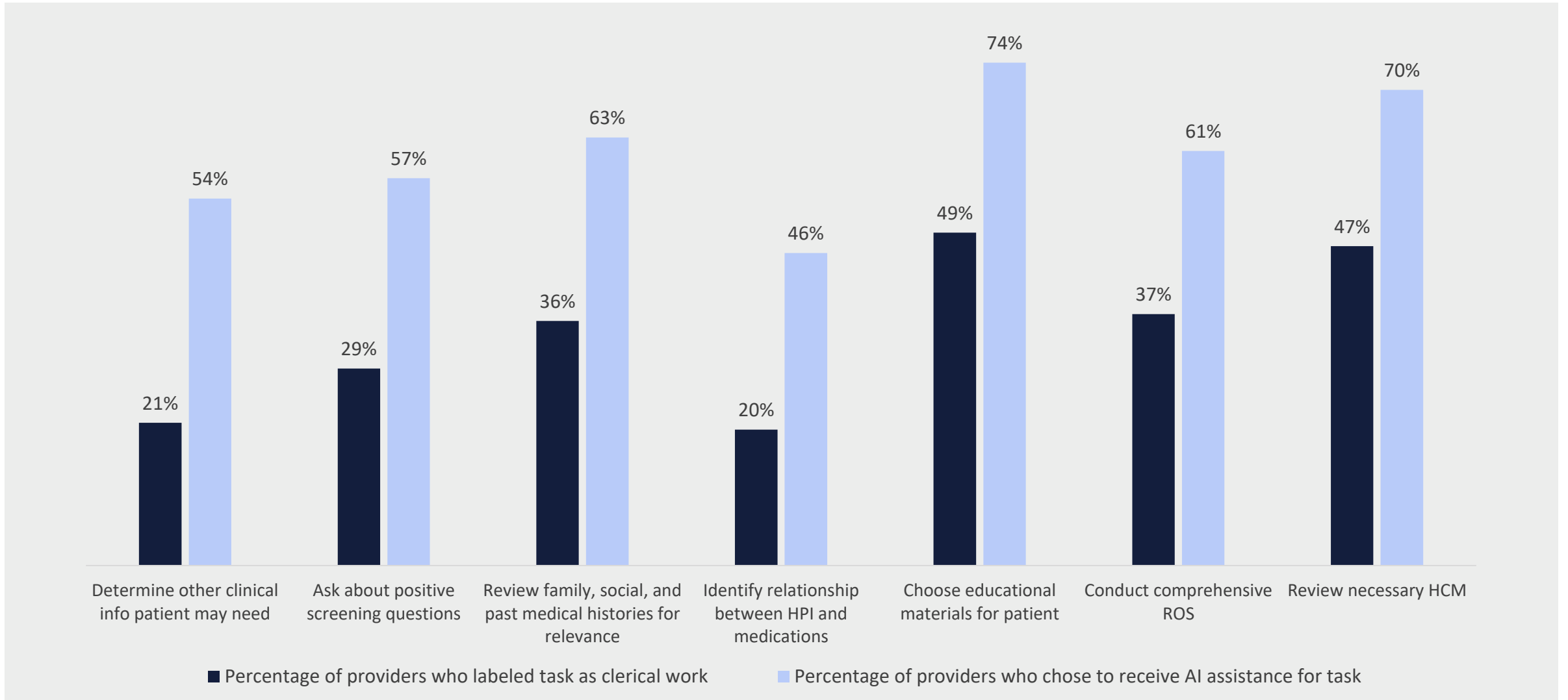
Which one task, across all task categories, providers most want to delegate (Top 10)



Providers' perceived type of work associated with tasks



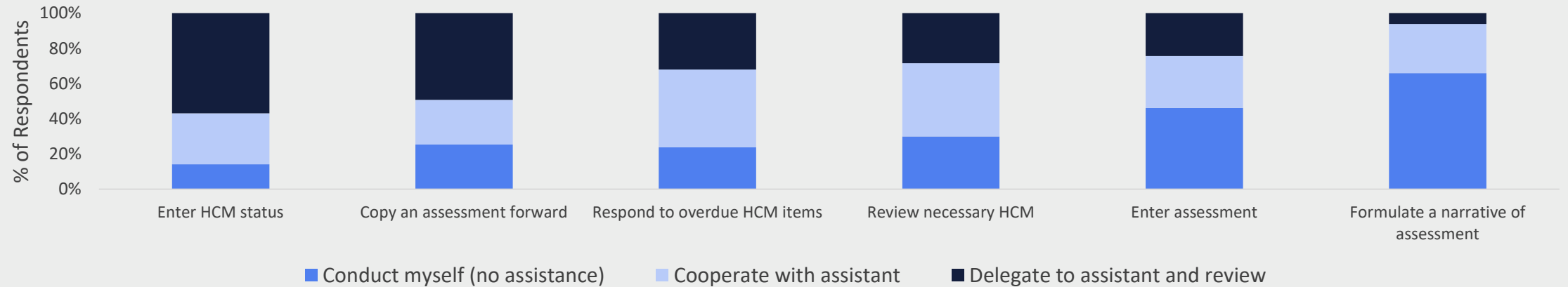
# In some cases, providers were also open to receiving AI assistance for tasks that most perceive as cognitive work



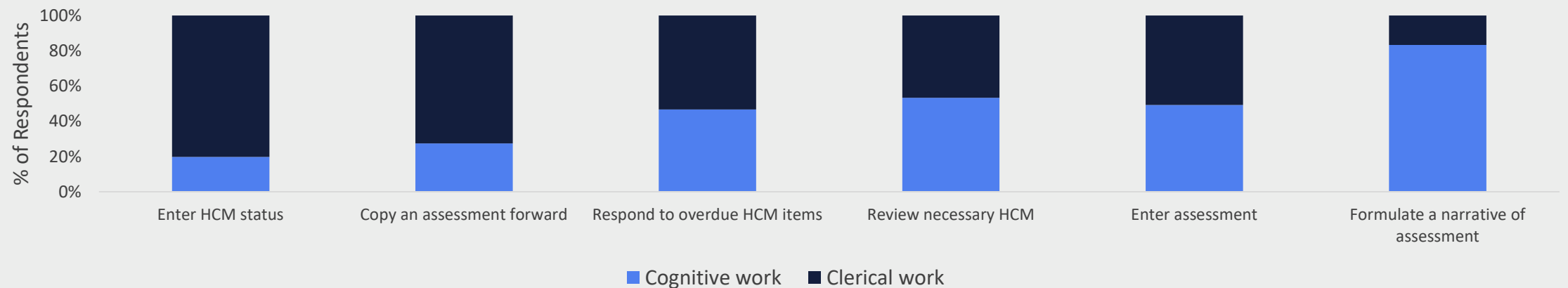
Base: All qualified respondents in the national survey (n = 197); close-ended format

# While providers prefer assistance with clerical tasks, assistance may also be helpful for some cognitive tasks, such as reviewing and responding to HCM

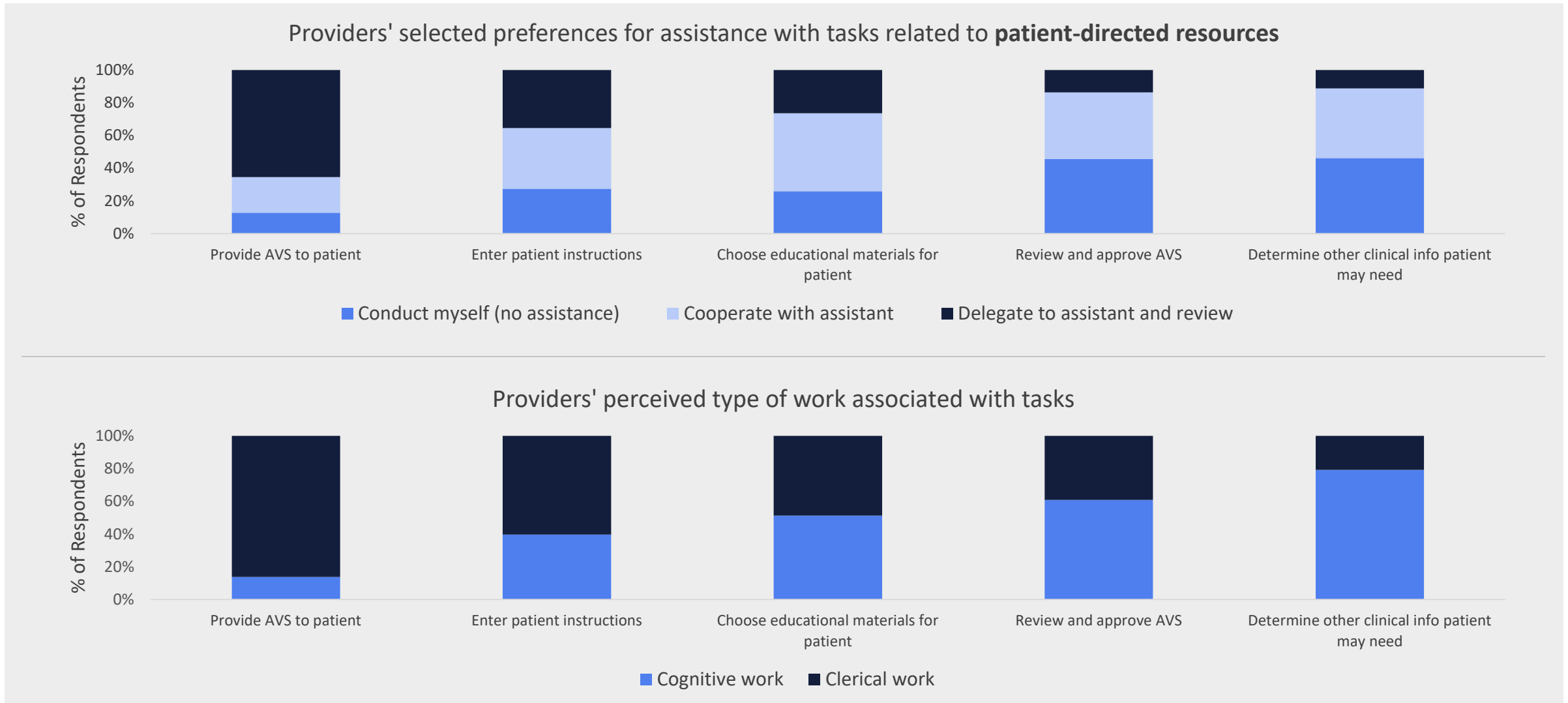
Providers' selected preferences for assistance with tasks related to **assessment and plan**



Providers' perceived type of work associated with tasks



# Providers are open to assistance with providing resources to patients, which is perceived as a primarily clerical task



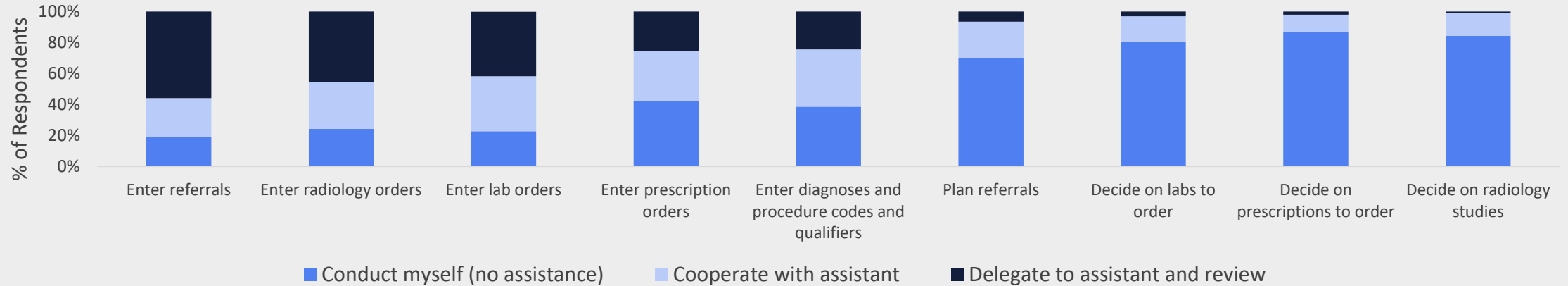
Base: All qualified respondents in the national survey (n = 197); close-ended format



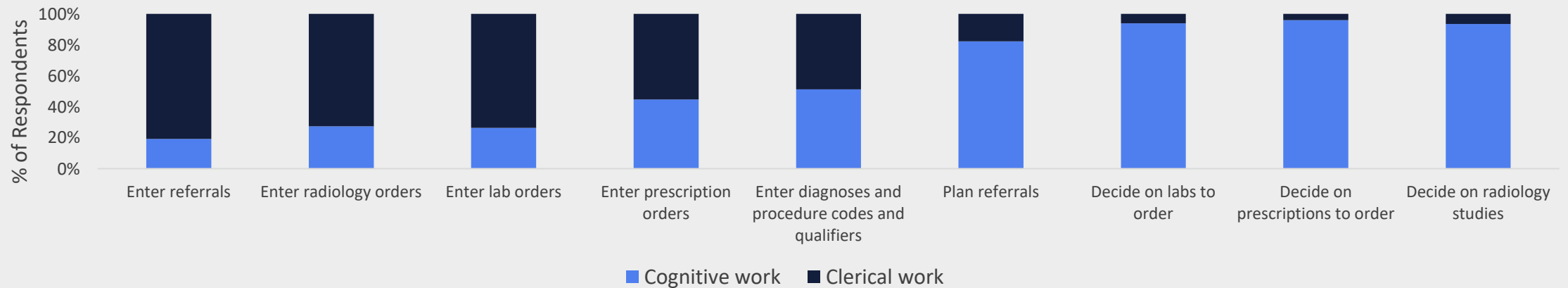
# Nearly 8 in 10 providers perceive entering referrals, radiology orders, and lab orders as clerical work and prefer to conduct these tasks with assistance



Providers' selected preferences for assistance with tasks related to **orders and referrals**

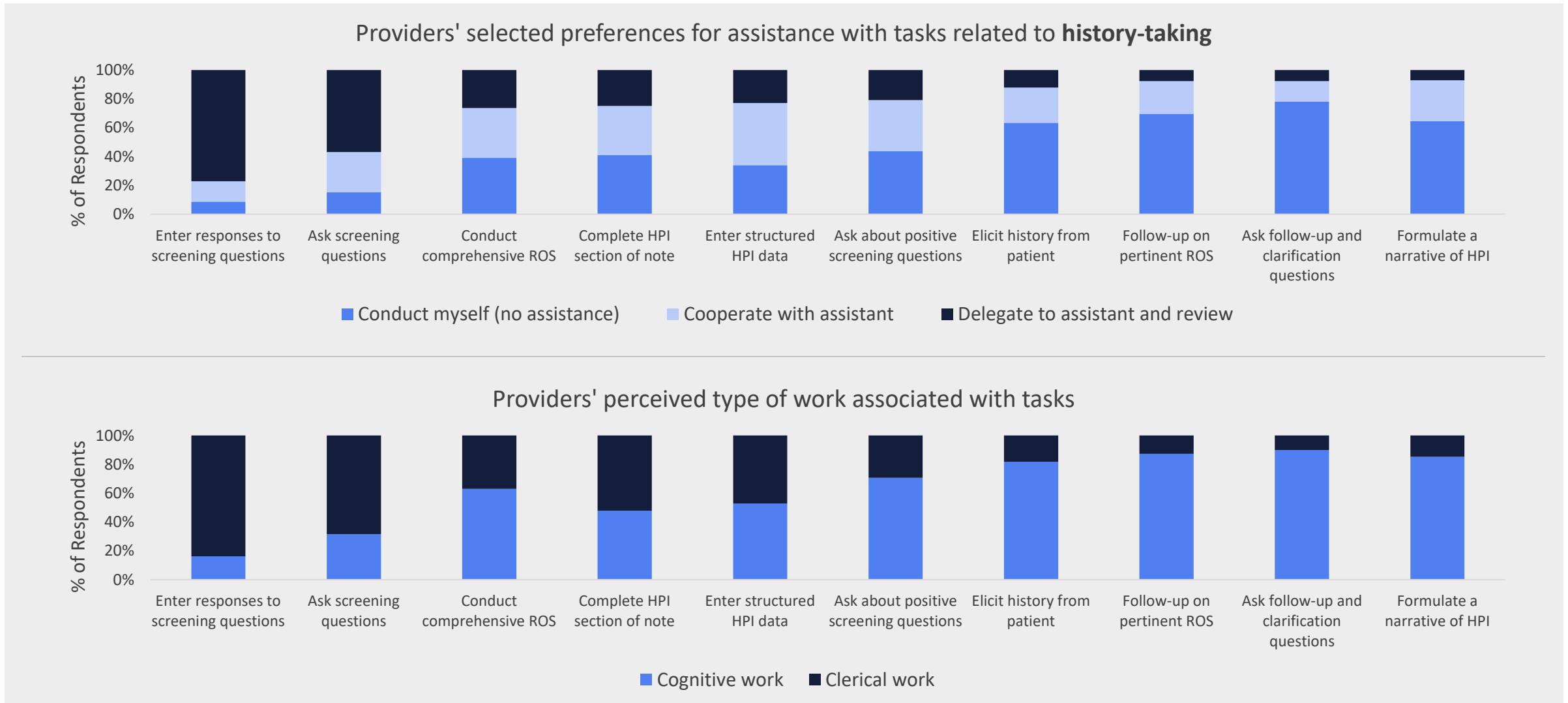


Providers' perceived type of work associated with tasks



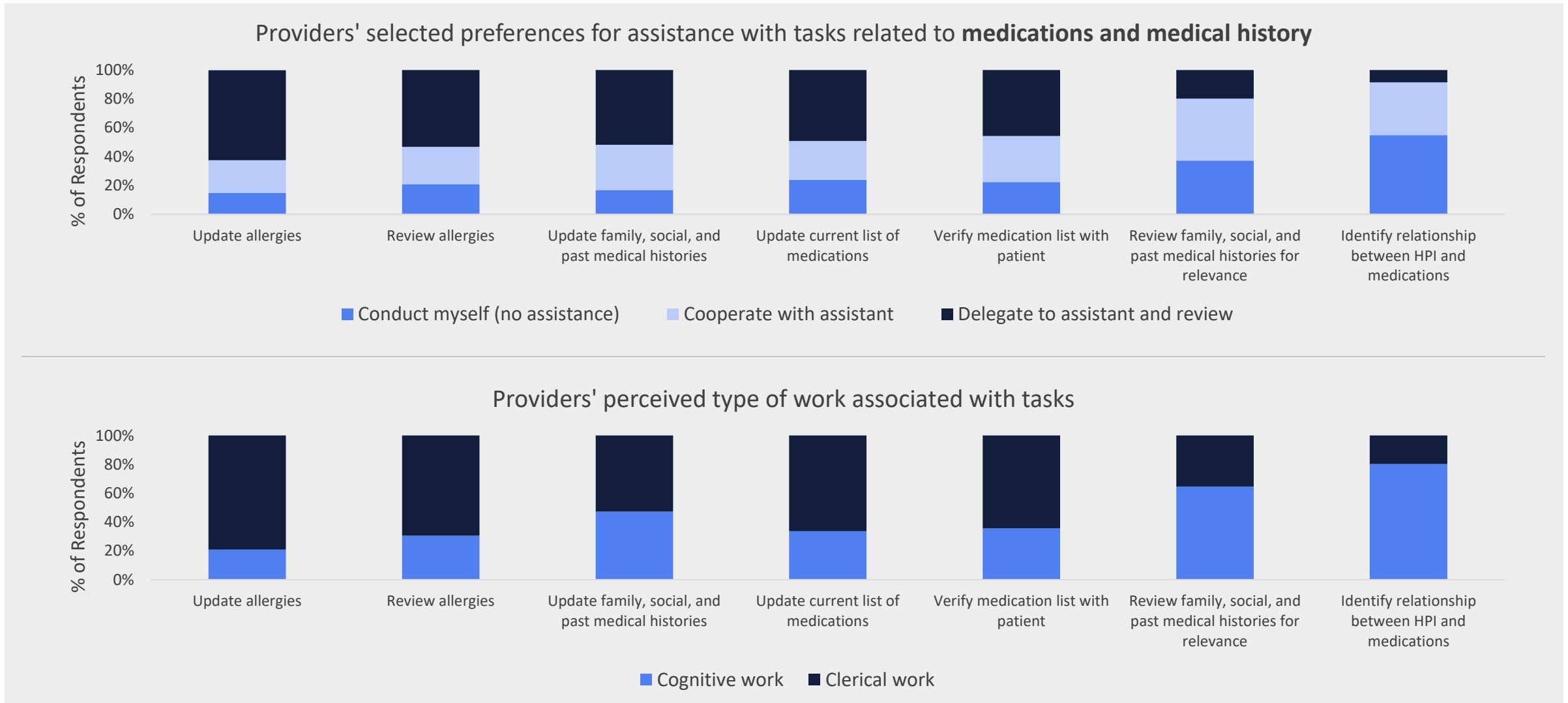
Base: All qualified respondents in the national survey (n = 197); close-ended format

# More than 80% of providers prefer to work with an intelligent assistant when asking or entering responses to screening questions



Base: All qualified respondents in the national survey (n = 197); close-ended format

# 7 in 10 providers perceive updating and reviewing allergies and medications to be clerical work and prefer to perform such tasks with assistance

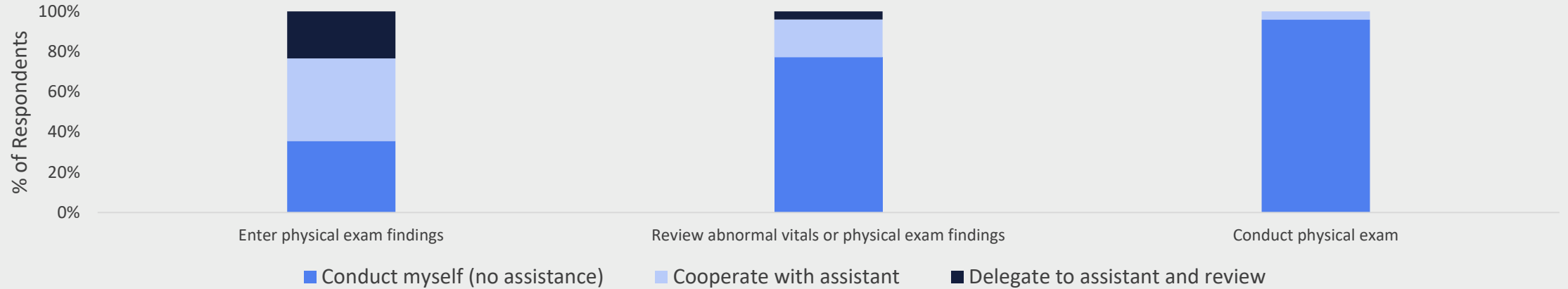


Base: All qualified respondents in the national survey (n = 197); close-ended format

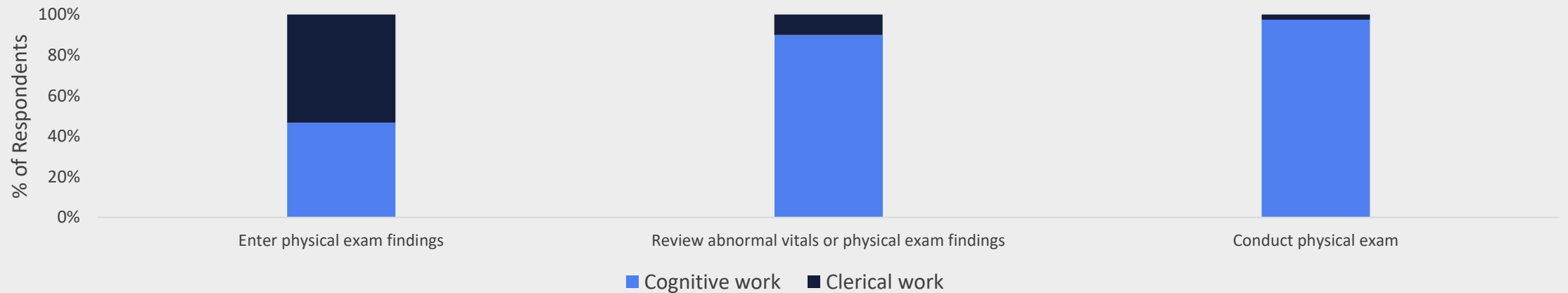
# Providers perceive the physical exam as cognitive work, yet 60% prefer to work with an intelligent assistant when entering exam findings in the EHR



Providers' selected preferences for assistance with tasks related to **physical exam**



Providers' perceived type of work associated with tasks



# Providers have a strong preference for the automation of patient encounter note documentation, in particular the history of present illness

Average rank of **documentation tasks** in order of highest priority for automated assistance to lowest (top to bottom)



- Section(s) of the patient encounter note
- Patient-directed resources
- Screening question responses
- Lab orders
- Prescription orders
- Radiology orders
- HCM status
- Referrals
- Problem list

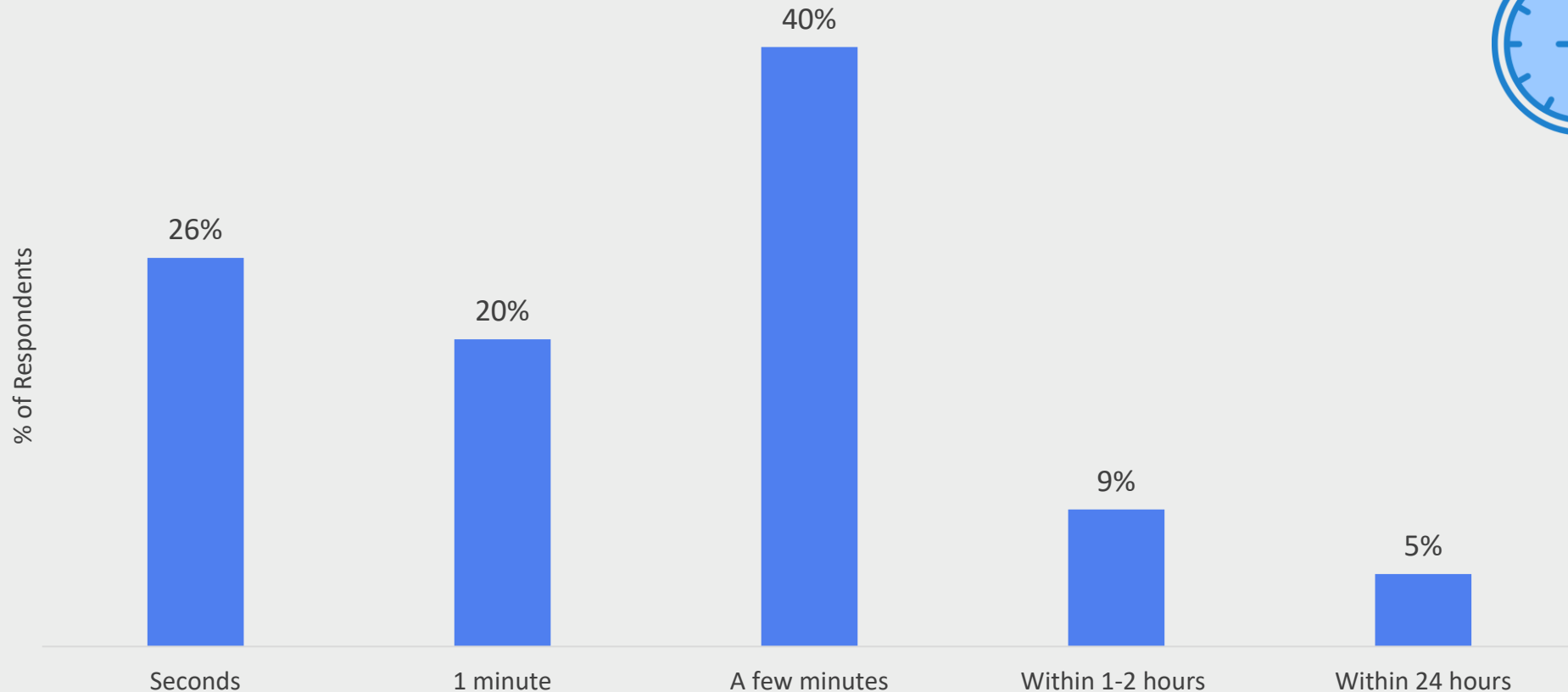
Average rank of **sections of the patient encounter note** in order of highest priority for automated assistance to lowest (top to bottom)



- HPI
- A&P
- Physical exam
- ROS
- Medications
- Family history
- Chief complaint
- Past medical history
- Social history
- Allergies

# In order to be acceptable to most providers, an AI assistant must complete tasks within a few minutes

The **maximum turnaround time** (after the close of an encounter) providers are willing to accept for completion of a delegated task



# AI-enabled documentation tools should be inconspicuous and provide high quality, accurate notes in a way that improves efficiency

## Note quality

“Would the HPI really have the same logical flow of a scribe?”

“Whether the note adequately captures the important parts of the visit”

“How does the technology incorporate known patient information (medical history, medications, etc.)...”



## Factors that PCPs would consider when deciding to use an AI-enabled documentation tool

## Time efficiency

“How much time it takes to edit later”

“The new system would have to save me time and allow me to close charts sooner”

“The speed at which it is generated. Right after the patient visit? Few hours after?”



## System design

“How many keystrokes do I still need to complete and is it straightforward?”

“...whether the system would be “intelligent” and able to evolve/adapt over time to match my style even better”

“Can I do a combination and still do some of my own charting while the system is working?”

## Impact on social dynamics

“Method of recording. Microphone? Bluetooth on my face? Non-invasive would be preferred”

“Whether it makes [the patient] uncomfortable or unwilling to share details”

“If the system can allow me more focused attention on my patient while in the room with them”

I. Documentation Workflow

II. Perspectives on Documentation

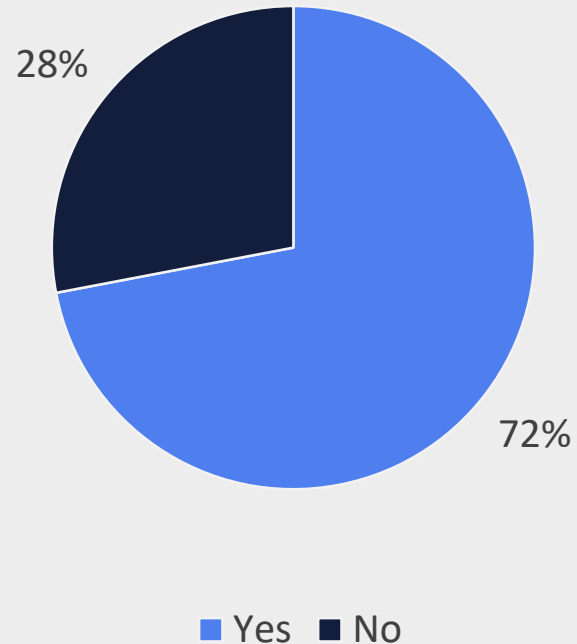
III. Preferences for AI-Enabled Documentation

**IV. Lessons from Scribe-Enabled Documentation**



## 7 in 10 providers would work with a scribe if cost were not a consideration

If cost were not a consideration, would you work with a scribe? Please explain why.



Providers who responded **"yes"** value:

- Time savings, efficiency
- Better care for patient
- More accurate, detailed note and EHR



Providers who responded **"no"** value:

- Personal control, "own way"
- Relationship and encounter with patient – third party is "awkward," "invasive," "weird," "intrusive"
- Own competency – "I'm a fast typer," "I don't have difficulty"

# Most of the benefits found in working with a scribe can be derived either through a human scribe or an AI assistant

## Time savings

“Far less time spent on the clerical task of documentation”

“Entering information that I don’t have to type in”

“Majority of note is completed before end of visit”



## Enhanced quality of care

“Scribes can document HPI and complaints thoroughly on the spot”

“Allows improved face to face communication with the patient”

“They can remind me of things that were said in the room that I might not initially have remembered to address”

## Greatest benefits of working with a scribe reported by PCPs

### Opportunity to mentor

“It is an opportunity to teach a learner”

“Mentoring is fun”



### Improved physician well-being

“Less panic in the room thinking ‘How am I going to get all of this down’”

“Emotional benefit of not feeling as drained trying to be a doctor and a typist at the same time”

# Human scribes require ongoing training and orientation, unlike AI-enabled documentation tools

## Scribes' limited experience and knowledge

“Very steep learning curve using medical terminology”

“Not understanding what is important to include, exclude”

“When first working together, the scribe is still learning how to navigate the EHR...”



## Decreased quality of documentation

“In the past, I’ve had [scribes] that either missed details or had a lot of typos”

“While they have been trained, their note structure is often not as organized...”

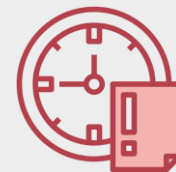
“...not pulling in as much information as I might prefer to put into the note...”

## Greatest challenges, initially, of working with a scribe reported by PCPs

### Added responsibility of teaching

“Making sure that scribe is learning something meaningful”

“I usually try to review patients with the scribe before visits”



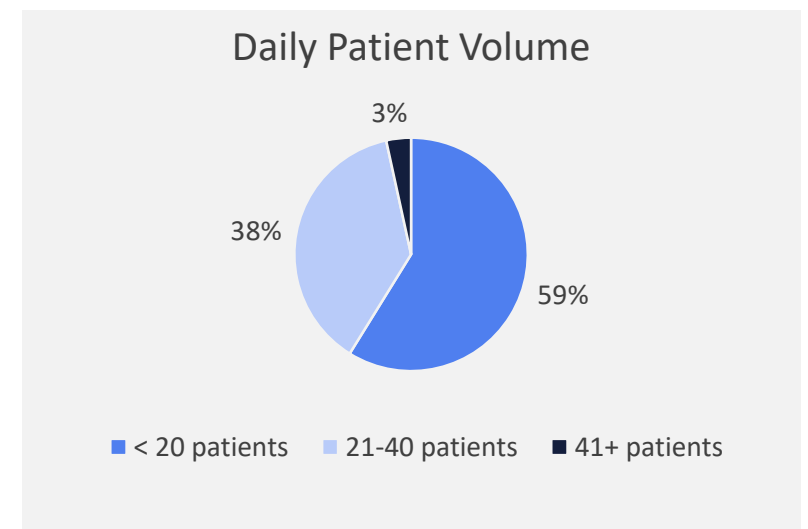
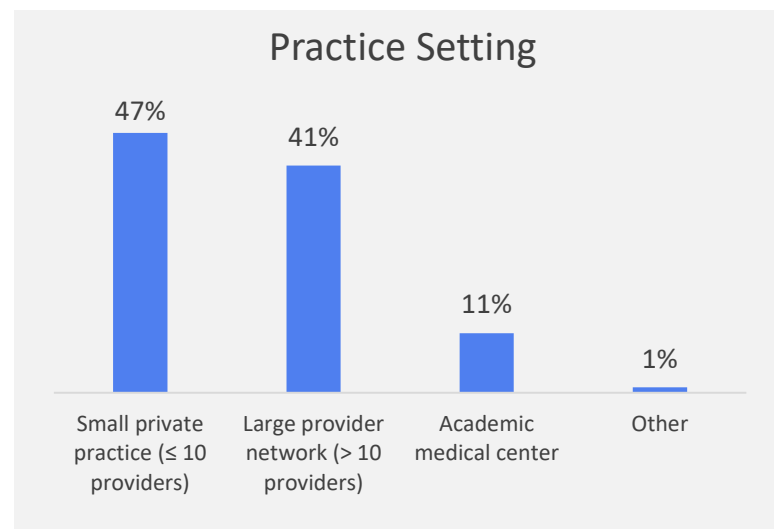
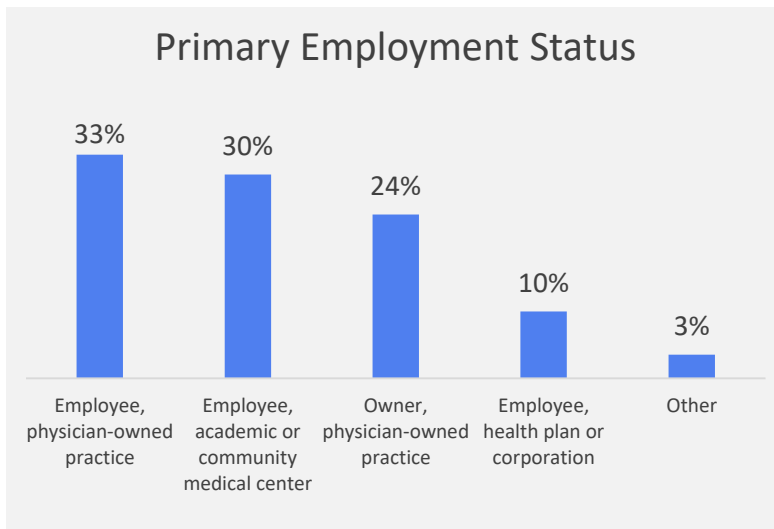
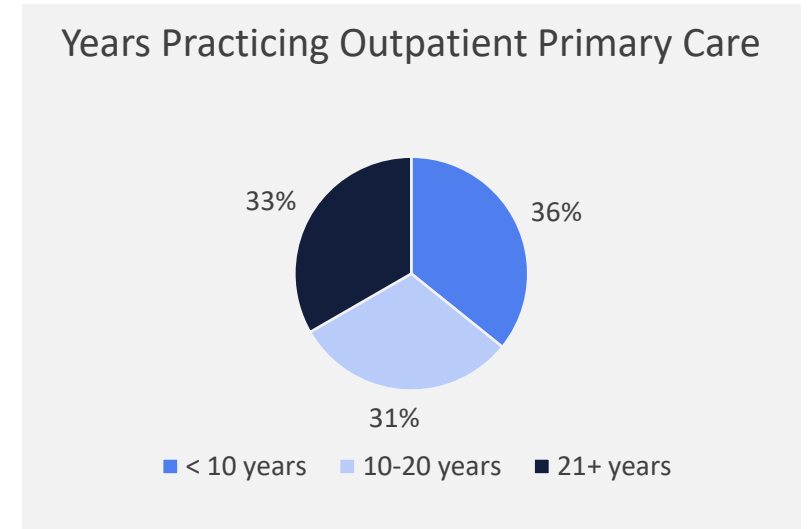
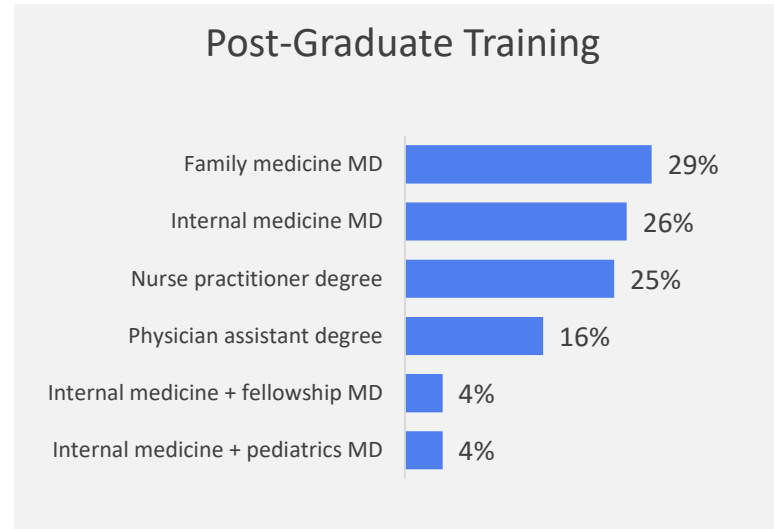
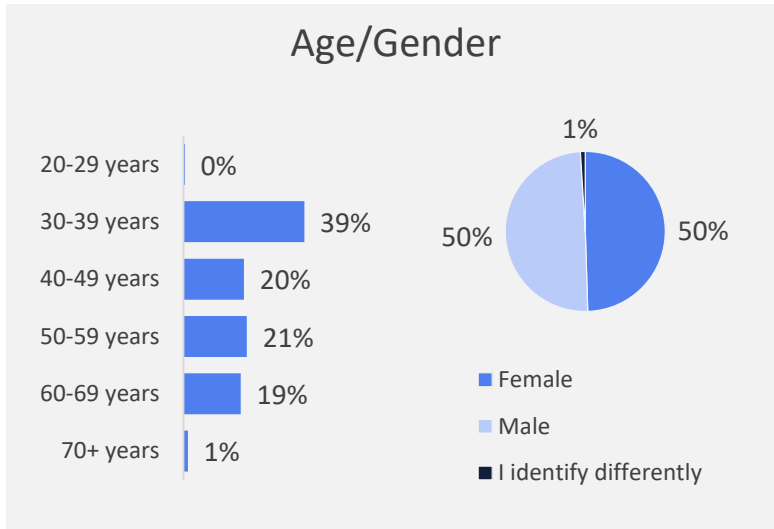
### Time spent waiting for scribes' notes

“Sometimes the delay of our scribes finishing the note results in my forgetting details I wanted to add”

“...sometimes the scribe may not be as quick as I am, given that I have quite a set routine”

# Participant Characteristics

# Participant Characteristics: National Poll

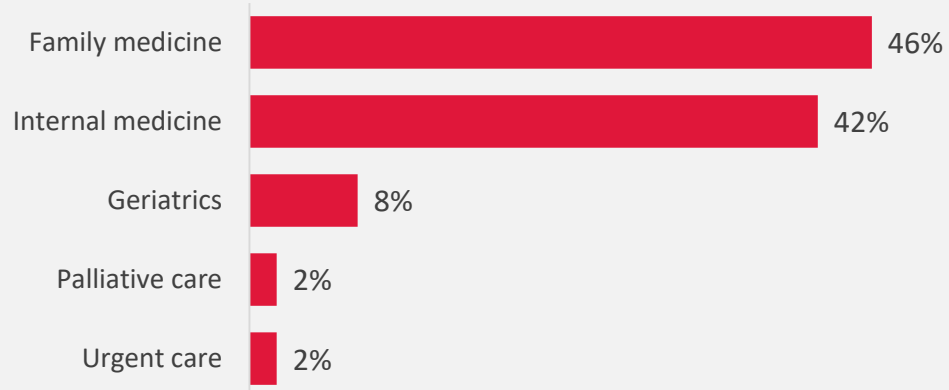


Base: All qualified respondents (n = 204)

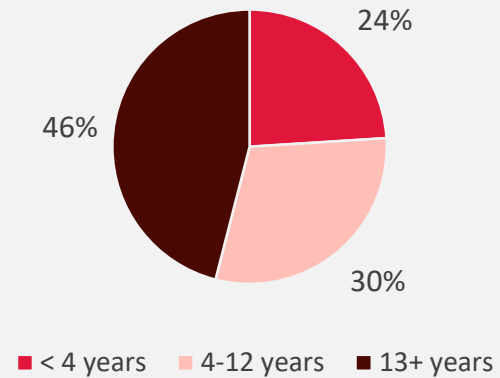
# Participant Characteristics: Stanford Poll



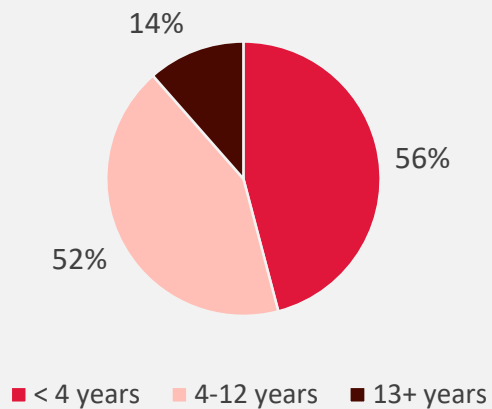
### Primary Care Specialty



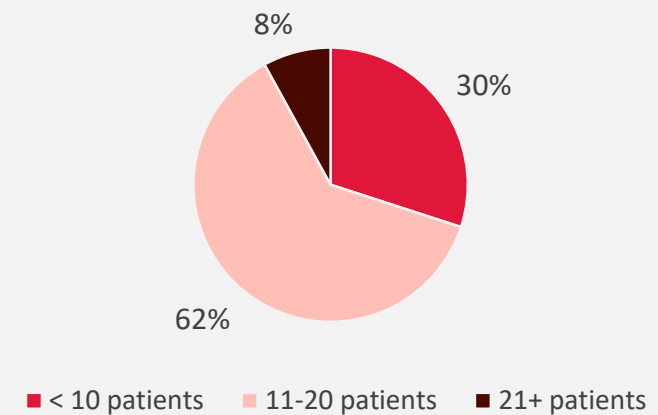
### Years Practicing Outpatient Primary Care



### Years Practicing at Stanford



### Daily Patient Volume



## Suggested Citation

Hong G, Wilcox L, Sattler A, Thomas S, Gonzalez N, Smith M, Hernandez J, Smith M, Lin S, Harrington R. (2020). *Clinicians' Experiences with EHR Documentation and Attitudes Toward AI-Assisted Documentation* [White paper]. Retrieved from Stanford University School of Medicine and Google Health: [med.stanford.edu/healthcare-ai](https://med.stanford.edu/healthcare-ai) and [health.google](https://health.google).