**Brief Description and List of Project Cards Given to Participants at the NYU Langone Health Prompt-a-thon to Educate Them on How to Utilize Generative Artificial Intelligence for their Daily Work**

At the NYU Langone Health Prompt-a-thon on August 18, 2023, and in subsequent events that have educated our workforce on how to responsibly use generative artificial intelligence in their daily work, participants could choose from various projects delineated by virtual “project cards” given to them before experimenting with their teams. Project cards are comprised of an overall theme, relevant data sources, and what we described as core tasks (e.g. summarization or transformation of a text), which were meant to show users how they can use generative artificial intelligence on a wide variety of clinical data and inspire them to innovate. All datasets were maximally de-identified through manual review by at least two independent reviewers who obscured all sensitive patient information.

**Types of Activities for Which Project Cards Were Created**

Diagnosis & Treatment, Patient Education/Patient Friendly, Clinician Efficiency, Equity, Research

**List of De-identified Data Sources Provided to Participants:**

History & Physical Admission Notes, Emergency Department Data, Hospital Courses, In Basket Messages and Responses, Grants Submission, Protocols, Literature Abstracts

Diagnosis and Treatment

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| Theme: | Diagnosis and Treatment | | |
| Source Material: | History and Physical Notes | | |
| Core Tasks | Task: | Example: | Sample Prompt: |
| Search | Search for Social Determinants of Health | Please identify all the social determinants of health in this clinical note, put them in list format and explain why you think each is appropriate. |
| Summarization | H&P that would be useful for a cardiologist | You should give me a summary of this clinical note. Your audience is a cardiologist who is trying to understand the patient’s heart problems. |
| Extraction | The key diagnosis and treatment from the H&P | All I want is for you to isolate what you think is the primary issue being presented about the patient in this note and then tell me what the clinician plans to do about it. |
| Verification | H&P has contingency planning in the assessment and plan | Please explain to me if this note contains adequate contingency planning, and why you believe that to be the case. |
| Classification | State the risk of this patient having an unanticipated ICU admission. | In your opinion, what are the chances this patient has of an unanticipated ICU admission? What makes you say that? I am a clinician. |
| Transformation | Document into something useful for nurse/consultant | You need to turn this note into a document that would be useful for a palliative care consultant who is about to see them for the first time. |
| Generation | Diagnosis and plan from H&P; missing diagnosis/missing plan | This H&P has no primary diagnosis or plan, can you give a suggestion about what those might be? Please explain every choice. |

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| Theme: | Diagnosis and Treatment | | |
| Source Material: | Emergency Department Notes | | |
| Core Tasks | Task: | Example: | Sample Prompt: |
| Search | What clinician wrote the document | Identify the writer of this document and their opinion about the situation. |
| Summarization | pertinent findings from the history and physical exam | Give me a paragraph that describes the patient’s physical exam in this note. Based on the rest of the note, is there anything you wish was included that is not present? |
| Extraction | Abnormal labs from the chart | What are all the abnormal labs present in this note? What do they mean for this patient? |
| Verification | Verify there are no internal inconsistencies in the document | Ensure that the writer of this document is not contradicting themselves within it. If so, identify the contradiction and what you think is correct. |
| Classification | Whether the diagnosis and treatment plan require the patient to stay in the hospital | Decide from this note about whether the patient is ready for discharge. Explain your reasoning. |
| Transformation | Transform document into summary of care for a referring provider | I am the primary care doctor who referred this patient to the service of the provider who wrote this note. Please turn this note into a summary for someone like me. |
| Generation | Create doctor’s note for a patient from clinical document. | Create a doctor’s note for this patient based on the below H&P that states they have an appropriate excuse for missing work and a general reason (do not state their primary diagnosis or any patient health information). |

Patient Education/Patient Friendly

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| Theme: | Patient Education | | |
| Source Material: | Discharge Narrative and Discharge Instructions | | |
| Core Tasks | Task: | Example: | Sample Prompt: |
| Search | For information on who the patient should call if problems | I am worried about the patient in this document. Help me find who I should contact in case this patient is unable to speak for themselves. |
| Summarization | For primary care doctor and patient to go over together. | Please summarize the following document into an understandable format for a patient with a high school education to go over with their doctor. Give me the next steps for this patient and their doctor. |
| Extraction | Extract all diagnosis | I want all the comorbidities that this patient has listed in their clinical note turned into a list. Put ICD10 codes next to them if able. |
| Verification | Verify document Includes diet | Please make sure this clinical note contains instructions on the patient’s diet. |
| Classification | How patient friendly the document is | Judge how much medical jargon exists in this note. Extract those words and suggest alternates. |
| Transformation | Make patient friendly | Turn the following clinical note into something a patient with poor health literacy would understand. Explain your reasoning for making the changes you made. |
| Generation | Recommendations to make the dc narrative or instructions more complete | Act like the author of this note’s clinical supervisor. Give them a few actionable items to improve in their documentation. |

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| Theme: | Patient education (Medication) | | |
| Source Material: | Discharge summary/Discharge Narrative | | |
| Core Tasks | Task: | Example: |  |
| Search | Search whether the plan for follow-up is described. | Please find me all the details in this clinical note that describe what doctors/clinic this patient should follow-up with. |
| Summarization | High risk medications | Give me a list of all the high-risk medications listed in this clinical note, explain your reasoning, and highlight any new high-risk medications. |
| Extraction | Medications and Doses | Based on this note, I need to know every medicine this patient will be leaving the hospital on, their doses and frequencies, and how long they are prescribed for. |
| Verification | Verify there are no drug-drug interactions | Ensure that any of the new medications do not interact with the home medications that they will remain on after leaving the hospital. If you notice an interaction, let me know and show me alternatives. |
| Classification | Classify the reading level of the document | Determine the reading level of this document and make a classification on whether this clinical document is understandable for the average patient and why. |
| Transformation | Transform the data to display medications and administration times (am/pm) in an easy-to-read table | Create a readable table of medications, administration times and doses from this document. It should be easy to understand for a patient leaving the hospital with poor health literacy and low family support. |
| Generation | Recommend medication administration times based on current best timing practice | Utilize the table of medications you just created with administration times and optimize those times based on current best practices for medication compliance. Highlight what you changed and explain why. |

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| Theme: | Patient education | | |
| Source Material: | In Basket Message-Response Pairs | | |
| Core Tasks | Task: | Example: |  |
| Search | Find all patient messages about diagnostic tests. | From this list of patient messages, please extract all those asking about lab or imaging tests. |
| Summarization | Summarize how well the patient message was answered by the respondent. | In one sentence, using the patient message, its subject, and the response from the care team, please summarize the exchange and determine whether it was resolved or not. |
| Extraction | For medication refill requests, extract the medication being requested. | Find me all the patient messages about medication refills, and then create a list of all medications being requested |
| Verification | Ensure the patient’s request was answered appropriately. | Ensure that each exchange has an adequate response to a patient message, explain why you do or do not believe that was the case. |
| Classification | Divide patient messages into urgent vs non-urgent requests. | Label each of the patient's messages based on their urgency. |
| Transformation | Response into more empathetic language | Turn the response to the patient message into something that you think a layperson would rather receive from their doctor’s office. |
| Generation | Create a list of responses to a given patient message. | Create multiple responses to a patient message based on the role of the author (e.g., primary care physician, nurse practitioner, administrator). |

Equity

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| Theme: | Equity (Evaluate clinical data for bias and patient-centered-ness) | | |
| Source Material: | ED Data, H&P | | |
| Core Tasks | Task: | Example: | Sample Prompt: |
| Search | Identify indicators of the patient’s race, ethnicity, wealth, income, occupation, and/or education level. | Isolate into a list all indicators of the patient’s socioeconomic status from this clinical note. Comment on what you think their status is based on the evidence. |
| Summarization | Describe why the patient was admitted to the hospital. | Describe the patient’s primary problem and whether you think any social determinants of health could have played a major role. |
| Extraction | Extract any positive descriptors of the patient or their behavior, for example, compliments or shows of approval. | Extract any indicators of bias and negative descriptors of the patient or their behavior, for example, resistant, refusing, agitated, difficult or noncompliant. |
| Verification | Ensure there is shared decision making with the patient in formulating the assessment and plan. | Please verify whether there is evidence the clinician participated with the patient in shared decision making when constructing their plan. Explain why you think so. |
| Classification | Rate how patient-centered the document is. | Considering the use of negative and positive descriptors and inclusion or exclusion of evidence for shared decision making, I need you to classify the H&P as high, moderate, or low in terms of patient-centered-ness. |
| Transformation | Increase patient trust in the medical team. | Without medical jargon, please use the H&P to create a one paragraph explanation to the patient about why they are being admitted to the hospital that communicates the team listened to their complaints. |
| Generation | Create an alternative assessment and plan. | Review the ED Data and History section of the H&P to create an assessment and plan. Describe the differences between your assessment and plan and the one in the H&P. |

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| Theme: | Equity (Evaluate research article with an equity lens) | | |
| Source Material: | In Research Materials One Drive:  Assessment of Racial/Ethnic Disparities in Hospitalization and Mortality in Patients With COVID-19 in New York City in JAMA  <https://jamanetwork.com/journals/jamanetworkopen/fullarticle/2773538> | | |
| Core Tasks | Task: | Example: | Prompt Example: |
| Search | Look for included racial and ethnic groups. | Review the article and identify the racial and ethnic groups included in the dataset. Identify groups that may be missing and state these. |
| Summarization | Summarize the article. | Review the article and provide a 3-sentence description of the conclusions. |
| Extraction | Extract the racial and ethnic demographic data. | Review the article and provide the absolute number and percentages of participants in each racial and ethnic group.  Compare these percentages to those in the New York City metropolitan area. |
| Verification | Ensure that race and ethnicity were collected from patients appropriately. | Review the article and tell me whether race and ethnicity were collected by self-report.  Tell me what percentage of patients had missing data for race or ethnicity. |
| Classification | Rate the health equity experience of the authors. | Extract the name of the first and last author and rate their experience with work in health equity as high, moderate, or low based on the number of publications they have in the space. |
| Transformation | Provide useful information for a lay audience. | Create a one paragraph explanation of this work for Black and Hispanic populations highlighting actions they can take to decrease the likelihood of COVID-19 morbidity and mortality. |
| Generation | Explain how socioeconomic status was used in the analysis. | Generate an argument for the use of socioeconomic status data in controlling the outcomes described in the article. |

Clinician Efficiency

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| Theme: | Clinician Efficiency (Case Management) | | |
| Source Material: | H&P | | |
| Core Tasks | Task: | Example: |  |
| Search | Abnormal physical exam findings | Please list out all the abnormal exam findings and what you think that might mean in the context of this clinical note. |
| Summarization | Plan of Care | I am a medical student, please summarize the plan of care in this note and describe to me what you think the author’s reasoning was for each decision. |
| Extraction | Chronic diagnoses and correlating medications | I want you to find me all the chronic comorbidities written about in this note, and to place all the corresponding medications to each diagnosis. Please make suggestions about new medicines this patient should be on. |
| Verification | Diagnosis, ICD/CPT code are correct | In your opinion was the primary diagnosis or differential correct/complete? What else are you thinking about? |
| Classification | The condition for which they were admitted to the hospital and the projected healing/care time | Why was this patient admitted to the hospital? Determine whether you think the patient has already recovered, needs a few more days of recovery, a few more months. |
| Transformation | Transform data into a Case management plan of care/note | Turn this clinical note into a detailed care management plan that a social worker can go over with this patient prior to discharge. |
| Generation | Recommended additional modalities/care plans to aid in the timely discharge of the patient | Identify all the missing components of this note, provide recommendation on what to include in each section. Focus on ensuring timely discharge of the patient and explain how each component does that. |

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| Theme: | Efficiency | | |
| Source Material: | H&P | | |
| Core Tasks | Task: | Example: | Prompt Example: |
| Search | Look for antibiotics. | Find all the antibiotics listed in this note and what their indications are both generally (diagnosis) and microbiologically (bug they are treating for) |
| Summarization | Ask for a description of why the patient was admitted to the hospital. | Summarize the patient’s primary problem, describing why you believe this is the case and whether any diagnoses seem more likely. |
| Extraction | Extract the differential diagnosis. | Find me the author’s differential diagnosis and the evidence supporting it. State whether you agree or not. |
| Verification | Ensure that all components of the H&P are present | Do all the expected components of the admission note present? Is this an oversight or purposeful removal? How should this note be improved? |
| Classification | Whether the note should be billed at a level 1, 2, or 3 | Determine whether this note indicates low, medium, or high complexity of clinical thought processes. |
| Transformation | Into a letter to update the primary care provider about the patient’s admission | This clinical note should be converted into something that can be delivered to the patient’s primary care physician with anticipated discharge dates and follow-up plan. |
| Generation | Create shift handoff. | Generate a shift handoff in the IPASS (illness severity, patient information, action list, situational awareness, synthesis by receiver) format using the H&P note below. Focus on detailed contingency plans and produce 1-2 questions that prompt the receiver of the information to repeat back what was in the handoff. |

Research

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| Theme: | Research – transform a project summary into a specific aims page | | |
| Source Material: | R01 Grant Project Summary | | |
| Core Tasks | Task: | Example: | Sample Prompt: |
| Draft | Draft a full specific aims page based on the project summary provided | Here is a research project summary. Give me at least 3 specific aims with descriptions underneath. |
| Evaluate | Identify potential weaknesses of this proposed study | What might be the weaknesses to this proposed study? How do you suggest the authors improve the design? |
| Identify alternatives | Generate alternative designs that address potential weaknesses | Use this project summary to propose a number of projects with a variety of study designs and your reasoning why it could be important for generalizable knowledge. |
| Enhance | Propose rigorous measures for the study | What would be additional study measures that can be used to evaluate the study hypotheses? |
| Contextualize | Identify relevant literature that would strengthen the proposal | Improve the background and significance section of the specific aims page. Add supporting references. |
| Optimize | Test various language, format, styles, “voices,” to enhance the proposal | Make the tone more scientific. Make the tone more colloquial. Add a stronger narrative voice to the proposal. Reorganize the structure of the proposal in 3 different ways for me to compare. |
| Equity | Propose versions that would study this problem from an equity perspective | Revise the proposal to directly address the equity issues related to these research questions. |
| Compare | Compare the proposal to the original and evaluate pros/cons | Compare the proposal to this specific aims page “””xxx”””. Which is more likely to get funded by the NIH. |

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| Theme: | Research – analyzing and understanding a specific aims page | | |
| Source Material: | Specific Aims examples (redacted) | | |
| Core Tasks | Task: | Example: | Prompt Example: |
| Summarize | Summarize key points of the aims | This is a specific aims page from an NIH (National Institutes of Health) grant. What are its key objectives? What is the significance of these objectives? |
| Classify | What type of study design is proposed? | What is the research study design proposed? |
| Transform | Transform the aims page into a table with its key components. | Convert this aims page into a table with the following sections – significance, design, methods, measures, analysis. |
| Identify alternatives | Generate alternative designs | What would be alternative study designs to the one proposed? |
| Classify | Classify what NIH study section this proposal should be sent to | Based on the specific aims, what NIH study section should this proposal be sent to? |
|  | Transform | Transform the aims page into a general audience summary | Write a lay audience summary of this NIH specific aims page. The language should be accessible to non-experts. Here is the specific aims page: “””xxx””” |

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| Theme: | Research | | |
| Source Material: | Aims pages | | |
| Core Tasks | Task: | Example: | Prompt Example: |
| Generate | Outline an introduction section from an aims page | This is a specific aims page from an NIH R01 grant, and I want you to provide a detailed outline for an introduction to the grant. The introduction should be 6 paragraphs long, and each paragraph should contain 4-6 sentences. Provide an outline with bullet points for what should go in each sentence. |
| Identify alternatives | Suggest different ways to order the information in the introduction | What would be alternative ways to order the information in the introduction? |
| Compare | Compare the new introduction structure to the original and propose pros/cons | Compare this version to the original introduction structure “” “xxx”””. Which is more likely to persuade a grant reviewer that the proposal is worth funding? |
| Analyze | Assess the introduction outline for logical weaknesses | What information is missing from this introduction that would strengthen it? OR can you identify any logical gaps in the way the information is presented? |
| Optimize | Rewrite the outline using any new information or suggested structural rearrangements | Using your analysis of missing information/logical gaps, restructure the outline |
| Identify alternatives | Suggest outlines that structure the approach section differently | What would be alternative ways to organize the information in the approach section? |
| Compare | Compare the new approach outline to the original and propose pros/cons | Compare this version to the original approach section outline “” “xxx”””. Which is more likely to persuade a grant reviewer that the proposal is worth funding? |
| Generate | Describe the preliminary data that would be most convincing to a reviewer of this grant proposal | Based on the introduction and approach outline “””xxx””” what preliminary data should be included to convince the NIH to fund this proposal? |

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| Theme: | Research: Literature and Abstracts | | |
| Source Material: | Abstracts of Heart Failure Review Papers.docx | | |
| Core Tasks | Task: | Example: | Sample Prompt: |
| Summarization | Summarize the main findings of the reviews | What are the main findings from the following papers? If there is any overlap describe if the papers agree or disagree with one another. |
| Extraction | Number of participants | How many study participants are in each study described? Could you list all those with similar study design in groups with that number next to them? |
| Classification | Classify the type of review | What type of review paper is this? Does the methodology make sense for a review of this type? |
| Transformation | Create a table of the results | Create an easily digestible table from the results of this paper. Act like I am a student trying to better understand research methodology. |
| Generation | Create a follow up research plan based on these papers | Produce a few possible studies that should follow up this paper. Describe the methodology and purpose of each. |