Supplementary File: Design features of provider- and patient-focused alerts

General Comments on Development and Implementation:

Healthcare administrators from our partner institution (Eskenazi Health) contributed the boundaries within which we could develop and implement any intervention, and encouraged the use of decision support and videos to address knowledge and practice gaps identified in our preliminary work. The planned intervention was supported by administrators through periodic communication during the development and implementation planning phases, and their support for the objectives was shared in the introductory statements of the BPA itself as well as in provider meetings.

The provider-focused BPAs were constructed within the existing boundaries of the alerting mechanism established within the EPIC™ program. Multiple BPA's were generated to address multiple indications available for the target group of medications, as well as the messaging for new or prevalent use. Alerts were triggered when entering an order for a target medication (incident users) or when opening a patient's chart on the day of a visit (prevalent users).

Prior to implementation, a pilot phase was conducted at one intervention site for one month. Following this pilot, feedback from providers was invited to both confirm the alerts were triggered and revise the alert to improve efficiency and impact. Providers confirmed the presence of the alert but had no feedback to revise the performance of the alert.

Supplementary Figure S1: Initial Best Practice Advisory notification

The figure below represents an example of the window that is initially shown when a provider opens the record of a patient who is a target anticholinergic user on the day of a visit. The message identifies the presence of a medication and creates a social norm of medication safety adopted by the system, and raises awareness to the availability of an alternative. The goal of the alert is to direct the provider to the smart set. The design of the alert follows the standard Best Practice Alert model available within the Epic® medical record system.

Supplementary Figure S2: Example Provider Order Set

Upon selecting the "Accept" or "Open SmartSet" buttons from the initial alert, providers are directed to the window shown below in Figure 2. This window personalizes taper schedules to a safer alternative based on the original target anticholinergic, indication (not shown in this example as the class primarily treats a common symptom) and dose. Providers select the medication and dose currently used, and the SmartSet automatically populates order characteristics along with directions for a titration to safer alternative. The intent of the auto-populated orders was to reduce the cognitive workload required of providers in selecting and titrating to a safe alternative medication. The auto-populated order could be edited by providers as desired.

Design features of the patient-focused videos and alerts to medical assistants

General Comments on Development and Implementation:

Healthcare administrators from our partner institution (Eskenazi Health) contributed the boundaries within which we could develop and implement any intervention, and encouraged the use of decision support and videos to address knowledge and practice gaps identified in our preliminary work. The planned intervention was supported by administrators through periodic communication during the development and implementation planning phases.

Medical assistants were provided background education on the video content and purpose, though no script was provided for their introduction of the video to the intended patient. Like the provider-focused best practice alerts, the medical assistant alerts were piloted at one intervention site for one month prior to implementation. Following this pilot, feedback from medical assistants was invited to both confirm the alerts were triggered and revise the alert to improve efficiency and impact. Based on this feedback, revisions to the timing of the alerts were made to better align the alert with workflow.

Alert description

The alert shown in figure 1 of the main text was presented to medical assistants either by opening a flowsheet to enter vitals or opening the patient chart on the day of a visit for patients with an active order for a target anticholinergic medication during the study period. The alert

reminded medical staff of the importance of patient safety, vulnerability of older adults, and an indicator to play one of three videos offered to patients. Staff had the ability to indicate whether the video was given to the patient, not given, or to dismiss the alert.

Supplementary Figure S3: Video Description

The animated awareness videos were written and produced by the IU Brain Safety Lab working with a digital storyteller and a graphic animator. Each of three videos tells the story of an older adult (with variations in sex, race, and Hispanic origin) who learns about anticholinergic medications, then consults with a physician or pharmacist about their personal risk and safer alternatives. The videos, ranging in duration from 3.5-4.5 minutes, address multiple topics including symptoms treated by anticholinergic medications, potential risks of anticholinergic use, the availability of alternatives, and the importance of consulting with a clinician.

Upon the recommendation of our partner institution's leadership (Eskenazi Health), we translated the patient-focused videos into Spanish language to accommodate a large Hispanic/Spanish population cared for by the system. The alerts were also redesigned to display the language-stratified video based on language preferences stated in the EMR.