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The Automated Self-Administered 24-Hour Dietary Recall (ASA24): A Resource for Researchers, Clinicians and Educators from the National Cancer Institute

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Key Phrases

24-hour dietary recall; dietary assessment

Extensive evidence has demonstrated that 24-hour dietary recalls (24HDRs) provide high-quality dietary intake data with minimal bias, making them the preferred tool for monitoring the diets of populations and, increasingly, for studying diet and disease associations (1-3). Traditional 24HDRs, however, are expensive and impractical for large-scale research because they rely on trained interviewers, and multiple administrations are needed to estimate usual intakes. To address these challenges, the National Cancer Institute (NCI), in collaboration with the research firm Westat (Rockville, MD), and with the support of other institutes and offices at the National Institutes of Health, developed the Automated Self-Administered 24-hour dietary recall (ASA24) (4-6). ASA24 is a public-access, freely available, web-based tool for researchers, clinicians and educators, modeled on the Automated Multiple Pass Method (AMPM) (7). Development of an automated self-administered 24HDR for adults began in 2006 and was informed by input from stakeholders participating in an External Working Group and small-scale cognitive and usability testing (4,5). A Beta version released in August 2009 has been used by over 175 researchers to collect over 40,000 recalls; Version 1, which offers improved usability and new features, was released in September 2011 (8). A modified version intended for self-administration by children is under development by researchers at the Baylor College of Medicine (Houston, TX) and is expected to be available mid-2012 (9,10). This paper describes the features of ASA24 and planned evaluations.

ASA24 System

ASA24 is composed of two web-based applications, the Respondent and Researcher Websites. The Respondent Website is used by participants to complete recalls. The Researcher Website is used by researchers, clinicians, or educators to register, configure, and monitor studies. The Researcher Website also provides access to nutrient and food group analyses. Both sites require high-speed internet connections and standard computer monitors (not including netbooks or mobile phones) and are compatible with common internet browsers. Figure 1 presents the major functionality of, and interaction between, the Respondent and Researcher Websites.

Respondent Website

The ASA24 Respondent Website guides the participant through the completion of a 24HDR for the previous day, from midnight to midnight, using a dynamic user interface. The Version 1 Respondent Website flows as per a modified AMPM 24HDR (Table 1), includes an animated guide (a penguin character/avatar) and audio and visual cues to instruct participants, with options to turn off the guide or the audio; asks respondents to report eating occasions and time of consumption; includes optional modules to query where meals were eaten, whether meals were eaten alone or with others, and television and computer use

during meals; allows respondents to report foods and drinks by browsing a food category or searching from a list of food and drink terms derived from the 2007-08 National Health and Nutrition Examination Survey (11); allows the respondent to add or modify food and drink choices at multiple points during the session; asks detailed questions about food preparation, portion size, and additions so that food codes from the Food and Nutrient Database for Dietary Surveys version 4.1 (7) can be assigned; uses images taken at the Children's Nutrition Research Center of Baylor College of Medicine (Houston, TX) to assist respondents in reporting portion size; includes an optional module to query dietary supplement intake based on supplements reported in the 2007-08 National Health and Nutrition Examination Survey (12); is available in English and Spanish; and is accessible by individuals with disabilities. The Respondent Website does not provide feedback to respondents. Researchers obtain analysis files through the Researcher Website, and may contact respondents to communicate findings.

Researcher Website

The Researcher Website allows researchers, clinicians, and educators to register to use ASA24, manage the logistics of data collection, and obtain analysis files. Users can obtain a variety of reports, including statistics for complete, incomplete, and upcoming recalls for each participant. Upon request, the website produces data files with individual-level nutrients and food group estimates based on the Food and Nutrient Database for Dietary Surveys version 4.1 (7), the corresponding MyPyramid Equivalents Database from USDA (13), and the 2007-08 National Health and Nutrition Examination Survey Dietary Supplement Database (12).

Evaluation

ASA24 is based upon the USDA Automated Multiple-Pass Method (AMPM), which has been validated and shown to accurately estimate mean total energy and protein intakes compared to recovery biomarkers (1,3). Preliminary examination of output from recalls completed using ASA24 suggests acceptable face validity (i.e., energy, nutrient, and food group estimates that are consistent with data from the National Health and Nutrition Examination Survey). To formally evaluate the impact of the change in mode of administration from the interviewer-administered AMPM 24-hour recall to a self-administered web-based recall, two studies will be conducted in 2012 using Version 1 of ASA24. In a study of 1000 healthy adults, 20-70 years of age, drawn from a variety of geographic regions, nutrient and food group estimates from ASA24 will be compared to those from standardized AMPM interviewer-administered recalls. In a second study, 80 adults, 20-70 years of age, will be randomly assigned to complete an ASA24 or AMPM recall one day after consuming foods of known amounts; each method will be validated against true intakes.

Conclusions

Adaptation of the interviewer-administered 24HDR to a fully-automated tool has the potential to revolutionize dietary assessment by enhancing the feasibility and cost-effectiveness of collection of high-quality dietary data. ASA24 is now freely available for use by researchers, clinicians and educators and is in use in numerous studies in the US. Future experience and evaluation will reveal its most appropriate uses. Additional information regarding ASA24 can be found on its website (8).

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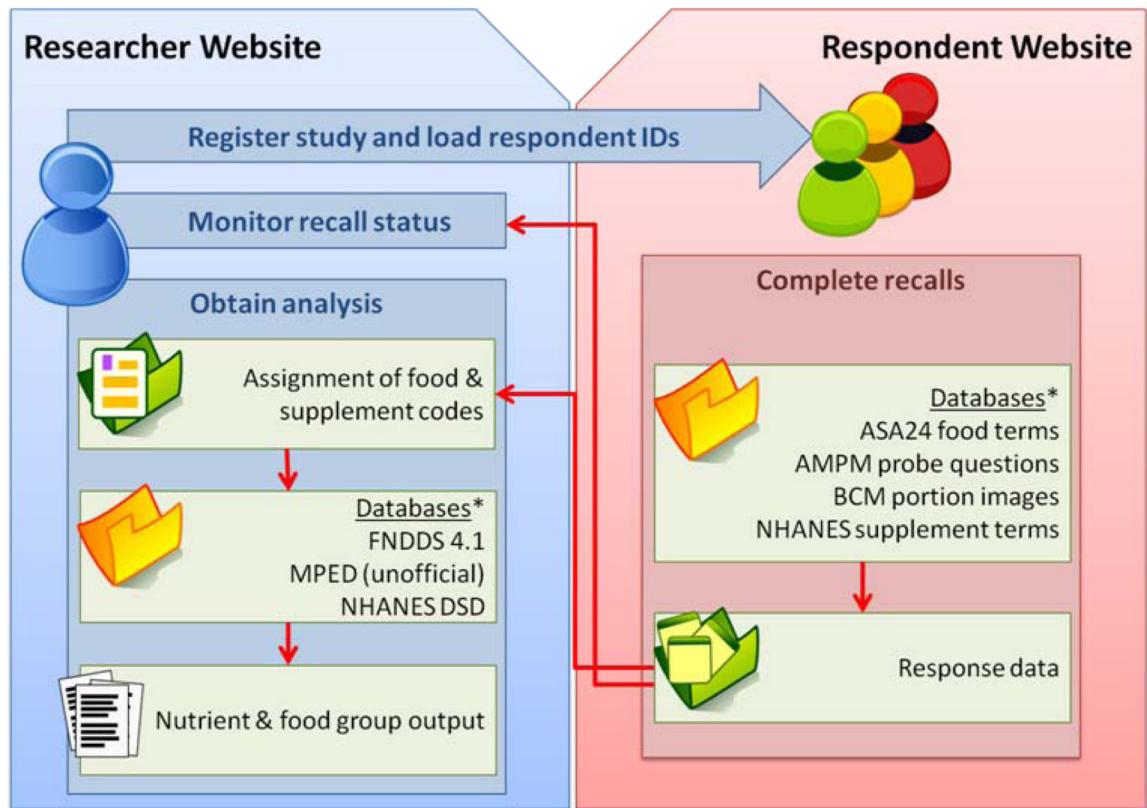


Figure 1. Functionality and interactions between the researcher and respondent websites of the ASA24 System

*Abbreviations: AMPM, Automated Multiple Pass Method; BCM, Baylor College of Medicine; DSD, Dietary Supplement Database; FNDDS, Food and Nutrient Database for Dietary Surveys; MPED, MyPyramid Equivalents Database; NHANES, National Health and Nutrition Examination Survey

Table 1
Order and content of passes within the ASA24 diet interview

ASA24 passes	Description of information collected
Meal-based Quick List	Respondents are asked to report meal name, time, and optionally: location, TV/computer use, who one ate with. Foods and drinks consumed are reported without details by browsing or searching.
Meal Gap Review	Respondents are asked if they consumed anything during any 3-hour gaps between eating occasions, between midnight and the first eating occasion, and between the last eating occasion and midnight. "Yes" responses return the respondent to the Quick List to add foods or drinks.
Details	Respondents are asked for details about the foods and drinks they recorded during the Quick List, including form, preparation methods, the amount eaten, and any additions.
Forgotten Foods	Respondent are asked about the consumption of commonly forgotten foods and drinks and report them as necessary by returning to the Quick List.
Final Review	Respondents are prompted to review all of the foods and drinks reported for the intake day; they can make edits and add meals and foods and drinks as desired.
Last Chance	Respondents are given another opportunity to add foods or drinks.
Usual intake	Respondents are asked: "Was the amount of food that you ate yesterday more than usual, usual, or less than usual?"
Supplement Module (optional)	Respondents are asked to provide information about the types and doses of supplements consumed by completing quick list, detail and final review passes.