FINAL EMA/EMI Assigning Rules

1. Random EMA (<=3 per day)
   - **Triggering Type**: System Triggered
   - **Number of Random EMA**: Maximum 1 in each of 3 four-hour windows.
   - **Conditions:**
     [1] Time to last random EMA (in the previous window) > 60 Min.
     [2] Time to last event contingent EMA > 10 Min.
     [3] Time to last EMI > 10 Min.
     [4] Others conditions: data quality in last 5 Min. is ''good"; not driving; phone battery level > 10%; not currently being physically active, e.g. walking or moving
   - **Assigning Rule:**
     - ➢ At the beginning of each time window, generate an anchor time chosen uniformly at random over the next 2 hours
     - ➢ When the anchor time arrives, check the conditions [1-4].
       - o If conditions are all satisfied, send the EMA.
       - o If not, generate a new anchor time chosen uniformly over the ½ remaining time in the current time window, e.g. [last anchor time, last anchor time + ½ remaining time].
     - ➢ When the new anchor time arrives, check the conditions [1-4].
       - o If conditions are all satisfied, send the EMA.
       - o If not, then for the remaining time of the current time window, send the EMA as soon as the conditions [1-3] are satisfied.

2. Event Contingent EMA (<= 3 per day)
   - **Triggering Type**: Only self-initiated (by reporting "I have smoked"). The Signal triggered EMA (detecting cigarette usage via sensors and triggering EMA) is being developed.
   - **Number of Event contingent EMA**: Maximum 1 in each of the 3 four-hour windows.
   - **Conditions**:
     [1] The Event contingent EMA has not been provided in the current time window
     [2] Time to last Event contingent EMA (in the previous window) > 30 Min
     [3] Time to last Random EMA > 10 Min.
     [4] Time to last EMI > 10 Min.
     [5] Others conditions: data quality in last 5 Min. is "good"; not driving; phone battery level > 10%; not currently being physically active, e.g. walking or moving
   - **Assigning Rule**:   Send the Event contingent EMA as soon as the conditions [1-5] are met and user reports "I have smoked".
     The rationale is that since we have many constraints (i.e. conditions [1-5]) on sending the event contingent EMA and we don't know if user is going to smoke again in the remaining part of the time window, we will simply deliver the EMA as soon as user reports smoking and conditions [1-5] are satisfied.

3. End-of-Day EMA (1 per day)
   - **Triggering Type**: System Initiated or self-initiated.
   - **Number of Event contingent EMA**: 1 per day

- **Assigning Rule**: Send out the End-of-Day EMA at end of last 4-hour window (allow user to postpone for 15 min or 30 min or 1 hour or 2 hours). During the last 4-hour window of day, and after this last window, provide a button that the user can press to self-initiate the end-of-day EMA.

4. EMI (Average of 3 per day)
- **Triggering Type**: System Triggered
- **Number of EMIs per day**: Starts on Quit date.
  (1) Pre-lapse: average of 3 EMIs per day with average of 1.5 EMIs in both "Stressed" and "Not Stressed" episode.
  (2) Post-lapse: average of 2.5 EMIs per day with average of 1 EMIs in "Stressed" and average 1.5 in "Not stressed" episode;

- **Note**: The algorithm for classifying stress is based on increase/decrease trend of stress intensity measures to ensure high quality stress classifications. The stress classifications are performed at the "peak" of an episode (the "peak" is determined by MACD algorithm).
- **Assigning Rule:** At the "peak" of each episode,
  - Check if the following conditions are all satisfied
    [1] If stress classification of this episode is either "Stressed" or "Not Stressed", that is, not in "Unknown".
    [2] Time to last EMI > 60 Min.
    [3] Time to last random EMA in previous or current window> 10 Min.
    [4] Time to last event contingent EMA > 10 Min.
    [5] Others conditions: data quality in last 5 min is "good"; privacy; not driving; phone battery level > 10%; not currently being physically active, e.g. walking or moving, and
  - If conditions [1-5] are satisfied update the randomization probabilities: At the beginning of the day, the randomization probabilities for "Stressed" and "Not stressed" are initialized by using the Minnesota dataset based on if the user is in pre-lapse or post-lapse period; these randomization probabilities are updated based on user's own stress episodes during current day each time a stress or non-stress episode is detected. The timestamp of lapse is determined by the self-report of the user; that is, the randomization algorithm switches to "post-lapse" version right after the user reports smoking after quit day.
  - Randomize according to the stress classification and the updated probability.