



## Checklist for Minimizing Cognitive Load through Design

### Intrinsic Load

#### 1 Be Simple

- Only the information and controls needed for task performance are displayed on each screen.
- Abbreviations or symbols are avoided.
- Iterative inspection techniques, such as design reviews or heuristic evaluations, have been conducted to confirm: (a) minimalist design; (b) clear text and icons; (c) obvious alert states.

#### 2 Be Helpful

- Step-by-step guidance has been provided for all important workflows and tasks.
- The level of guidance provided is appropriate for the level of user performing the task.
- Attention has been given to preventing likely errors—e.g., hard stops to prevent omissions; prompts to confirm critical information.
- One or more cognitive walkthroughs have been conducted to ensure that the product design (a) guides users through key workflows and tasks; (b) prevents common errors.

### Extrinsic Load

#### 3 Be Smart

- Users are not asked to remember information from screen to screen as they work. The product stores key information for the user and presents it when needed during task performance.
- Numerical calculations are performed for users at appropriate times during task performance.
- Recommendations are provided to users when appropriate. Reasoning behind recommendations is provided and users are allowed to override recommendations if desired.
- User needs are anticipated and the right tools are provided at the right time.
- Alert conditions are recognized and communicated clearly to the user.
- Warnings and alert conditions decrease their intensity (e.g., lower volume) once acknowledged.
- Critical alert states (e.g., pulse <40; blocked IV line; out of bed alarm) re-alarm after delay until remedied.

## 4 Be Calm

- A soothing, neutral color palette is used.
- Attention has been given to decrease information density and increase white space for improved information processing.
- Animation is used only when (a) it improves understanding, (b) the user's attention is needed, or (c) it provides a deeper understanding of status. Animation is not used gratuitously.
- Audio is used only when (a) it improves understanding, (b) the user's attention is needed, or (c) it provides a deeper understanding of status. Audio is not used gratuitously.
- Attention has been given to ensure this product does not contribute to the problem of "alarm fatigue." Appropriate levels of audio are sounded during alarm states.

## Germane Load

### 5 Be Consistent

- A design walkthrough has been conducted to ensure consistency regarding the use of icons, color, controls, terminology, and workflows.
  - within-product
  - within-brand
- Research has been conducted to identify and follow industry standards and regulations in regards to the use of icons, color, controls, terminology, and workflows.
- Cognitive modeling research such as a card sort study has been conducted to understand users' mental model(s) of the product content, and this understanding was used to inform the product's design and organization.

### 6 Be a Team Player

- Field research has been conducted to understand the products used in conjunction with ours and to observe how well our product fits into the global healthcare technology system.
- Steps have been taken to ensure our product blends seamlessly with the work environment, rather than introduces new barriers to overcome.

## Usability Evaluation

Iterative, simulated-use usability testing has been conducted with a realistic level of environmental distraction (e.g., noise, interruptions) and cognitive load (e.g., simultaneous processing) to check:

- Comprehension of status
- Comprehension of abbreviations, symbols and icons
- Important and frequent workflows performed by (a) experienced, (b) new and (c) intermittent users who need different levels of guidance
- Alert recognition, mitigation, and dismissal
- Appropriateness and accuracy of recommendations and built-in assistance
- Product usability when used in conjunction with other commonly-used devices
- Product learnability when experienced alongside other brands or past versions