ChatGPT

PA-Trace UI Design Strategy

Text Highlighting & Attention Management

Use **color-coded highlights** for each evidence category, since color is a highly effective pre-attentive cue. For example, assign one distinct pastel background per category (e.g. teal for symptoms, orange for treatments) because our visual system "can use this [color] element … to distinguish items and extract information immediately" [1]. Avoid using underlines for highlighting (they imply links) or dense bolding alone; color backgrounds draw the eye without requiring effort. However, **limit the total highlighted text**. Nielsen Norman advises using bold/highlight *sparingly* (no more than ~30% of the text) so that only the most important points stand out [2]. If too much text is colored, "nothing stands out" and scanning slows [2].

Give each category a consistent style (color, maybe a colored underline or border) so users learn the coding quickly. Ideally use 3–4 distinct colors at most, per EHR design guidelines [3]. Overlapping highlights should be avoided if possible – Prodigy notes that "visualizing multiple nested overlapping spans" is confusing [4]. If two categories truly overlap, consider either merging them into a single combined highlight or breaking the text into two layers the user can toggle. One practical solution is **toggles/filters per category** (see Section 4) so the user can hide one category to reveal another without visual clutter. In general, use **white space and text structure** to break up dense paragraphs: keep lines ~50–75 characters long (roughly 10–15 words) [5], and break text into short paragraphs or bullets when possible. As one UX guide notes, only 1–2 highlighting effects should be used: "if everything is highlighted, nothing stands out" [6]. In sum, apply color and emphasis *selectively* to guide attention, but keep the overall page clean and uncluttered.

Trust & Explainability (XAI) UI Patterns

Explicitly **link each structured fact to its source text**. A proven pattern is **brushing-and-linking**: when the reviewer hovers over or selects a fact (on the right), simultaneously highlight the corresponding span in the note (on the left), and vice versa [7]. This coordinated highlighting (often called *linked highlighting* in data visualization) makes provenance clear at a glance. For example, clicking the "Duration: 8 weeks" row could auto-scroll and flash-highlight the phrase "for 8 weeks" in the note. Connector lines or faint background bands can also visually tie the table row to the text segment. In all cases, preserve context – e.g. show an excerpt or tooltip with the full sentence when a highlight is selected, so the nurse can read the evidence in situ.

Show **where evidence is *missing*** in a calm way. If a policy criterion is not met by the note (a "negative finding"), present it in the interface as a *flag* or dashed-row rather than a bright red alert. For instance, include a row in the facts table labeled "Conservative Care: *no mention of dedicated therapy period*" with a neutral-yellow warning icon. EHR design guidelines note that red should be reserved for truly critical data, yellow for caution, and green for normal [8]. By using a moderate highlight (e.g. yellow or gray) for absent evidence, you acknowledge it ("missing conservative care found") without triggering alarm. Keep such

missing-evidence cues subtle – use icons or light background and an “info” label – because overusing red/orange leads to alarm fatigue [8] [3].

Promote **human-in-the-loop verification** at every step. Do not let the AI output look “final”; instead invite review. For example, add a small “✓/✗” or thumbs-up/down button next to each fact so the reviewer can quickly mark it as correct or incorrect. This explicit feedback loop (“Did I get this right?”) gives users agency and aligns with XAI principles: Eleken recommends a “transparent AI interface” include mutual verification, e.g. a simple user confirmation step, so people can “tweak the result and see how the AI adjusts” [9]. You could also show an “Adjust evidence” button that lets the nurse manually highlight a span if the AI missed it. In general, the UI should present the AI’s findings as *suggestions*, not edicts: e.g. captions like “AI-identified evidence (subject to review)” and confidence indicators. PAIR’s Guide on trust stresses that users must *calibrate* their trust: they shouldn’t trust blindly but should know when to apply judgment based on the AI’s explanations [10]. Thus, ensure every highlighted fact has a clear explanation (the text span), and consider a brief tooltip or icon stating source or confidence. Altogether, the interface should read like a conversation: it shows **why** the AI picked each fact (exact quote), and it invites the human to accept or correct it.

Medical Dashboard Aesthetics

Adopt a **clean, modern healthcare palette**. Industry examples and design best practices suggest a base of white or very light gray (for cleanliness/purity) with accents in calming blues or teals (for trust and serenity) [11] [12]. For instance, Google Health and many EHRs use white backgrounds with blue/teal highlights and icons. Blue conveys “trust, calm, safety” [11], while green (another common accent) signals health and well-being [13]. Reserve bold colors only for emphasis: e.g. use a vibrant red sparingly for errors or truly urgent alerts [14]. An EHR guideline reinforces this semantic: red = danger/critical, yellow = caution, green = normal operation [8]. In practice, this means: use neutral text fields and UI panels (white or pale gray), color-code highlights as above, and show any warning status with an orange/yellow icon or banner (never alarm-blaring red for mere missing evidence). Keep the overall contrast high (dark text on light background) for readability [15] [16], and avoid busy background patterns.

Choose **legible, professional typography**. Sans-serif fonts are standard in healthcare UIs because they’re clean and easy to read [17]; examples include Arial, Helvetica, Verdana or Roboto. Use a comfortable base size (around 16px or larger on desktop) and allow for text scaling. NNG advises using “a reasonably large default font size” and “high contrast between characters and background” [18]. Also ensure characters are easily distinguishable (EHR guidelines specifically say the font must make I vs 1 vs l, O vs 0, etc. unmistakable [19]).

Set line-height (leading) generous for dense text – about **1.3–1.5×** the font size. Studies recommend ~150% line spacing for readability [20]. UX guidelines note that longer lines benefit from even more spacing, but as a rule of thumb 1.5× is good. Avoid very narrow columns of text, but also don’t stretch lines beyond ~75 characters [20]. In a fixed-width layout, aim for ~50–70 characters/line; on mobile, keep lines shorter and font at least 14px. In sum, use large, legible text with ample line spacing so that the reviewer can scan long clinical notes without eye strain [20] [18]. Bold or semi-bold can be used for headers and key labels; otherwise keep body text simple (no italics or decorative caps).

Human-Centered Feature Ideas

1. **Category Filter Toggles.** Add checkboxes or toggle buttons (“Symptoms”, “Treatment”, “Red Flags”, etc.) that let the user show/hide each category of highlights in the note. This is an easy static-HTML enhancement (just CSS/JS) that cuts clutter. It implements the progressive disclosure principle: users “control the complexity” by revealing only the information they need [21]. In practice, hiding the other categories makes overlapping or dense highlights vanish, so the nurse can focus on one type of evidence at a time. The toggles themselves should be clearly labeled with color swatches (matching the highlight colors) so it’s obvious what’s on/off.

2. **Linked Highlighting on Hover/Click.** Make the fact-text linkage interactive. When the user hovers over a fact in the table (or over a highlighted span in the text), automatically highlight the matching part of the other view. For example, moving the mouse on “Conservative Care: 6 weeks” could shade “6 weeks of PT” in the note. Likewise, clicking a highlighted phrase could scroll the table to the corresponding row. This “brushing-and-linking” approach [7] ensures the source and fact stay connected. A subtle animation (e.g. a brief fade-in highlight) can draw attention without being jarring. This direct manipulation makes traceability obvious and gives the user immediate visual confirmation of provenance.

3. **Interactive Verification Icons.** Next to each extracted fact, display a small “✔/✖” or thumbs-up/down icon for the reviewer to tap. When clicked, the icon toggles state (e.g. graying out or striking through the fact) to indicate agreement or disagreement. This low-key UI lets the nurse *participate* in the AI’s decision loop. For instance, if the AI mis-extracted a treatment, the nurse can mark it wrong (and even correct it by highlighting the right text). Eleken’s XAI patterns recommend exactly this kind of mutual verification (“Did I get that right?”) to build trust [9]. Implementing it with simple JS (e.g. toggling CSS classes) is quick but signals “human-centered AI.” As a bonus, a summary line could count how many facts were confirmed vs. flagged, reminding the user that the AI’s output is provisional.

Each of these features is straightforward to code in static HTML/JS but visibly reinforces human control and clarity – a strong “wow” factor for a human-centered AI demo. For example, toggles and linked highlights immediately show users they’re in charge of the view, and verification icons explicitly invite their judgment. Combined with the design principles above, these elements will make PA-Trace’s interface clear, trustworthy, and ergonomically friendly for clinical reviewers.

Sources: Best practices are drawn from UX and health-IT design literature. Highlights should leverage pre-attentive color cues [1], with sparing use [2] to avoid overload [6]. Brushing-and-linking is a standard interactive viz pattern [7]. Paired color semantics (red=danger, green=ok) come from human-factors guidelines [8]. And design authorities (e.g. Nielsen Norman, Google PAIR, IxDF) emphasize clarity, contrast, and user feedback in AI UIs [2] [10] [9], all of which we’ve applied above.

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