

Version-to-Evidence Traceability in Prescription Digital Therapeutics: A Cross-Sectional Study of Audited Public Regulatory Records

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Abstract

Background

Clinical evidence for a prescription digital therapeutic concerns a particular implementation, whereas product names can persist across software changes. This study examined whether public regulatory documents explicitly link identified therapeutic software releases to supporting clinical evidence.

Methods

An exploratory cross-sectional audit study examined prescription software therapeutics within nine Food and Drug Administration (FDA) product codes derived from a published inventory. All eligible records in the nine product-code queries were included without an authorization-date restriction. The primary outcome was an explicit association between a designated therapeutic software release and clinical evidence in an FDA-posted authorization packet. Product names, study codes, protocol revisions, and operating-system versions were excluded as release identifiers. Clinical-program identification, software-assurance statements, and narrative explanations of implementation continuity were recorded separately.

Results

Seventeen authorization packets comprising 245 pages represented 15 product families. Every family had identifiable clinical evidence and a statement concerning software documentation or testing. One family (1/15, 6.7%) and one packet (1/17, 5.9%) contained a qualifying release-level link. The later EndeavorRx (Akili Interactive Labs, Inc., Boston, Massachusetts, USA) packet identified v3.0 in both the subject-device and clinical-study tables. Release consistency was not assessable for the other 14 families from the audited packets. Several records nevertheless documented aliases, renaming, content comparisons, or browser-to-mobile transitions. An illustrative trial-protocol check located a therapeutic revision outside the regulatory corpus, demonstrating the limits of packet-only ascertainment.

Conclusions

In this product-code-based sample, public FDA documents generally identified clinical programs but seldom identified the therapeutic release associated with that evidence. This finding concerns public reporting specificity and does not establish inadequate validation or regulatory noncompliance. A concise public association among release identifiers, clinical studies, and documented changes could improve the interpretability of digital-treatment evidence.

Categories: Therapeutics, Health Policy, Healthcare Technology

Keywords: digital medicine, evidence traceability, prescription digital therapeutics, regulatory transparency, reproducibility, software validation, software versioning

Introduction

The clinical meaning of a software treatment depends on what the software delivers [1]. Therapeutic content, decision rules, interaction design, and the sequence of treatment activities can change while the product retains its name. A clinical report therefore needs enough implementation detail to identify the intervention evaluated [2,3]. An established reporting guideline for digital intervention trials recommends identifying the date or version of an evaluated digital intervention and describing important changes during evaluation [4]. Applying that principle to a prescription product creates a practical question: can an outside reader determine which identified software release is associated with the clinical evidence cited for the authorized device?

Regulatory review addresses software configuration in substantially more detail than a product name. U.S.

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Food and Drug Administration (FDA) guidance on premarket software documentation recommends a history of tested software versions, a final release entry, and an assessment of differences between tested and released software [5]. Separate guidance provides a framework for determining when software changes warrant a new 510(k) submission [6]. These recommendations concern the information needed for regulatory assessment. They do not imply that every element of a submission is reproduced in the public authorization record.

The public record nevertheless serves an important interpretive function. Clinicians, evidence reviewers, and formulary decision-makers can consult it to identify the intervention, its indication, and its clinical support. A prior study characterized regulatory pathways and labeling across prescription digital therapeutics [7]. The present study addresses a different attribute: whether the public documentation associates a designated therapeutic software release with the evidence supporting the product. The analysis does not rank efficacy, compare treatment effects, or score the quality of individual companies.

The objective was to measure explicit release-level clinical linkage within a reproducibly defined FDA document corpus, while separately describing other information that supports intervention identification. The distinction matters because a detailed narrative explanation of a software transition may be scientifically useful without naming a release, and an absent public identifier does not establish an absent regulatory assessment.

Materials And Methods

Study design and eligibility

This study was an exploratory cross-sectional audit of public regulatory documents. Nine FDA product codes represented in a previously published inventory were selected as the search frame: PWE, QVO, QFT, QMY, QWI, QXC, SAP, SCP, and SEE [7]. Eligible records concerned prescription-only, software-delivered therapeutic devices operating on general-purpose computing platforms, without an authorization-date restriction. Membership in the earlier inventory was not required. Different authorizations of the same named product were grouped into a product family. Distinct nonprescription products were excluded, even when technologically related to an included product.

Eligibility criteria and outcomes were prespecified. All eligible products within the nine selected codes were considered, irrespective of authorization date or inclusion in the earlier inventory. The results describe the selected product codes in the saved database snapshot rather than an FDA-wide census.

Record retrieval and corpus definition

The openFDA device/510k application programming interface (API) was queried separately for each code on September 24, 2026 [8]. Queries used the `product_code` field and a limit of 1,000 records, without an authorization-date restriction. The endpoint returned records for both 510(k) and De Novo authorizations in these codes. Response totals were compared with returned-record counts, and all nine responses were complete. The database snapshot identified its last update as September 21, 2026. Prescription-status and other eligibility criteria were then applied, and the individual FDA database entries were used to verify authorization identities and dates.

For each retained De Novo authorization, the linked public decision summary was the analytic packet. For each retained 510(k), the linked FDA portable document format (PDF) file containing the decision correspondence, indication form, and sponsor summary was the packet. A packet could therefore contain several documents. Administrative correspondence already included in a PDF remained within that packet; it did not create an additional authorization. Separate classification orders or database pages used to verify metadata were not counted as analytic pages. All linked analytic PDFs were obtained.

Outcomes and coding rules

The primary outcome was the presence of an explicit public association between an identified therapeutic software release and supporting clinical evidence. A qualifying packet identified the therapeutic release in both the subject-device description and clinical-evidence description, or explicitly mapped identified studied and authorized releases. Numeric, alphanumeric, or dated release identifiers could qualify when the source assigned them that meaning. The criterion did not require an executable hash and did not establish identity of every software build, server component, or participant exposure.

A family was positive if at least one retained packet contained a qualifying association. This was a presence measure, not a completeness assessment across all studies, indications, or later releases. When the information needed to compare studied and authorized releases was unavailable, release consistency was classified as not assessable from the corpus. It was not classified as inconsistent. Product names, development codes, FDA submission numbers, protocol or statistical analysis plan revisions, document dates, operating-system requirements, measurement-instrument versions, and page numbers were not treated as therapeutic release identifiers unless explicitly designated as such.

Two contextual observations were recorded for each family: whether a clinical study or same-family clinical lineage could be identified, and whether a packet described software documentation supplied or reviewed, or software testing. The latter was a software-assurance reporting measure; it did not independently confirm that every verification or validation activity had been performed. Narrative statements concerning aliases, renaming, delivery-platform changes, preserved content, or change assessment were extracted descriptively. Substantial equivalence to another product was not treated as evidence of a software predecessor relationship unless that relationship was explicitly documented. The operational distinctions are summarized in Table 1.

Observation	Qualifying information	Interpretive limit
Clinical-program identification	A clinical study or same-family predecessor clinical program can be identified	Does not require a new clinical trial for each authorization
Software-assurance statement	The packet reports supplied or reviewed software documentation, or software testing	Does not independently verify completion or adequacy of all testing
Therapeutic release identifier	The source explicitly designates a numeric, alphanumeric, or dated therapeutic software release	A brand, development code, protocol revision, or operating-system version is insufficient by itself
Release-level clinical linkage	A designated release appears in both device and clinical descriptions, or identified studied and authorized releases are explicitly mapped	Presence of one association does not establish executable identity or a complete product history
Narrative continuity	The source explains an alias, renaming, delivery change, preserved content, or change assessment	May support interpretation without satisfying the release-identifier criterion

TABLE 1: Operational definitions used in the document audit

A family was positive for release-level linkage if any retained packet qualified. The 14 families without a qualifying link lacked sufficient release-identifying information to assess release consistency from the audited packets

Extraction and analysis

The author personally performed all record retrieval, document review, data extraction, development and application of the reporting definitions, source reconciliation, classification, and analysis. The PDFs were text-extracted and examined in context, including their device descriptions, clinical sections, comparison tables, software sections, and footnotes. Searches for version, revision, release, build, software, equivalent, and related terms supported retrieval within each document. The author interpreted search results in context rather than using them as an automatic classifier. Missing or corrupted text prompted targeted page rendering and optical character recognition.

The author consolidated the extracted information and checked substantive classifications against the underlying source documents. The retained dataset identifies the exact packet and source location for each substantive classification. This was a single-reviewer audit; no blinded duplicate extraction or inter-rater reliability assessment was performed.

The author calculated counts and percentages using Microsoft Excel. Product families were the primary denominator; authorization packets were reported separately. Percentages were rounded to one decimal using round-half-up. No confidence intervals or hypothesis tests were calculated because the study describes a bounded, code-defined sample with clustered records and an investigator-defined reporting measure. An additional descriptive subset retained only the earliest authorization for each family to assess whether inclusion of subsequent packets affected the observed count.

The author selected one publicly available trial protocol for presentation as an illustrative supplemental source check after identifying a distinction between investigational naming and software revisions [9]. This was not a uniform protocol search across products and did not alter the regulatory-corpus numerator or denominator. Neither confidential submissions nor installed applications, executable binaries, source code, or current commercial deployments were audited.

Ethics and data availability

The study used publicly available, product-level regulatory and research documents. It involved no participant recruitment, interaction with individuals, identifiable private information, human tissue, or animal subjects. No institutional ethics approval or exemption determination is claimed.

Results
Study corpus

The nine product-code queries returned 18 records. One record concerned a nonprescription product. The final corpus contained 17 authorization packets representing 15 product families and 245 PDF pages. There were six De Novo summaries, 10 traditional 510(k) packets, and one special 510(k) packet. Included decisions ranged from September 14, 2017, to July 30, 2026. Two families had two retained authorizations; the remaining families had one. Table 2 identifies every family, its manufacturer at authorization, and all retained authorizations [10-26].

Product family and manufacturer at authorization	Authorization, decision date, and source
reSET (Pear Therapeutics, Inc., Boston, Massachusetts, USA)	DEN160018; September 14, 2017 [10]
reSET-O (Pear Therapeutics, Inc., Boston, Massachusetts, USA)	K173681; December 10, 2018 [11]
Somryst (Pear Therapeutics, Inc., San Francisco, California, USA)	K191716; March 23, 2020 [12]
EndeavorRx (Akili Interactive Labs, Inc., Boston, Massachusetts, USA)	DEN200026; June 15, 2020 [13] K231337; December 13, 2023 [14]
Parallel (Mahana Therapeutics, Inc., San Francisco, California, USA)	DEN200029; November 25, 2020 [15] K211372; June 2, 2021 [16]
Regulora (metaMe Health, Inc., Chicago, Illinois, USA)	K211463; November 24, 2021 [17]
Stanza (Swing Therapeutics, Inc., San Francisco, California, USA)	DEN220083; May 9, 2023 [18]
AspyreRx (Better Therapeutics, San Francisco, California, USA)	DEN220058; July 7, 2023 [19]
Rejoyn (Otsuka America Pharmaceutical, Inc., Rockville, Maryland, USA)	K231209; March 30, 2024 [20]
MamaLift Plus (Curio Digital Therapeutics, Inc., Princeton, New Jersey, USA)	K223515; April 22, 2024 [21]
SleepioRx (Big Health, Inc., San Francisco, California, USA)	K233577; August 5, 2024 [22]
DaylightRx (Big Health, Inc., San Francisco, California, USA)	K233872; August 30, 2024 [23]
CT-132 (Click Therapeutics, Inc., New York, New York, USA)	DEN240064; April 11, 2025 [24]
Prismira (Lumos Labs Medical, a division of Lumos Labs, Inc., San Francisco, California, USA)	K243729; June 13, 2025 [25]
Motivista (CT-155; Click Therapeutics, Inc., New York, New York, USA)	K254038; July 30, 2026 [26]

TABLE 2: Product families and included FDA authorizations

FDA: Food and Drug Administration
Manufacturer locations reflect the historical packets, not current ownership or availability. AspyreRx is identified as BT-001, SleepioRx as Sleepio, and DaylightRx as Daylight in the corresponding packets. Parallel includes the web and mobile authorizations. Dates are FDA decisions, not dates of later administrative correspondence

Clinical-program identification and release-level linkage
Clinical evidence was identifiable for every product family (15/15, 100.0%), either directly in a packet or through a linked predecessor authorization within the same family. All families also had a public statement concerning supplied or reviewed software documentation, or software testing. These observations concern what the records reported and do not independently establish clinical effectiveness or reproduce the underlying tests.
Explicit release-level clinical linkage was observed for one of 15 families (6.7%) and one of 17 packets (5.9%). In the later EndeavorRx (Akili Interactive Labs, Inc., Boston, Massachusetts, USA) packet, the subject-device table identifies v3.0, and a clinical-study comparison table assigns that same release label to

the adolescent study (PDF pages 7 and 11). The summary also describes changes in accessibility, engagement, and platform compatibility while stating that the core therapeutic technology remained unchanged [14]. This is a release-label association; the packet does not establish a participant-level inventory of exact executable builds.

The other 14 families (93.3%) lacked sufficient therapeutic release identifiers in the audited packets to assess consistency between studied and authorized releases. Thus, identifier availability and the release-linkage result were dependent observations rather than separate demonstrations of different deficiencies. In the earliest-authorization subset, none of 15 packets contained a qualifying link; the primary analysis's positive observation arose from the later EndeavorRx authorization [13,14]. Table 3 summarizes the findings.

Observation	Unit	Count	Percentage
Identifiable clinical study or same-family clinical lineage	Product family	15/15	100.0%
Software documentation or testing statement	Product family	15/15	100.0%
At least one explicit release-level clinical link	Product family	1/15	6.7%
Release consistency not assessable from audited packets	Product family	14/15	93.3%
Explicit release-level clinical link	Authorization packet	1/17	5.9%
Explicit release-level link in earliest-authorization subset	Earliest packet per family	0/15	0.0%

TABLE 3: Publicly observable clinical and software reporting

The product-family and packet estimates describe the same underlying positive observation in EndeavorRx K231337. The earliest-authorization subset is a separate descriptive analysis. Percentages use one decimal and round-half-up; not assessable does not mean inconsistent or unvalidated. Values are descriptive counts and percentages; no inferential statistical tests were performed, so p-values and test statistics are not applicable

Narrative continuity without release identifiers

Several packets supplied informative explanations of intervention continuity despite not identifying a therapeutic release. The reSET (Pear Therapeutics, Inc., Boston, Massachusetts, USA) decision summary describes a side-by-side comparison of desktop and mobile content and format [10]. The sponsor-authored Somryst (Pear Therapeutics, Inc., San Francisco, California, USA) summary describes the browser-delivered Sleep Healthy Using the Internet intervention as an equivalent to Somryst and identifies the supporting trials [12,27,28]. These are positive documentary explanations of continuity, although they do not provide a release-specific crosswalk.

The two Parallel (Mahana Therapeutics, Inc., San Francisco, California, USA) authorizations document a web-to-mobile transition. The original summary describes an eight-session web intervention and identifies the Assessing Cognitive Behavioral Therapy in Irritable Bowel study [15,29]. The mobile summary describes ten sessions, changes to the user interface, digitized homework, content order, and session breaks. It states that the core therapeutic skills remain unchanged and explains the reliance on design controls, software verification and validation, and usability testing without an additional clinical study [16]. The records therefore explain the basis for a change assessment even without naming the releases involved.

Stanza (Swing Therapeutics, Inc., San Francisco, California, USA) provides a different example: a footnote expressly states that the tested device was named Tempo and that the difference from the final device was its name. The same FDA summary reports that revision-level history and traceability documentation were submitted, without reproducing that history [18]. This distinguishes a publicly reported regulatory assessment from a publicly inspectable release history. Investigational-name aliases were also explicit in the original EndeavorRx and Rejoyn (Otsuka America Pharmaceutical, Inc., Rockville, Maryland, USA) packets [13,20].

Identifiers that did not establish a therapeutic release

Contextual reading prevented several false-positive classifications. The packets used CT-132 (Click Therapeutics, Inc., New York, New York, USA), BT-001 (Better Therapeutics, San Francisco, California, USA), CT-152 (Rejoyn, LLM-001 (Prismira; Lumos Labs Medical, a division of Lumos Labs, Inc., San Francisco, California, USA), and CT-155 (Motivista; Click Therapeutics, Inc., New York, New York, USA) as product or development identifiers, without designating these labels as software releases [19,20,24-26]. The CT-132 document's bridging study concerned an additional medication-defined population, not a software-version transition [24]. MamaLift Plus (Curio Digital Therapeutics, Inc., Princeton, New Jersey, USA) listed matrix

traceability among engineering tests but did not present a clinical release crosswalk [21]. Somryst's September 2023 administrative letter changed its product code and explicitly stated that the submission had not been re-reviewed; the underlying clearance remained dated March 23, 2020 [12].

Illustrative supplemental protocol check

The protocol for the pediatric attention-deficit/hyperactivity disorder trial registered as NCT02674633 identified an EVO game revision of 4.3C in its cover-page header, separately from protocol version 1.02 [9]. This shows that a therapeutic revision absent from an FDA summary may appear in another public source. The protocol identifies the planned intervention; it does not establish every participant's actual software exposure. No numerical equivalence or upgrade sequence between EVO 4.3C and the later v3.0 label was inferred.

Discussion

Principal interpretation

This audit found a difference between identifying a clinical program and identifying the software release associated with that program. Public regulatory packets for every included family identified clinical evidence and described software documentation or testing. Explicit release-level linkage was much less frequently observable. A missing qualifying link indicated insufficient public release identification; it did not, by itself, establish an unexplained or clinically consequential difference between studied and authorized implementations.

The narrative findings are central to that interpretation. A change may be explained through aliases, a name-only transition, a content comparison, or an assessment of platform modifications. Such information can materially assist interpretation even when it falls outside a release-identifier criterion. Conversely, a release label alone does not demonstrate that a clinical bridge is adequate. The present measure captures public reporting specificity and should not be used as an efficacy ranking or a proxy for overall software quality.

Public reporting and regulatory assessment

The findings are compatible with substantial information being available to regulators but absent from concise public summaries [30]. The 2023 FDA software guidance describes a version-history table extending through the intended released device, including an assessment of differences from tested software [5]. Stanza's review explicitly reports receipt of revision-level history [18]. Neither observation permits an inference that a missing public release identifier reflects a missing internal record. The source types also differ: FDA-authored De Novo summaries and sponsor-authored 510(k) summaries were written for related but distinct purposes.

A useful public record need not reproduce a confidential technical dossier. A short release-to-evidence association could identify the relevant clinical study, the evaluated release, the release or bounded configuration to which the evidence is applied, and the stated basis for carrying the evidence forward. This would address a clinical interpretation question while allowing detailed source code, security information, and proprietary engineering materials to remain outside that record. It would also distinguish documentation accessible to prescribers from the more extensive materials reviewed during authorization.

Software change assessment should remain proportionate to the change. FDA's software-change guidance does not treat every modification as requiring a new submission [6]. Likewise, this study does not support a requirement for a new randomized trial after every update. Parallel illustrates how an explanation of the changed implementation and its preserved therapeutic content can be made public [15,16]. The relevant question is whether the evidence carried forward is appropriate for the change and intended use, not whether every application update produces another trial [31,32].

Implications for evidence use

Release-specific reporting could improve how clinical findings are used after authorization. If an evidence review combines studies conducted with meaningfully different implementations, identifying the relevant releases would permit investigators to examine those differences rather than assume interchangeability from the brand name. A formulary review could distinguish a directly studied release from a successor supported by a documented change assessment. A subsequent effectiveness study could record the therapeutic configuration actually deployed. These are proposed applications of improved identification; the present audit did not test their effects on prescribing, reimbursement, or patient outcomes.

The unit needing identification may extend beyond the installed application. A software treatment can include client software, server functions, therapeutic content, and administrative components; these components are expressly described in the BT-001 review [19]. A mobile application's visible version may therefore be insufficient to identify the full therapeutic configuration. A public identifier could refer to a documented configuration encompassing the components relevant to treatment delivery, provided its

meaning and scope are stated. Establishing that approach would require agreement on what constitutes a clinically meaningful change.

Table 4 proposes a minimal public evidence record arising from these observations. It is a reporting proposal, not a validated scale or a finding that every field is legally required. The proposed record emphasizes identifiers, study links, and a concise change rationale. It does not award a composite score. Its usefulness would need to be evaluated through user testing, independent extraction, and comparison with the relevant underlying development records.

Field	Information to report	Purpose
Product and authorization	Product name, relevant authorization, indication, and population	Locate the regulatory and clinical context
Therapeutic configuration	Release identifier and the client, server, and content components it covers	Define what the identifier represents
Evaluated intervention	Clinical study identifier and the therapeutic release evaluated	Connect the implementation to the study
Evidence applicability	Authorized or successor release to which the evidence is applied	State the scope of the evidence association
Change assessment	Material changes, preserved therapeutic elements, and the stated supporting assessment	Explain the basis for carrying evidence forward
Record maintenance	Publication date, responsible organization, and a stable public location	Allow later readers to identify and retrieve the record

TABLE 4: Proposed fields for a concise public release-to-evidence record

This is a proposed reporting format derived from the audit, not a validated assessment tool or a statement that all fields are legally required

Study strengths and limitations

The study used explicit eligibility rules, retained all retrieved records in a screening log, and obtained every analytic packet linked to the included authorizations. Grouping related authorizations avoided treating the same product as multiple independent products. The supplemental protocol example also demonstrates why absence statements must remain tied to the source corpus examined.

Several limitations constrain interpretation. First, the nine codes were derived from a prior inventory rather than an unrestricted search of the FDA device database. Products assigned to other codes, newly created codes, or different historical classifications could be omitted. The included products therefore form a code-defined sample. Second, the sample is bounded to the nine-code database snapshot last updated on September 21, 2026. Authorizations absent from that saved snapshot were not sought through a new database search. Changes to classification, administrative letters, and corrected public PDFs can alter the accessible record.

Third, public packets differ in length and document type. Some products had multiple authorizations and therefore more opportunities to disclose a qualifying association. A positive family classification means that at least one association was observed; it does not imply a complete lineage across all clinical studies or commercial releases. The earliest-authorization subset demonstrates the sensitivity of this presence measure to packet selection. No temporal improvement, difference between regulatory pathways, or company-level effect can be inferred from the small descriptive counts.

Fourth, the endpoint is investigator-defined. Its stringent distinction between a designated release and a product name may not capture all information needed to judge a clinical bridge. A release label does not guarantee a unique executable, and absence of a label does not establish clinically important software change. Neither the clinical adequacy of each bridge nor the correctness of the manufacturers' technical assessments was independently tested. The study did not inspect confidential submissions, installation histories, current applications, source code, or a uniform set of trial protocols and commercial labels. The selected protocol check cannot estimate disclosure across all public sources.

Finally, no independent duplicate human review or reliability assessment was performed. Contextual checks and source locators reduce the difficulty of detecting errors but cannot establish freedom from them.

Independent human replication of the extraction would strengthen confidence in the findings.

Conclusions

Public regulatory records identified clinical evidence for all 15 product families, while providing less information about the therapeutic software release associated with that evidence. The appropriate interpretation of missing release detail is limited assessability from the public record. The audit does not establish that a product lacked validation, that its software changed in a clinically important way, or that its manufacturer failed to meet regulatory requirements. Documented renaming, content comparisons, and implementation-change explanations already provide useful forms of continuity. Adding a concise association among a defined therapeutic release, the supporting clinical study, and the rationale for subsequent changes could make those records more useful for clinicians and evidence reviewers. Future work should test the reproducibility and practical value of this reporting approach and examine its relationship to complete development and deployment records.

Additional Information

Author Contributions

All authors have reviewed the final version to be published and agreed to be accountable for all aspects of the work.

Concept and design: Shaheen E. Lakhan

Acquisition, analysis, or interpretation of data: Shaheen E. Lakhan

Drafting of the manuscript: Shaheen E. Lakhan

Critical review of the manuscript for important intellectual content: Shaheen E. Lakhan

Supervision: Shaheen E. Lakhan

Disclosures

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