



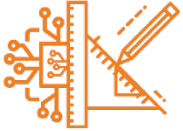
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An-Najah National University

كلية الهندسة | Faculty of Engineering

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An-Najah National University

Faculty of Engineering & Information Technology

Computer Engineering

NeuroLand

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Presented in partial fulfilment of the requirements for Bachelor degree in (Computer Engineering).



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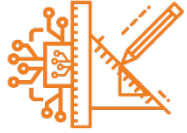
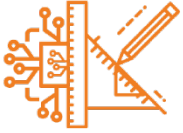


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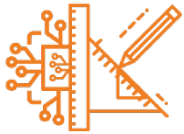


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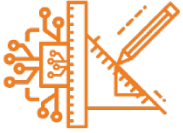


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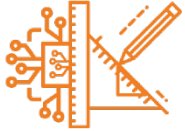
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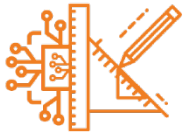
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List of Abbreviations

ADHD	Attention-Deficit/Hyperactivity Disorder
AI	Artificial Intelligence
API	Application Programming Interface
ARIA	Accessible Rich Internet Applications
CFR	Code of Federal Regulations
CORS	Cross-Origin Resource Sharing
CRUD	Create, Read, Update, Delete
CSS	Cascading Style Sheets
GDPR	General Data Protection Regulation
HIPAA	Health Insurance Portability and Accountability Act
HTML	HyperText Markup Language
HTTP	HyperText Transfer Protocol
JPEG	Joint Photographic Experts Group
JSON	JavaScript Object Notation
JWT	JSON Web Token
LLM	Large Language Model
MERN	MongoDB, Express, React, Node.js
MIME	Multipurpose Internet Mail Extensions
NLP	Natural Language Processing
ODM	Object-Document Mapper
OWASP	Open Worldwide Application Security Project
PDF	Portable Document Format
PIN	Personal Identification Number
PNG	Portable Network Graphics
RBAC	Role-Based Access Control
REST	Representational State Transfer
RTL	Right-to-Left
SMTP	Simple Mail Transfer Protocol
TLS	Transport Layer Security
TTS	Text-to-Speech
UI	User Interface
WCAG	Web Content Accessibility Guidelines



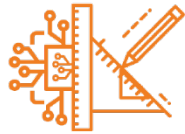
Abstract

NeuroLand is a full-stack platform that consolidates the fragmented workflow of paediatric and disability-focused therapy into a single product spanning web and mobile. Guardians register their dependents, search an admin-verified therapist directory, book and pay for sessions, message therapists in real time, and read progress reports that an AI layer can simplify into parent-friendly language. Therapists manage assigned patients, set their availability, run video sessions, draft reports with AI assistance, build treatment plans with measurable goals, and assign therapeutic activities. Institutions oversee a roster of therapists, monitor analytics, and manage enrolments, while administrators verify therapist credentials, manage roles and custom fields, generate per-user reports, and watch an append-only activity log of every sensitive action.

The system is delivered as three independent applications sharing one REST and Socket.io backend: a React web client, an Expo / React Native mobile app, and an Express + MongoDB server secured with JWT authentication, Helmet, rate limiting, and input validation. AI features are served by a locally hosted Ollama model behind a safety layer that redacts personally identifying information, blocks diagnostic prompts, and detects crisis language. Notifications are delivered across three channels — in-app, email, and mobile push — chosen per event from the recipient's preferences and online presence.

The result links every record — session to report to treatment plan to activity to progress timeline to guardian feedback — into a single longitudinal view, with a verification-and-audit posture suited to a healthcare-adjacent domain and a child-accessible, PIN-based patient interface offering adjustable font, contrast, text-to-speech, and a simplified mode.

Keywords: care coordination, telehealth, accessibility, role-based access control, real-time messaging, treatment plans, AI-assisted documentation, MERN, React Native, MongoDB.



1. Introduction

1.1 Problem Context

Families of children with disabilities — including autism, ADHD, dyslexia, and speech and motor delays — routinely struggle to find a licensed therapist with the right specialisation and proximity, to keep a consistent record of goals, progress, and homework activities across many visits, and to communicate with the therapist between sessions in a way that is logged, searchable, and visible to the institution that employs the therapist. They also frequently find a session's clinical notes hard to interpret, and have no easy way to carry the interactive parts of therapy onto a device a child can actually use.

On the supply side, therapists and institutions face their own friction: scheduling collisions, double-booked rooms, untracked no-shows, undocumented goal slippage, manual report writing, opaque billing, and the absence of a straightforward audit trail. Public listings on search engines and social media further make it easy for unverified providers to advertise alongside licensed ones, eroding trust in the entire category.

1.2 Project Goal

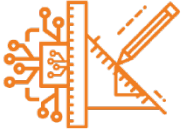
NeuroLand sets out to close those gaps in one product by combining four pillars: trusted discovery, an end-to-end care record, real-time collaboration, and accessibility and inclusion. Concretely, the project aims to deliver a single platform on which a guardian can discover a verified therapist, book and pay for a session, and follow a child's measurable progress over time, while the therapist and the supervising institution work from the same connected data.

Objectives

1. Provide trusted discovery in which every therapist must be admin-approved — with uploaded credential documents and a license number — before being listed or taking any action.
2. Maintain an end-to-end care record in which sessions, reports, treatment plans, activities, care updates, feedback, and payments are linked through a shared data model and rolled up into a single per-patient timeline.
3. Enable real-time collaboration through messaging, presence, in-app calling, and live notifications, with video sessions handled by WebRTC and Zoom integrations.
4. Make the product accessible and inclusive: a PIN-driven patient interface with font scaling, high contrast, text-to-speech, and a simplified mode, and a fully bilingual English / Arabic UI with right-to-left layout.

1.3 Scope

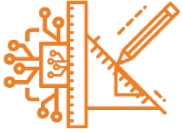
The deliverable is three working applications backed by one shared API. The web client serves guardians, therapists, institutions, and administrators; the mobile app serves guardians, therapists, patients, and institutions. Explicitly out of scope are formal clinical certification,



live payment-processor settlement (a mock provider is used with production scaffolding in place), and any feature that would position the system as a regulated medical device.

1.4 Organization of the Report

The remainder of this report is organised as follows. Chapter 2 presents the theoretical background and previous work, covering the literature that influenced the design, the underlying theory, comparable systems, and the earlier coursework the project draws on. Chapter 3 presents the methodology: the standards and codes followed, the project constraints, the engineering approach and system architecture used to deliver three apps and a shared API, the tools and technologies adopted, the testing and validation strategy, and a walkthrough of the web and mobile systems. Chapter 4 presents the resulting feature set and its analysis, Chapter 5 discusses the key design choices, trade-offs, and remaining limitations, and Chapter 6 closes the work with conclusions and recommendations, followed by the references.



2. Theoretical Background and Previous Work

The design of NeuroLand draws on prior work and existing products across care coordination, telehealth, accessible technology, and AI in clinical settings. Seven strands were most influential.

2.1 Care-Coordination Platforms

Products such as Practo, Zocdoc, Doxy.me, SimplePractice, and TheraNest demonstrate that booking, intake, payment, and basic charting can co-exist in a single web product. Almost all of them, however, are designed for adult outpatient care and treat the patient and the account holder as the same person. NeuroLand explicitly separates them: a guardian holds the account, while each patient is a dependent with their own PIN-protected interface and accessibility preferences.

2.2 Therapy Progress Tracking

Special-education and applied-behaviour-analysis tools such as Goalbook, Catalyst, and Rethink encode the idea that therapy is a series of goals, objectives, and measurable milestones. NeuroLand mirrors that structure in its treatment-plan model and pairs each goal with status so a progress panel can roll up goal progress, activity completion, session consistency, and report trends into a single suggested next action.

2.3 Verified-Provider Directories

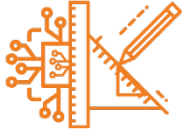
Public directories such as Psychology Today and BetterHelp show that, without enforced verification, listings quickly accumulate unverified providers. NeuroLand takes a stricter posture: a therapist account starts in a pending state, only verified therapists appear in the directory, and an admin must review uploaded credential documents before approval — enforced both server-side and client-side.

2.4 Accessible Interfaces for Children with Disabilities

Work around assistive tools such as Tobii and Proloquo2Go argues that child-facing interfaces should be PIN-based (children rarely manage email), should expose font size, contrast, and read-aloud as first-class settings, and should never penalise an incorrect tap. NeuroLand stores accessibility preferences at the dependent level, so siblings with different needs share one guardian account but receive personalised interfaces.

2.5 Real-Time Messaging in Clinical Contexts

Clinical messaging tools such as Spruce and Doximity show that healthcare messaging must support presence, delivery state, online/offline routing, and a fallback channel when the recipient is offline. NeuroLand follows this pattern: a real-time event is emitted when the receiver is online, and an email plus a mobile push are fired when they are not.



2.6 AI in Clinical Documentation

Recent ambient-documentation systems such as Nuance DAX, Suki, and Abridge show that language models can reduce documentation burden when their output is treated strictly as a draft rather than a final record. NeuroLand applies this principle: AI generates report drafts, simplifies clinical language into parent-friendly summaries, recommends activities, and produces progress insights — but every AI response carries a non-removable notice that a therapist must review and edit it, and the safety layer blocks diagnostic and crisis-adjacent prompts entirely.

2.7 Audit Logging in Healthcare-Adjacent Systems

Even outside formal regulatory scope, the literature — including HIPAA §164.312(b) and GDPR Article 30 — emphasises that any system handling sensitive personal records should keep a log of administrative actions. NeuroLand records every privileged admin action in a dedicated collection, indexed by admin, action key, and timestamp, and surfaces it in the admin dashboard as a filterable activity log.

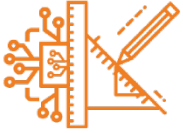
2.8 Architectural Foundations

NeuroLand is built on the client-server model, with a clear separation between a stateless REST API and the clients that consume it. The backend follows a layered architecture in which transport (routes), policy (middleware), orchestration (controllers), persistence (models), and reusable logic (utilities) are kept distinct. This is the conventional separation-of-concerns pattern from software engineering: business rules do not leak into routers, and persistence details do not leak into controllers.

The data layer uses a document database (MongoDB) accessed through an object-document mapper. The central design question in any document store is when to embed and when to reference. NeuroLand embeds tightly coupled, bounded sub-structures (for example a treatment plan's goals, objectives, and milestones, or a patient's accessibility preferences) and references entities that have an independent lifecycle (users, sessions, reports), trading some read amplification for referential clarity and smaller documents.

2.9 Authentication and Authorisation Theory

Authentication uses JSON Web Tokens, a stateless mechanism in which a signed token carries the user's identity so the server need not keep a session table. Passwords are never stored in plaintext; they are hashed with bcrypt, a deliberately slow, salted, adaptive hash designed to resist brute-force and rainbow-table attacks. Authorisation is implemented as role-based access control (RBAC): each user carries a role, and middleware guards restrict endpoints by role. The project extends classic RBAC with a permission registry and admin-defined roles, so capabilities can be granted by explicit permission keys rather than only by coarse role names.



2.10 Real-Time Communication Theory

Plain HTTP is request-response and cannot push data to a client. Real-time features therefore use WebSockets through the Socket.io library, which maintains a persistent bidirectional channel and degrades gracefully where WebSockets are unavailable. The server keeps in-memory maps of online users and active rooms; this presence model is what makes online/offline message routing, typing and delivery signals, and call invitations possible. Live audio and video use WebRTC, a peer-to-peer media protocol in which the server acts only as a signalling intermediary, with Zoom available as a managed alternative.

2.11 AI and Natural-Language Processing

The AI features rest on large-language-model inference served locally. The relevant theory is prompt engineering (constraining the model with explicit instructions and JSON-mode output), context-window budgeting (truncating inputs so they fit the model's token limit), and output safety. Because clinical text is sensitive, the system applies a redaction-before-inference principle: personally identifying tokens such as emails, phone numbers, and long identifiers are stripped before any text reaches the model. A pattern-based crisis detector short-circuits the model entirely when distress language appears, returning curated support resources instead of generated text.

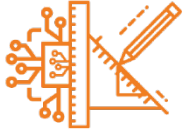
2.12 Previous and Comparable Work

Comparable commercial systems informed both the feature set and its boundaries. The table below positions NeuroLand against the typical baseline observed in those systems.

Table 1: Comparison of NeuroLand with typical existing platforms across key dimensions.

Dimension	Typical Platform	NeuroLand
Provider trust	Self-attested credentials, no document review	Credential upload plus admin review and post-approval revocation, all logged
Patient vs. guardian	Patient is the account holder	Guardian holds the account; each dependent is a separate patient with its own PIN and care record
Records linkage	Notes live in disconnected silos	Session, report, plan, activity, and feedback are linked and rolled up into one progress view
AI	None, or an unsafe direct integration	Local model with redaction, crisis interception, and a mandatory review notice
Child accessibility	Adult-targeted, email/password login	PIN login with per-patient font, contrast, TTS, and simplified mode
Localisation	English-only	Full English and Arabic with RTL

In short, prior work established the components — booking, charting, messaging, verification, and AI drafting — while NeuroLand's contribution is to compose them around a guardian-and-dependent model with verification and audit treated as foundations rather than additions.



2.13 Earlier Coursework Leveraged

The project draws directly on several earlier courses in the computer-engineering programme:

- **Web development.** REST design, JSON contracts, React component composition and hook patterns, controlled forms and validation, utility-first styling, and accessibility primitives.
- **Database systems.** Schema design (embedded versus referenced documents), compound indexes, and aggregation pipelines for statistics and counts-by-status.
- **Software engineering.** Layered architecture (routes, controllers, models, utilities), separation of role policy from transport, middleware composition, and fire-and-forget side effects that never block the user request.
- **Networks and security.** TLS by deployment, JWT signature verification, rate limiting, password hashing, replay-safe reset tokens, and file-upload allowlisting.
- **Mobile applications.** Stack and tab navigation composition, persisted-token auth context, focus-driven data fetching, and push tokens via Expo Notifications.
- **Human-computer interaction.** A simplified patient mode, font scaling, high contrast, text-to-speech, and a consistent role-aware design system so that no two dashboards feel like different products.
- **Artificial intelligence / NLP.** Prompt engineering, output-safety filtering, JSON-extraction parsing, context-window budgeting, and a knowledge-base-grounded chatbot.



3. Methodology

3.1 Development Approach

The project followed an iterative, feature-driven process. Rather than building each application to completion in isolation, the team built vertical slices: a feature was carried from the data model and API through to the web and mobile clients before the next was started. The verification-and-audit foundation was built first, and every subsequent feature was layered on top of it — the inverse of the common failure mode in which security and audit are bolted on at the end.

3.2 Standards and Codes Followed

Table 2: Engineering standards and conventions applied in the project, by area.

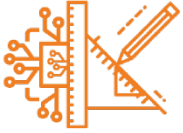
Area	Standard or Convention Applied
Authentication	JWT bearer tokens with bounded expiry; bcrypt password hashing (12 salt rounds); forgot-password flow using hashed, single-use, time-limited reset tokens.
Web security	Helmet security headers; CORS allowlist (production origin plus Expo development hosts); rate limiting on authentication and contact endpoints.
Input validation	All write endpoints validated through express-validator rule sets collected in a shared validators module.
File uploads	Whitelisted MIME types (PDF, JPEG, PNG, WebP); size cap; per-user directories; randomised server-side filenames; authenticated streaming download rather than a public static mount.
Accessibility	WAI-ARIA roles, visible focus rings, skip-to-content link, semantic HTML, text-to-speech, per-patient font and contrast preferences, and a simplified mode.
Internationalisation	Single message catalogue with English and Arabic keys; document direction toggled for RTL; numeric and date formatting via the Intl API.
Audit / privacy	Append-only administrative action log aligned in spirit with HIPAA §164.312(b) audit-control and GDPR Article 30 record-keeping principles.

3.3 Project Constraints

Multi-platform parity. The same data model and role logic must run identically across the web app and the mobile app. Any change to a role's workflow must land everywhere without divergence, which shaped the decision to centralise role logic on the server and keep the clients thin.

No clinical authority. The platform is explicitly not a medical device; it cannot diagnose, prescribe, or replace a clinician. Every AI feature is gated by a safety layer that intercepts diagnostic queries, redacts personal information before the model sees it, and surfaces a crisis-resources message when distress language is detected.

Trust by default. Therapists may sign up freely but cannot perform any privileged action — book, accept assignments, write reports, message guardians, or set availability — until an



administrator has reviewed their credentials and approved them. This is enforced at three layers: server middleware, route-level role guards, and a UI gate on both clients.

Healthcare-adjacent audit posture. Every sensitive administrative action (approving, rejecting, or revoking verification; approving or declining therapist changes and dependent deletions; deleting contact messages; generating user reports) is logged append-only with the admin's identity, the target type and id, and metadata.

Bilingual and right-to-left. The entire client UI is bilingual (English / Arabic) with full RTL layout, including dashboards, modals, status pills, and the rich-text report editor.

Free / open-source dependencies wherever possible. The AI stack uses self-hosted Ollama models, the email layer uses SMTP through Nodemailer, file uploads are stored on local disk with a clear migration path to object storage, and the payment layer ships as a mock by default with webhook handlers staged for real providers.

3.4 System Architecture

The system is composed of three independent applications sharing one backend over JSON-only HTTP and a single real-time channel. There is no other inter-app communication; the web and mobile clients are interchangeable consumers of the same API.

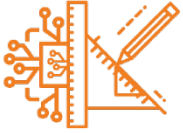
- **server** — an Express REST API with a Socket.io layer, backed by MongoDB through Mongoose.
- **client** — a React web application built with Vite and Tailwind, covering five role dashboards plus a public landing site.
- **mobile** — an Expo / React Native application using React Navigation stack and tab composition.

3.5 Backend Layering

The backend separates responsibilities across five layers. Routers are thin and only wire middleware to controllers. Middleware performs JWT verification, the therapist-approval gate, role guards, permission checks, upload handling, and validation. Controllers orchestrate the request and response. Models define the Mongoose schemas. Utilities hold pure, reusable logic for AI, email, push, pagination, audit logging, license validation, PIN generation, session-time helpers, payment providers, and the Zoom integration.

3.6 Data Model

Seventeen models form the domain. The user model is polymorphic by role, carrying role-specific fields alongside an extensible metadata map. The patient model is the dependent record, holding a PIN, disabilities and conditions, accessibility preferences, and embedded request workflows for assignment, therapist change, and deletion. The core care chain — session, report, treatment plan, activity, and care update — links every record to a patient and a therapist so that a single longitudinal timeline can be assembled. A dedicated administrative-



action model provides the append-only audit log, while role and field-definition models turn the admin panel into a self-service configuration surface.

3.7 Real-Time Layer

The server boots Socket.io with token-based authentication on connect and maintains in-memory maps of online users and active session and WebRTC rooms. Clients connect a single socket per session and listen for new-message, new-notification, incoming-call, room-presence, and WebRTC signalling events. When a message recipient is offline, the controller falls back to email; in all cases it also fires a mobile push so that a backgrounded app can wake.

3.8 AI Integration

AI features follow a uniform pipeline: input is prepared (truncated and redacted), sent to the local model in JSON mode, parsed and schema-validated, and finally annotated with a non-removable review notice. A crisis-pattern detector intercepts distress language and returns curated support resources instead of model output. The help chatbot streams its answer grounded in a knowledge base built from the project's own documentation at startup.

3.9 Notifications Fan-Out

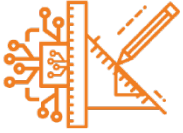
Three channels are kept in sync. In-app notifications create a document for every user-visible event, surfaced through a notification bell. Email templates send password-reset, session-reminder, weekly-digest, and new-message messages, with a weekly digest produced by a scheduled job. Mobile push uses stored Expo tokens, batching delivery, pruning invalid tokens, and degrading quietly on failure.

3.10 Front-End and Mobile Methodology

On the web, every dashboard reuses a single shell (sidebar, hero, statistic strip, and panels) with a role-specific accent palette, so the four role dashboards feel like one product. Protected routes gate each role's pages, with therapist routes additionally passing through an approval gate until verification succeeds. A bilingual catalogue and a direction toggle drive English/Arabic and RTL. The mobile app mirrors this with a bottom tab navigator inside the main stack, an authenticated socket connected at launch, a therapist approval-gate screen, and socket-driven chat that falls back to REST history on first load.

3.11 Tools and Technologies

NeuroLand is a MERN-family application extended with React Native on mobile and a self-hosted AI service. The tables below list the principal technologies adopted in each tier, taken from the project's dependency manifests.



3.11.1 Backend

Table 3: Backend technologies and their roles in the project.

Technology	Role in the Project
Node.js + Express 5	Runtime and HTTP framework for the REST API.
MongoDB + Mongoose 9	Document database and object-document mapper for all domain models.
Socket.io 4	Real-time messaging, presence, notifications, and WebRTC signalling.
jsonwebtoken 9 + bcryptjs	Stateless authentication tokens and salted password hashing.
Helmet 8, express-rate-limit 8, express-validator 7	Security headers, abuse protection, and input validation.
Multer 2	Multipart file uploads for therapist credentials and message attachments.
Nodemailer 8 + node-cron 4	Transactional email and the scheduled weekly digest.
expo-server-sdk 6	Server-side delivery of Expo push notifications.

3.11.2 Web Client

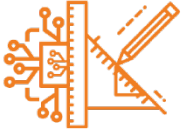
Table 4: Web client technologies and their roles in the project.

Technology	Role in the Project
React 19 + Vite 7	Component-based UI and the development/build toolchain.
Tailwind CSS v4	Utility-first styling and the shared design system.
React Router 7	Client-side routing and protected, role-gated routes.
TanStack React Query 5	Server-state fetching, caching, and synchronisation.
socket.io-client 4	Real-time channel for chat, presence, and notifications.
react-simple-wysiwyg + react-markdown + DOMPurify	Rich-text report authoring and safe rendering of AI and markdown content.
lucide-react	Icon set used consistently across dashboards.

3.11.3 Mobile App

Table 5: Mobile application technologies and their roles in the project.

Technology	Role in the Project
Expo 54 + React Native 0.81	Cross-platform mobile runtime and tooling.
React Navigation 7	Stack and tab navigation per role.
AsyncStorage	Persisted authentication token and local preferences.
axios	HTTP client for the shared REST API.
expo-notifications	Device registration and receipt of push notifications.



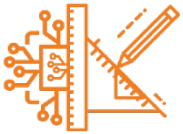
Technology	Role in the Project
expo-image-picker / expo-document-picker	Capturing images and documents for uploads.
socket.io-client 4	Real-time chat and notification channel.

3.11.4 Supporting Services and Tooling

- **Ollama (local LLM).** Serves quantised instruction-tuned models for report drafting, simplification, activity recommendation, progress insights, and the help chatbot, with deterministic fallbacks when the service is unavailable.
- **Zoom + WebRTC.** Video-session rooms, with the server providing signalling and Zoom as a managed alternative.
- **Payment providers.** A mock provider by default, with webhook handlers and provider scaffolding staged for real settlement.
- **Git + ESLint.** Version control and linting to keep the codebase consistent across three applications.

3.12 Testing and Validation

A formal automated suite was out of scope, but the project was validated through continuous manual exercise across all roles on both clients, a demo-seed script that creates a representative dataset (administrators, institutions, therapists in every verification state, guardians with dependents, and sessions in every status) so end-to-end flows can be reproduced in seconds, a database connectivity smoke check, and a permissions cache whose invalidation is exercised every time a role is mutated.



3.13 System Walkthrough (Web)

This subsection presents the delivered web interface as a guided walkthrough, ordered to follow the system flow described above: from public discovery and onboarding, through the administrator and institution consoles, to the therapist, guardian, and patient experiences. Each figure is captioned, and a complete list appears in the Table of Figures at the front of the report.

A. Public Landing Page and Discovery

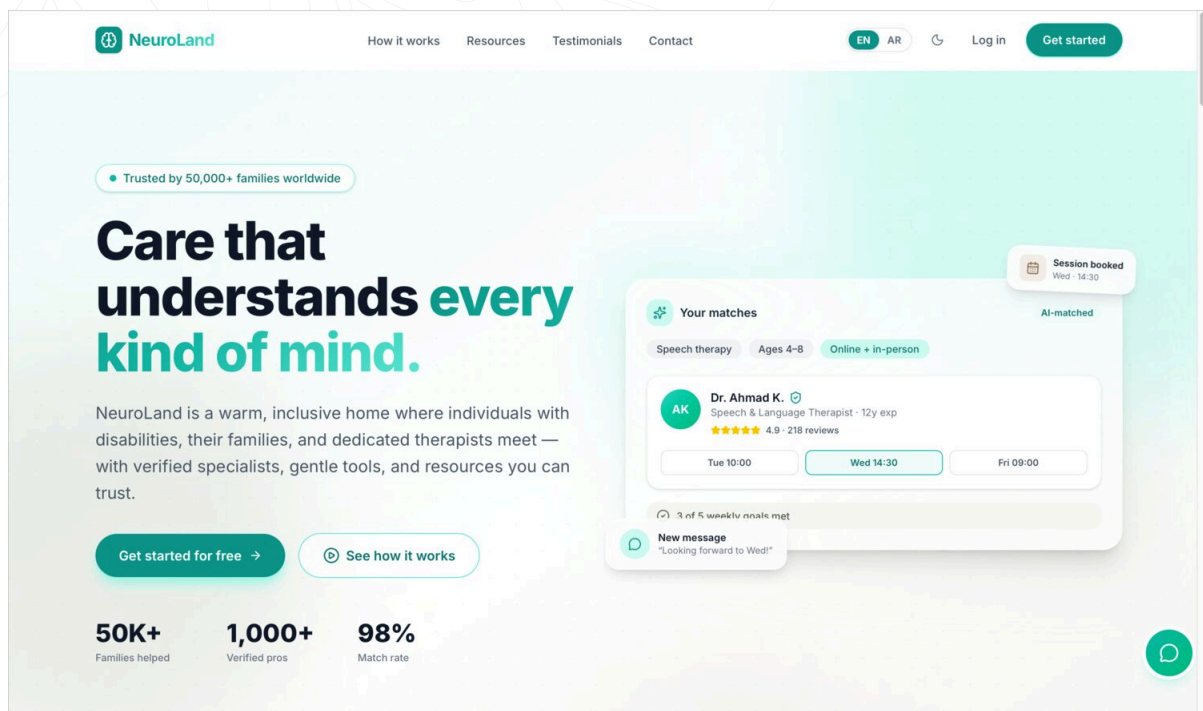


Figure 1: Landing hero introducing the platform with headline statistics on reach and verification.



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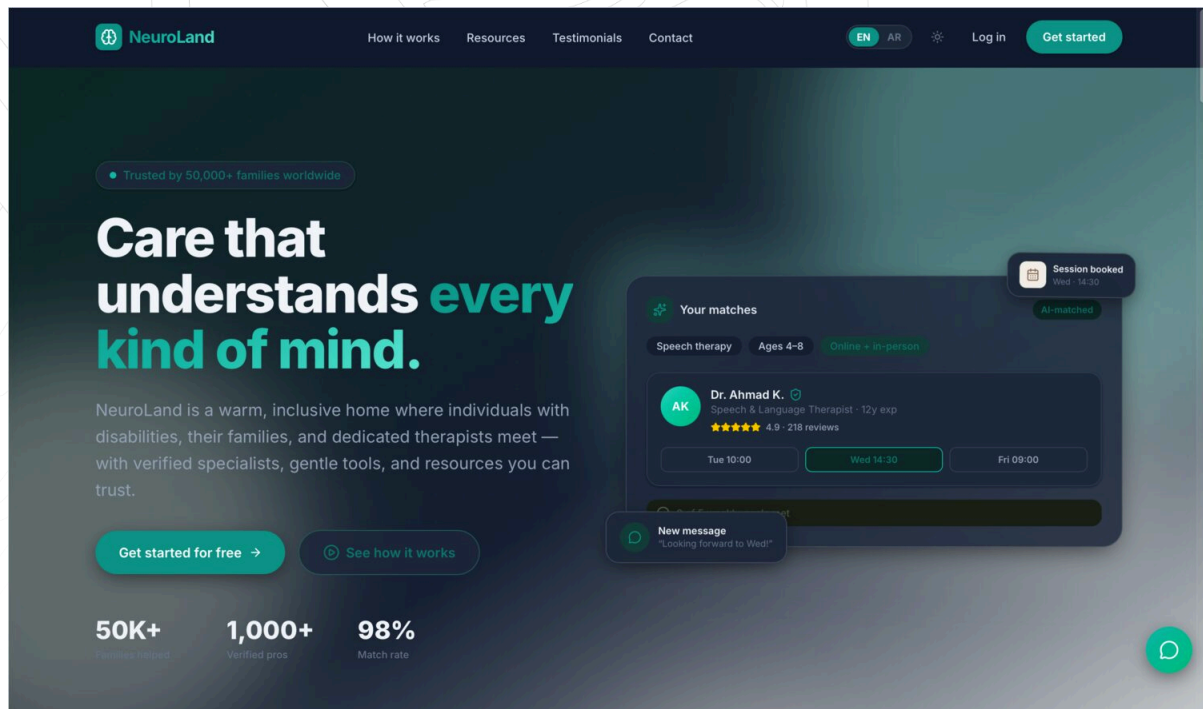
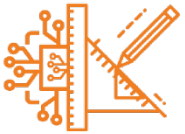


Figure 2: Dark-mode landing hero featuring a verified-therapist preview card.

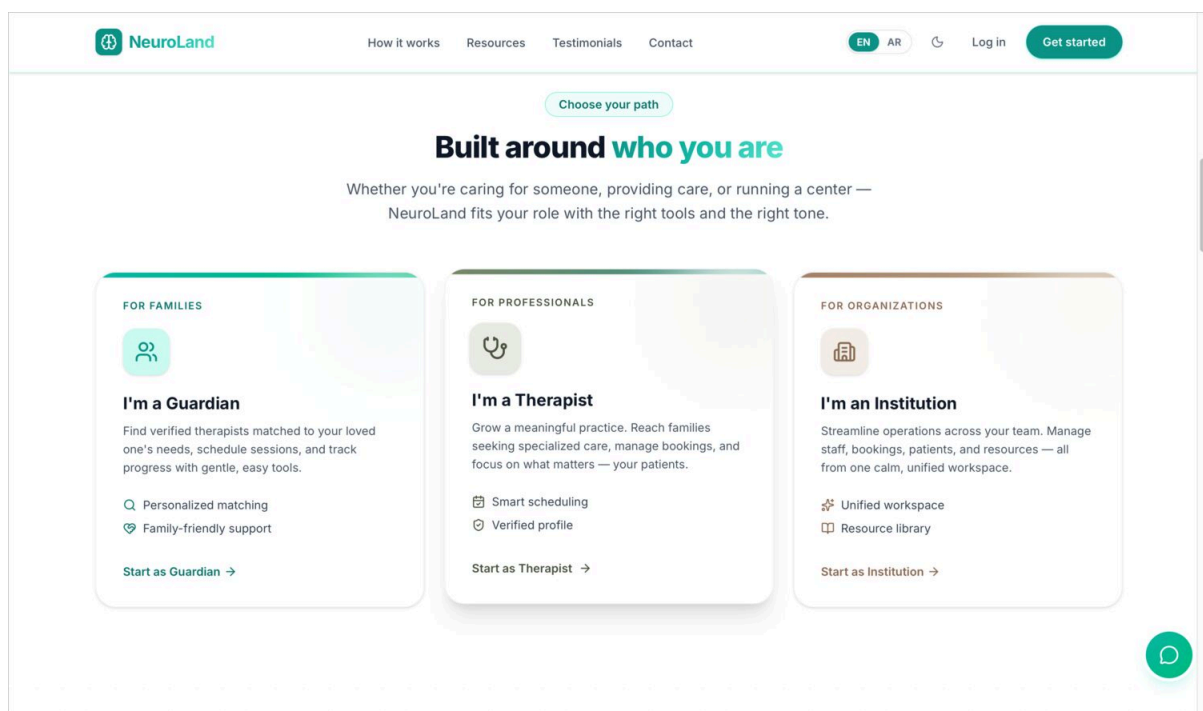


Figure 3: “Built around who you are” — role selection for guardian, therapist, and institution.



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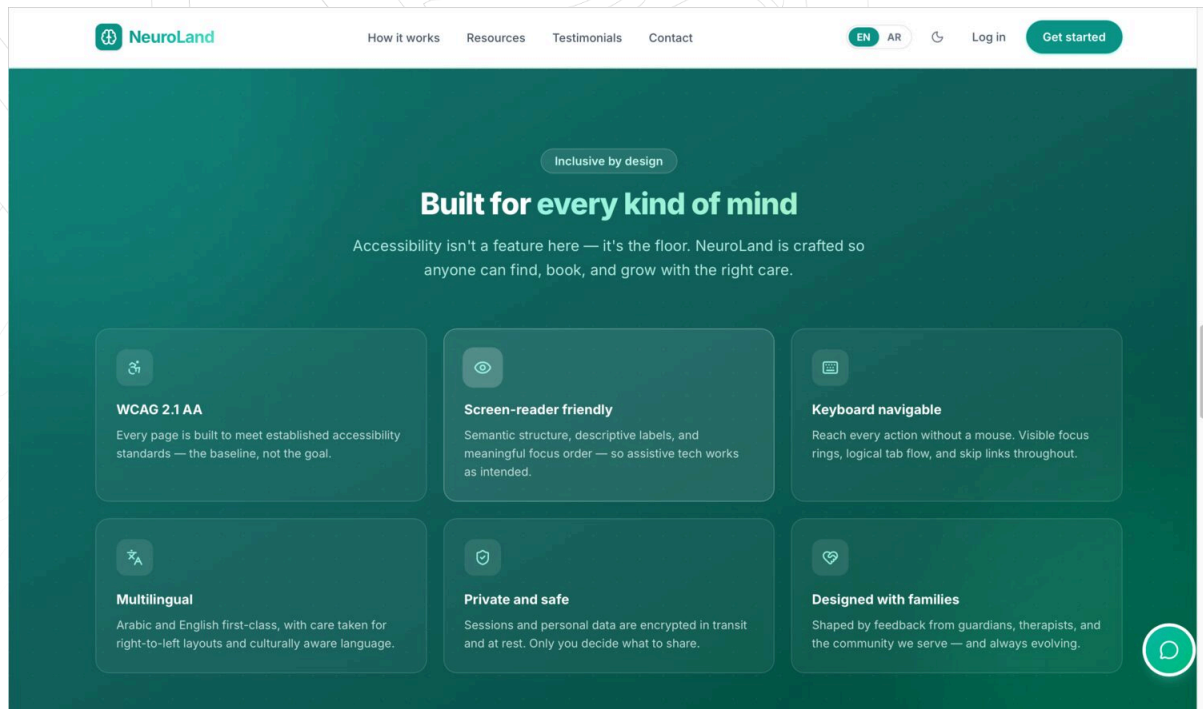
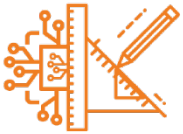


Figure 4: Accessibility and trust section highlighting WCAG support, screen-reader friendliness, and privacy.

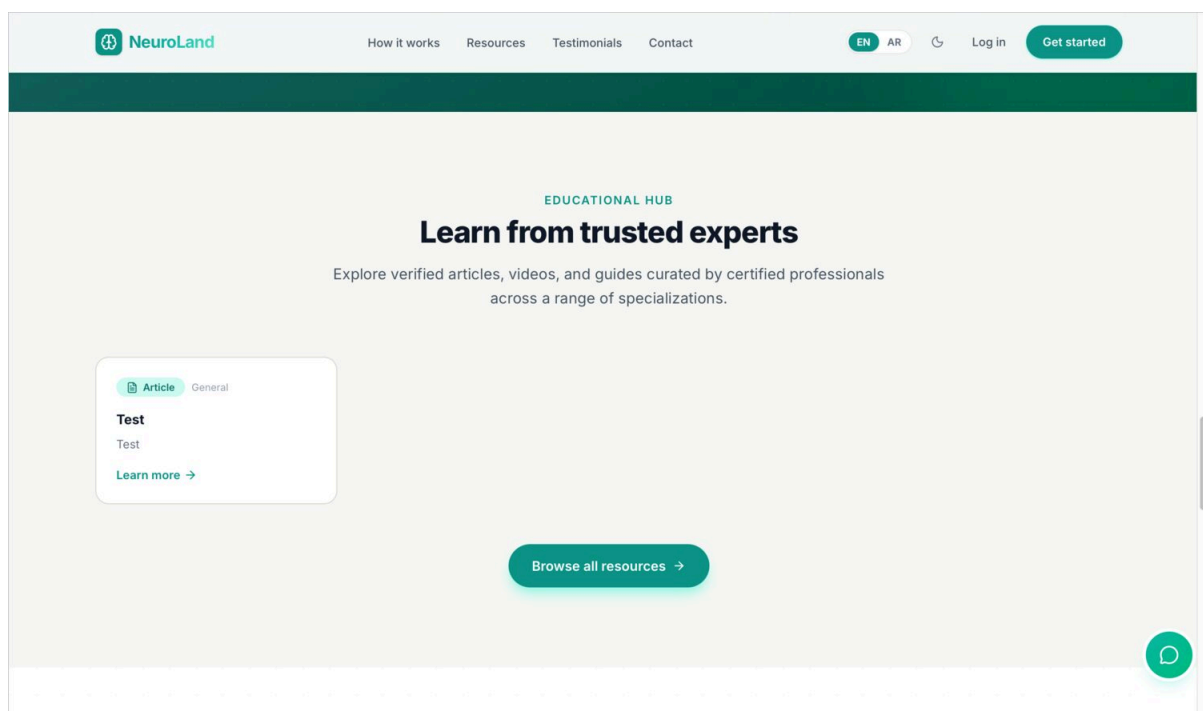


Figure 5: Educational hub preview showing articles and resources from verified experts.



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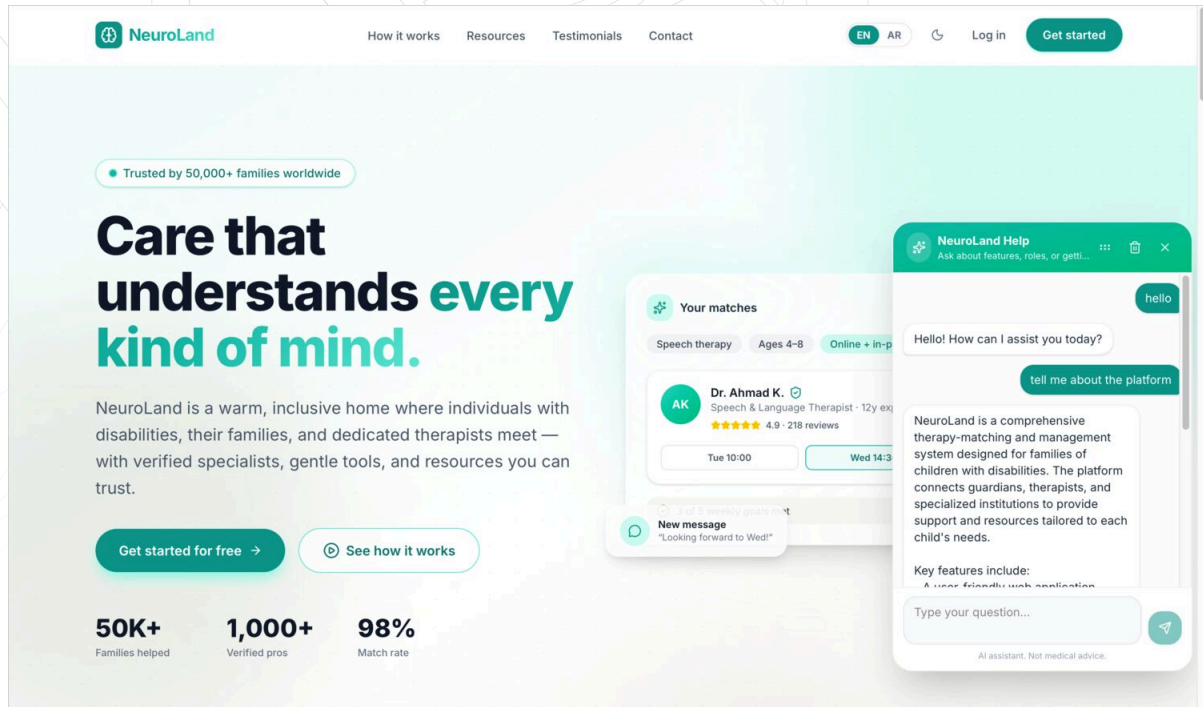
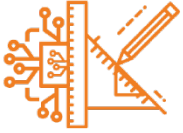


Figure 6: Landing page with the knowledge-base help chatbot opened.

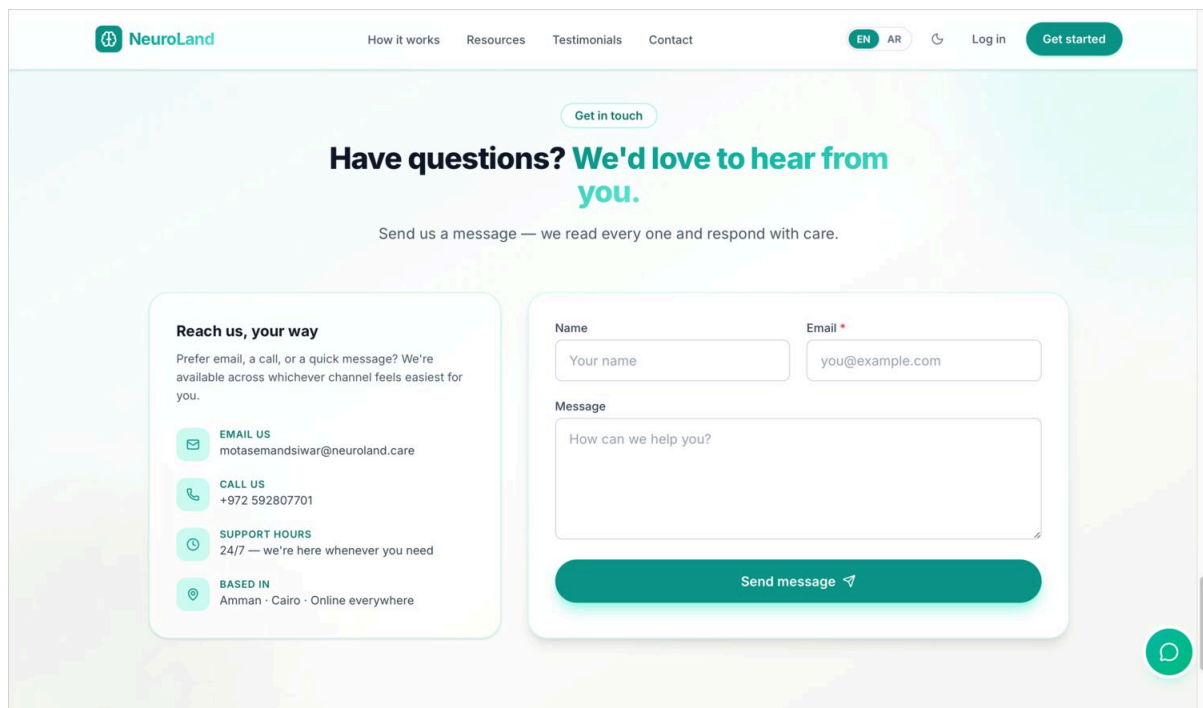


Figure 7: Public contact form used by visitors to send inquiries to administrators.



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Figure 8: Arabic (right-to-left) landing hero demonstrating the fully bilingual layout.

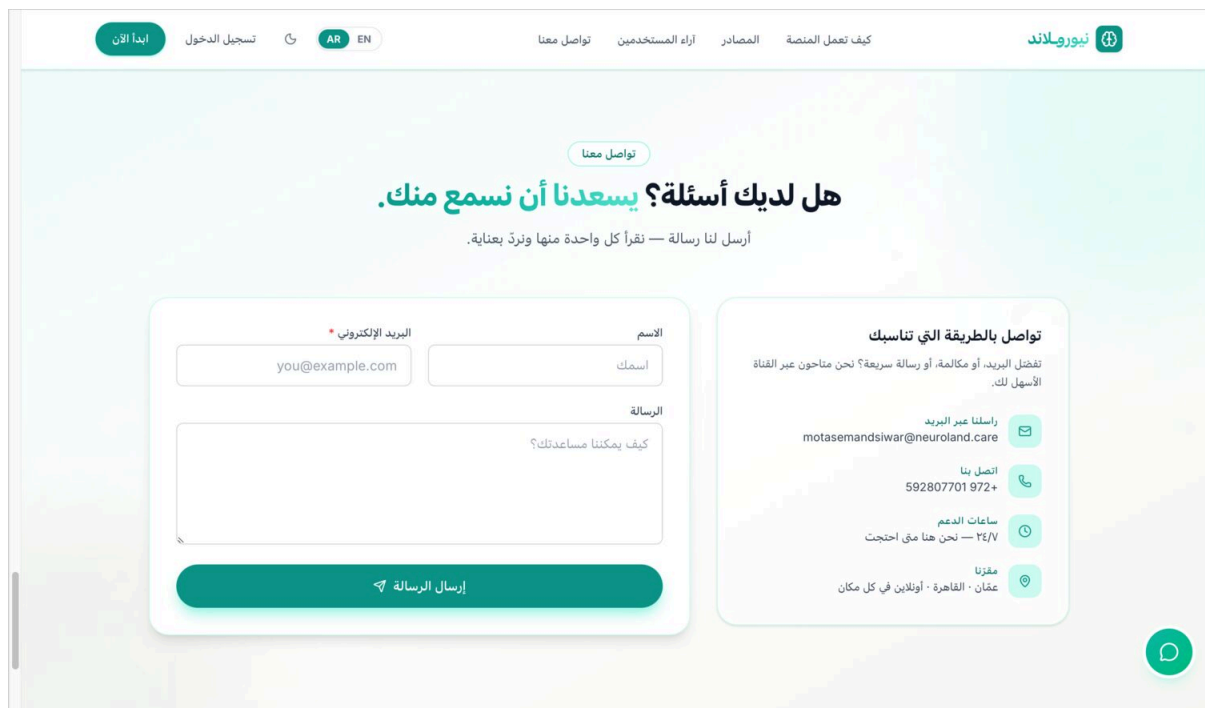


Figure 9: Arabic (right-to-left) contact section with mirrored form fields.



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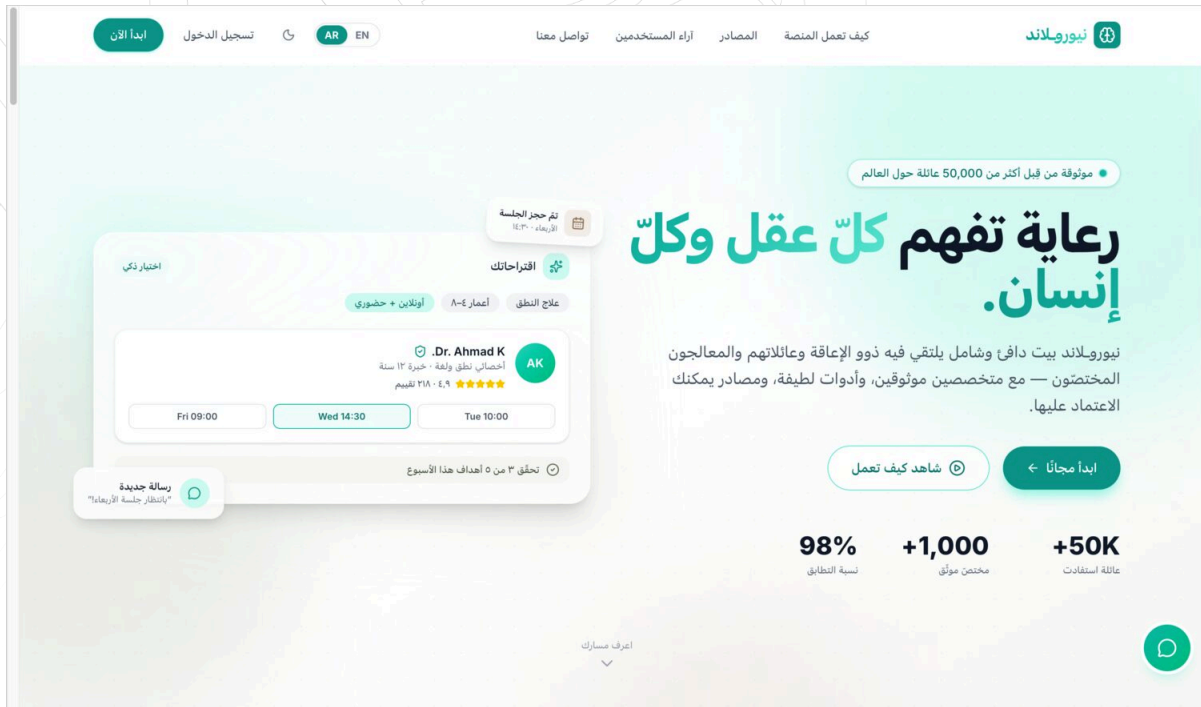
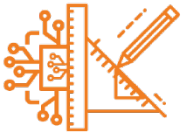


Figure 10: Arabic (right-to-left) care section with mirrored navigation and content.

B. Registration, Onboarding, and Verification

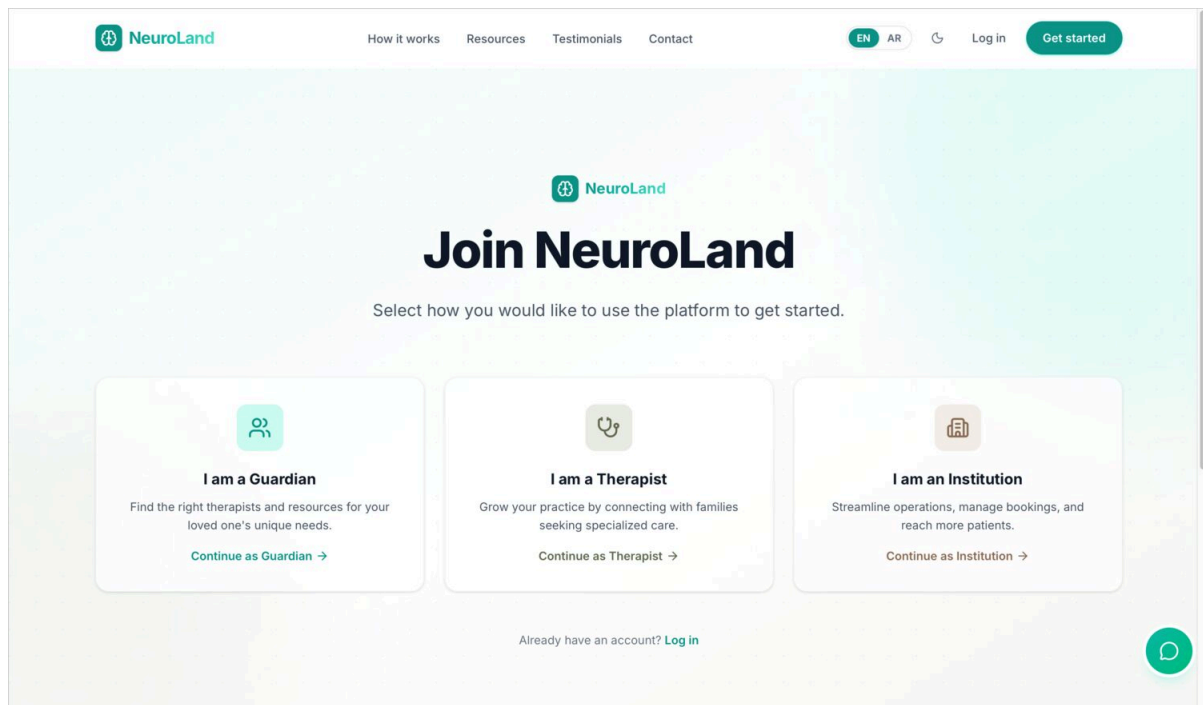


Figure 11: "Join NeuroLand" account-type selection at the start of sign-up.



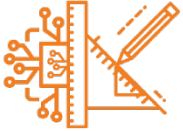
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The screenshot shows the 'Register as a Guardian' form on the NeuroLand website. The form is titled 'Register as a Guardian' with the subtitle 'Step 1 of 2: Guardian account information'. It includes fields for 'Full Name' (Guardian1), 'Email Address' (guardian@neuro.co), 'City' (Nablus), 'Phone Number (optional)' (+972 000 000 0000), 'Password', and 'Confirm Password'. There is a 'Good' progress indicator and a checkbox for 'I agree to NeuroLand's Terms of Service and Privacy Policy'. A 'Continue to Dependents' button is at the bottom.

Figure 12: Guardian registration, step one — account details.

The screenshot shows the 'Register as a Guardian' form on the NeuroLand website, Step 2 of 2: Dependent information. It includes a 'Dependents' section with a '+ Add Dependent' button. Under 'Dependent #1', there are fields for 'Dependent Name' (Dependent1) and 'Age' (9). Below this is a 'Supported Disabilities' section with a '+ Add Disability' button. It contains two rows of disabilities: 'Physical Disa' (Physical / Motor Disability) and 'Neuro Disabil' (ADHD), each with a severity level (Mild or Severe). There is a 'Describe the case (optional)' text area with a character count of 0 / 4000. At the bottom, there are 'Back' and 'Create Guardian Account' buttons.

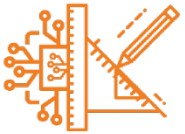
Figure 13: Guardian registration, step two — adding dependents and their accessibility needs.



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NeuroLand

How it works Resources Testimonials Contact

EN AR Log in Get started

Join as a Therapist
Connect with families who need your expertise

Full Name
Therapist1

Official Email
therapist1@neuro.co

City
Nablus

Phone Number (optional)
+972 000 000 0000

Specialization
Select the areas you are qualified to provide. 3 selected

Search specializations

All Neurodevelopment Communication Motor & sensory
Learning Behavioral Clinical care

Figure 14: Therapist registration — professional profile form.

NeuroLand

How it works Resources Testimonials Contact

EN AR Log in Get started

Specialization
Select the areas you are qualified to provide. 3 selected

Search specializations

All Neurodevelopment Communication Motor & sensory
Learning Behavioral Clinical care

ADHD X Autism X Speech Therapy X

☐ ABA Therapy
Behavioral

☒ ADHD
Neurodevelopment

☒ Autism
Neurodevelopment

☐ Behavioral Therapy
Behavioral

☐ Dyslexia
Attention

Years of Experience
5 - 10 years

License Number
TH-2468-0
Format: TH-NNNN-C (5 digits + check digit)

Institution Affiliation (optional)
Select or leave independent...

Figure 15: Therapist registration — specialisation selection.



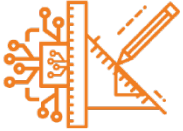
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NeuroLand

How it works Resources Testimonials Contact

EN AR Log in Get started

☐ Behavioral Therapy
Behavioral

☐ Dyslexia
Dyslexia

Years of Experience
5 - 10 years

License Number
TH-2468-0
Format: TH-NNNN-C (5 digits + check digit)

Institution Affiliation (optional)
Select or leave independent...

Password
.....

Good

Confirm Password
.....

☒ I agree to NeuroLand's [Terms of Service](#) and [Privacy Policy](#)

Create Therapist Account →

Already have an account? [Log in](#)
Not a therapist? [Go back](#)

Figure 16: Therapist registration — experience, license number, and institution affiliation.

NeuroLand

How it works Resources Testimonials Contact

EN AR Log in Get started

Register your institution
Join NeuroLand as a specialized care provider

Contact Person Name
Owner1

Institution Name
Institution1

Institution Type
☒ Autism Center ☐ Dyslexia ☐ Speech & Language Therapy
☐ ADHD ☒ Psychiatric & Mental Health Clinic
☐ Special Education School ☐ Sensory Integration Center
☒ Developmental Pediatrics ☐ Other

Official Email
institution@neuro.co

City
Nablus

Phone Number (optional)

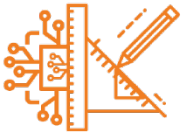
Figure 17: Institution registration form for clinics and schools.



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How it works Resources Testimonials Contact

EN AR Log in Get started

ADHD ☒ Psychiatric & Mental Health Clinic
Special Education School Sensory Integration Center
☒ Developmental Pediatrics Other

Official Email institution@neuro.co City Nablus

Phone Number (optional) +972 000 000 0000

Password *****

Good

Confirm Password *****

☒ I agree to NeuroLand's [Terms of Service](#) and [Privacy Policy](#)

Create Institution Account →

Already have an account? [Log in](#)
Not an institution? [Go back](#)

Figure 18: Institution registration — continued details and contact information.

NeuroLand

How it works Resources Testimonials Contact

EN AR Log in Get started

NeuroLand
Care that understands every mind.
Connecting families with verified therapists.

- Verified professionals you can trust
- Compassionate care for every mind
- AI-powered therapy matching

Welcome back
Log in to your NeuroLand account

Email address you@example.com

Password Enter your password [Forgot password?](#)

☐ Remember me

Log in →

Don't have an account? [Sign up for free](#)

Figure 19: Shared login screen used by all roles.



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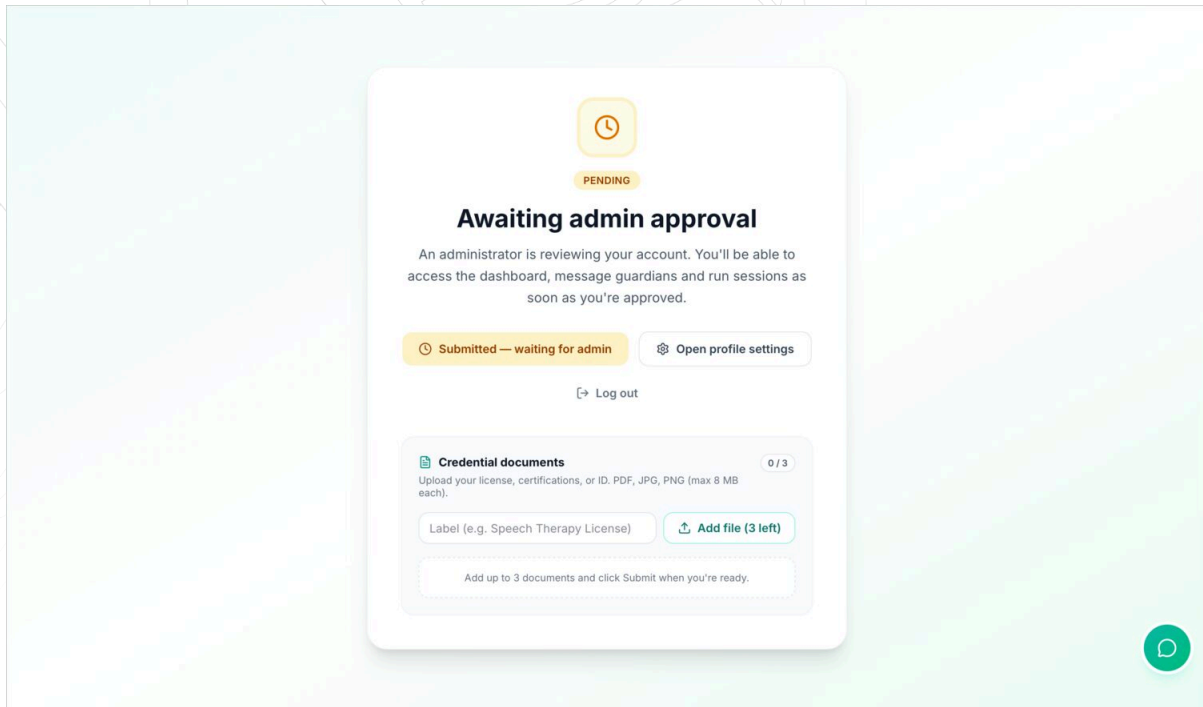
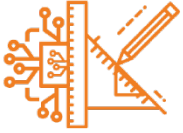


Figure 20: Therapist approval gate — “Awaiting admin approval” with credential upload.

C. Administrator Console

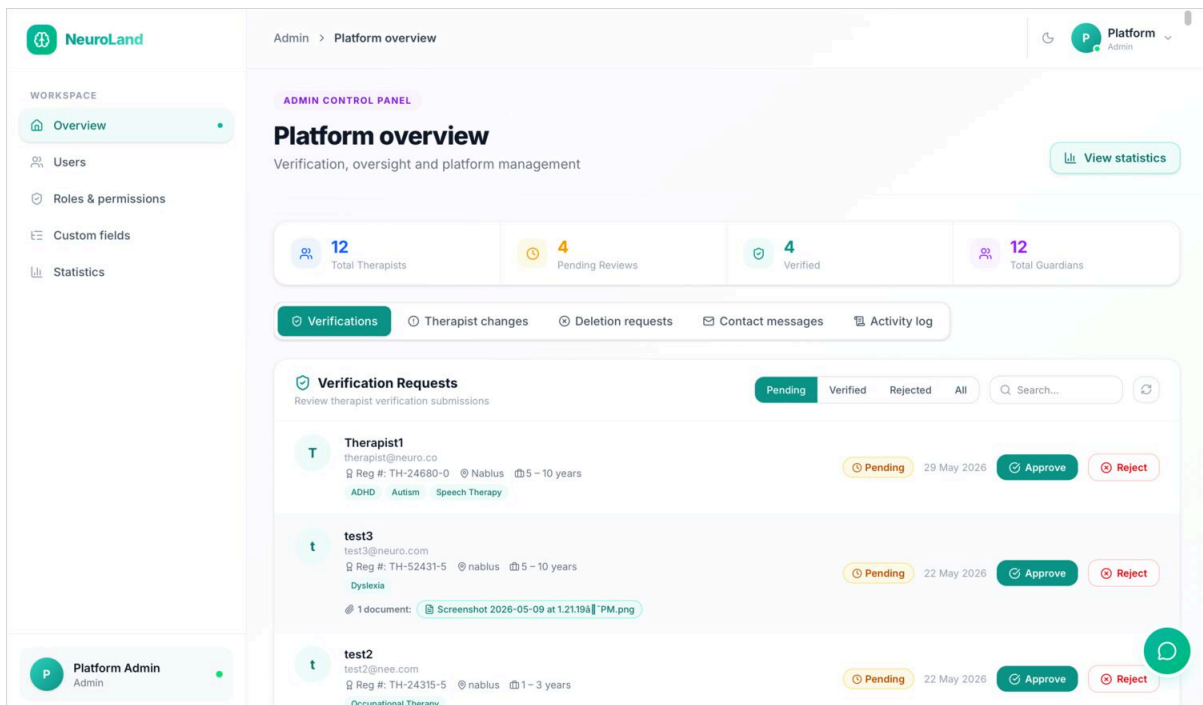
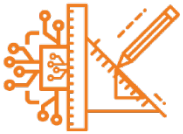


Figure 21: Verification-requests queue with per-therapist approve and reject actions.



The screenshot displays the 'Platform overview' section of the NeuroLand Admin interface. The left sidebar contains navigation links for Overview, Users, Roles & permissions, Custom fields, and Statistics. The main content area is titled 'Platform overview' and includes a summary of platform statistics: 12 Total Therapists, 4 Pending Reviews, 4 Verified, and 12 Total Guardians. Below this, there are tabs for Verifications, Therapist changes (selected), Deletion requests, Contact messages, and Activity log. The 'Therapist Change Requests' section shows a list of requests, with one request from 'ahmed' (Guardian: test, Current therapist: Siwar Diab, Requested: 21 Apr 2026) currently in 'Pending' status. The request details include a 'GUARDIAN NOTE' stating 'I want another therapist' and an 'Optional admin note visible to guardian'. At the bottom, there are buttons for 'Approve and Reassign' and 'Decline'. A chat icon is visible in the bottom right corner.

Figure 22: Therapist change-request review panel.

The screenshot displays the 'Platform overview' section of the NeuroLand Admin interface, specifically the 'Dependent Deletion Requests' review panel. The left sidebar is identical to the previous screenshot. The main content area shows the same summary statistics. The 'Deletion requests' tab is selected, and the 'Dependent Deletion Requests' section is displayed. It indicates that there are 'No deletion requests' currently, with a note stating 'Requests will appear here once guardians submit them.' The interface includes tabs for Pending, Reviewed, and All requests. A chat icon is visible in the bottom right corner.

Figure 23: Dependent deletion-request review panel.



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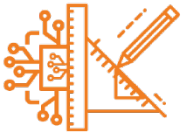


Figure 24: Contact-message inbox forwarded from the public landing page.

Figure 25: Append-only activity log recording every privileged administrative action.



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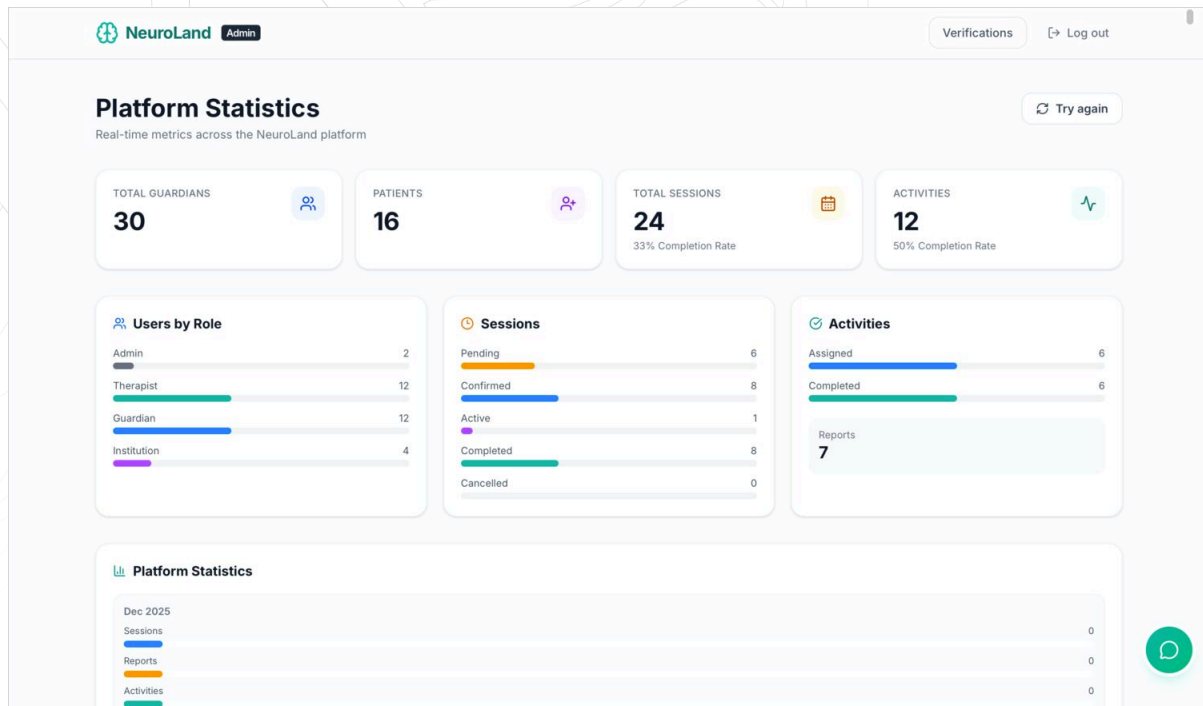
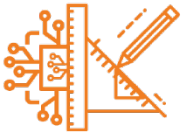


Figure 26: Platform-statistics overview with users-by-role, session, and activity charts.

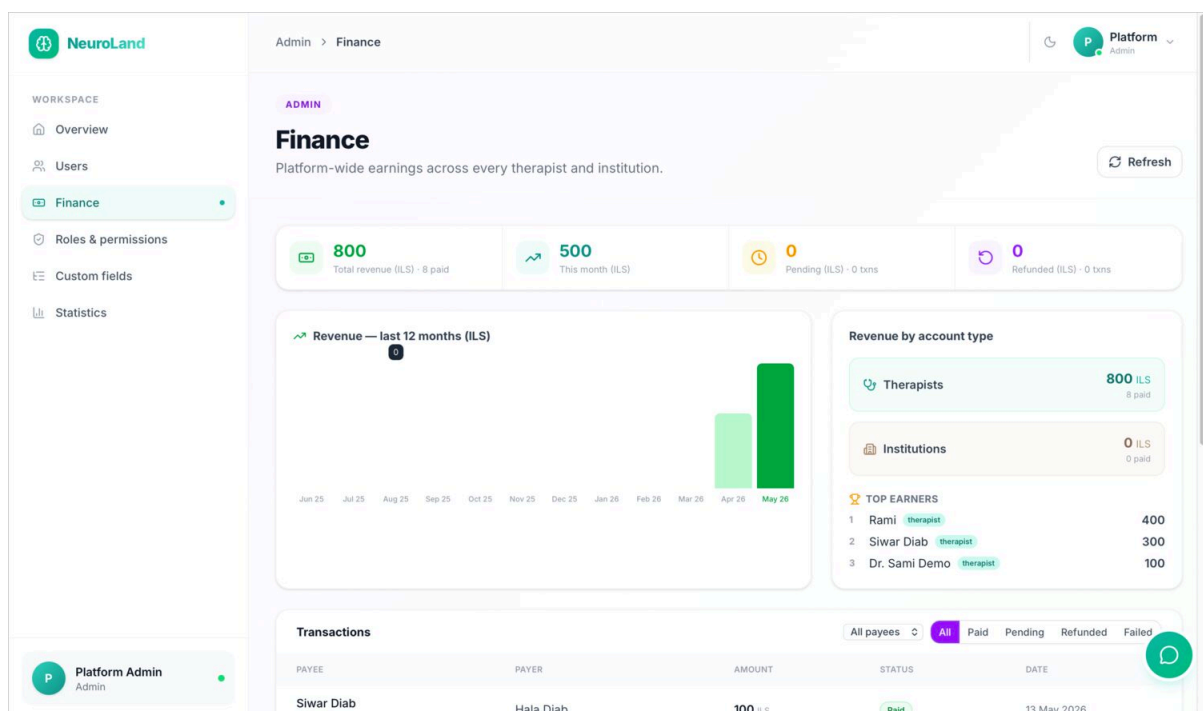
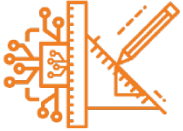


Figure 27: Finance overview — platform earnings and revenue by account type.



NeuroLand Admin > Users Platform Admin

WORKSPACE

- Overview
- Users**
- Roles & permissions
- Custom fields
- Statistics

ADMIN

Users

Browse every account on the platform. Open a user to build a customised report.

Search by name, email, phone, city... All roles Refresh

NAME / CONTACT	EMAIL	ROLE	CITY
Therapist1	therapist@neuro.co	therapist	Nablus
test3	test3@neuro.com	therapist	nablus
test2	test2@nee.com	therapist	nablus
test	test@therapy.land	therapist	nablus
Khalid	khalid@therapy.com	therapist	Nablus
Unknown Guardian	kjbkb@jhvbjhvjibi	guardian	—
Platform Demo Admin +970 599 000 004	demo.admin@neuroland.test	admin	Nablus
Amina Demo +970 599 000 003	demo.guardian@neuroland.test	guardian	Nablus
Dr. Sami Demo +970 599 000 002	demo.therapist@neuroland.test	therapist	Nablus

Figure 28: User directory for browsing and searching every account.

NeuroLand Admin > User detail Platform Admin

WORKSPACE

- Overview
- Users**
- Roles & permissions
- Custom fields
- Statistics

ADMIN

User detail

Review the user, build a custom report, edit metadata, and grant extra permissions. Back to users

Motasem
mojararah@gmail.com
guardian Nablus
Joined 03/04/2026

Custom report

Pick sections, choose a date range, then generate.

☒ Profile ☒ Role-specific fields ☒ Verification

☒ Sessions ☒ Reports ☒ Dependents

☒ Activities ☒ Ratings ☒ Custom metadata

☒ Permissions

Date range (applies to sessions, reports, activities, dependents)

From: 29/05/2026 To: 29/05/2026 Recent items per section: 10

Last 7 days Last 30 days Last 90 days Last 12 months All time

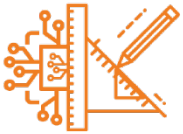
Figure 29: User-detail report builder with selectable report sections.



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Admin > User detail
Motasem
mojararah@gmail.com
guardian Nablus

Custom report
Pick sections, choose a date range, then generate.

☒ Profile ☒ Role-specific fields ☒ Verification
☒ Sessions ☒ Reports ☒ Dependents
☒ Activities ☒ Ratings ☒ Custom metadata
☒ Permissions

Date range (applies to sessions, reports, activities, dependents)
From: 29/05/2026 To: 29/05/2026 Recent items per section: 10
Last 7 days Last 30 days Last 90 days Last 12 months All time

Generate report Select all Clear **Print / save PDF**

User report
Motasem
Range: All time Limit: 10 recent items per section
Generated 29/05/2026, 09:46:05

PROFILE

Figure 30: Custom user report with date-range presets and PDF export.

Admin > User detail
Generate report Select all Clear

User report
Motasem
Range: All time Limit: 10 recent items per section
Generated 29/05/2026, 09:46:05

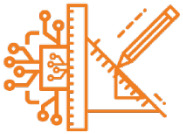
PROFILE
EMAIL: mojararah@gmail.com
ROLE: guardian
FULLNAME: Motasem
PHONE:
CITY: Nablus
CREATEDAT: 2026-04-03T12:10:07.893Z
UPDATEDAT: 2026-04-03T12:10:07.893Z

ROLE-SPECIFIC FIELDS
FULLNAME: Motasem

SESSIONS
COUNTSBYSTATUS: ACTIVE: 1, COMPLETED: 4, CONFIRMED: 3
TOTAL: 8

RECENT
_ID: 69fe68dc5afe1fbd3dc20330
PATIENTID: 69fd25ee07d0470e88f2099b
DATE: 2026-05-08T21:00:00.000Z
STARTAT: 2026-05-09T06:00:00.000Z
ENDAT: 2026-05-09T07:00:00.000Z

Figure 31: Generated, printable per-user report.



NeuroLand Admin > User detail

COMPLETED 1
ASSIGNED 2

Platform Admin

WORKSPACE

- Overview
- Users
- Roles & permissions
- Custom fields
- Statistics

CUSTOM METADATA

PERMISSIONS

EFFECTIVE	Empty.
EXTRA	Empty.

Custom fields

Editing 0 admin-defined fields for this role.

No custom fields apply to this role yet. Add some on the Custom fields page.

Extra permissions

Grants that apply to this user on top of whatever the guardian role carries.

☐ users:read Browse the user directory and read profiles.	☐ users:write Edit user records, metadata, and extra permissions.
☐ users:delete Permanently delete user accounts.	☐ reports:export Generate and download per-user reports (PDF).
☐ roles:read View the role catalogue.	☐ roles:manage Create, edit, and delete roles (system roles are protected).
☐ fields:manage Define and edit custom user fields (FieldDefinition).	☐ verifications:manage Approve, reject, and revoke therapist verifications.
☐ change-requests:manage Handle therapist-change and dependent-deletion requests.	☐ stats:read Read admin dashboards and statistics overviews.

Platform Admin Admin

Figure 32: Per-user custom metadata and extra permission grants.

NeuroLand Admin > Roles & permissions

Platform Admin

WORKSPACE

- Overview
- Users
- Roles & permissions
- Custom fields
- Statistics

ADMIN

Roles & permissions

Define what each role can do. System roles can't be renamed or deleted, but their permission set can be edited.

+ New role

Administrator admin system	Edit
Full platform access. Manages verifications, users, roles, fields. 10 permissions · 2 users	
Guardian guardian system	Edit
Parent/guardian of one or more dependents. 0 permissions · 12 users	
Institution institution system	Edit
Institutional account that manages affiliated therapists. 0 permissions · 4 users	
Therapist therapist system	Edit
Provides therapy. Manages own patients, sessions, reports. 0 permissions · 12 users	

Platform Admin Admin

Figure 33: Roles-and-permissions management with admin-defined roles.



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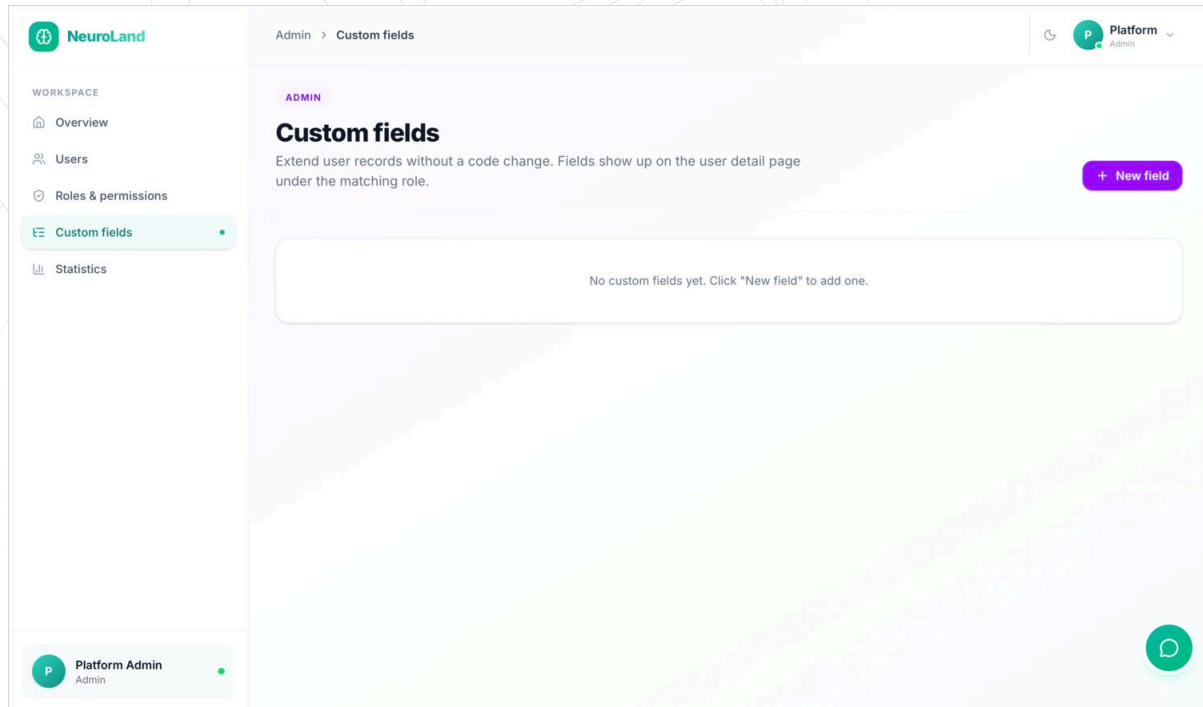
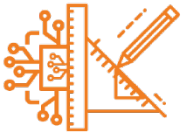


Figure 34: Admin-defined custom user fields.

D. Institution Console

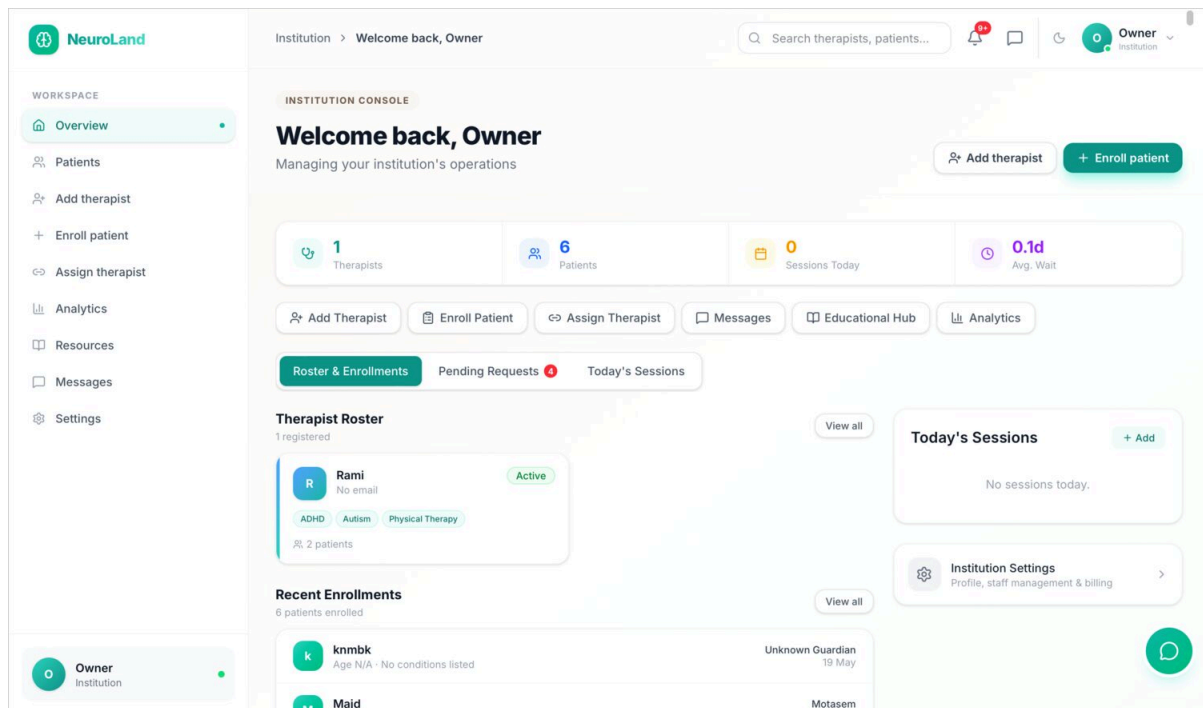


Figure 35: Institution overview — therapist roster, recent enrolments, and today's sessions.



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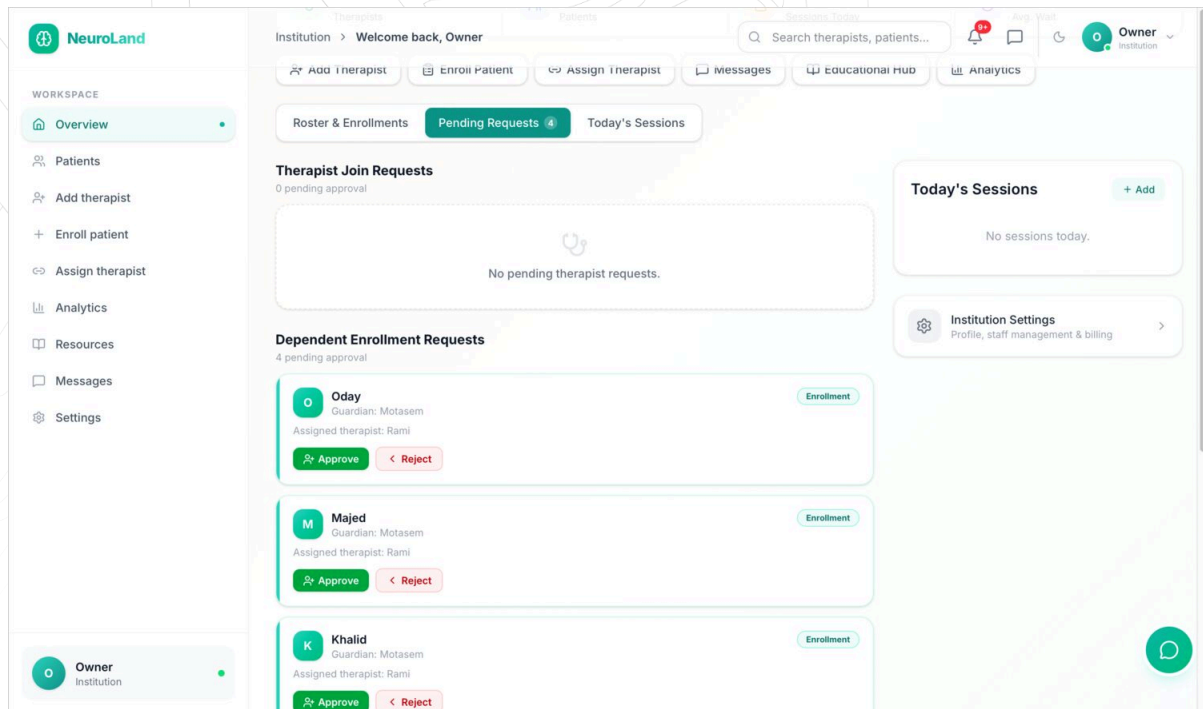
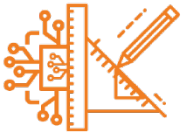


Figure 36: Pending therapist-join and dependent-enrolment requests awaiting approval.

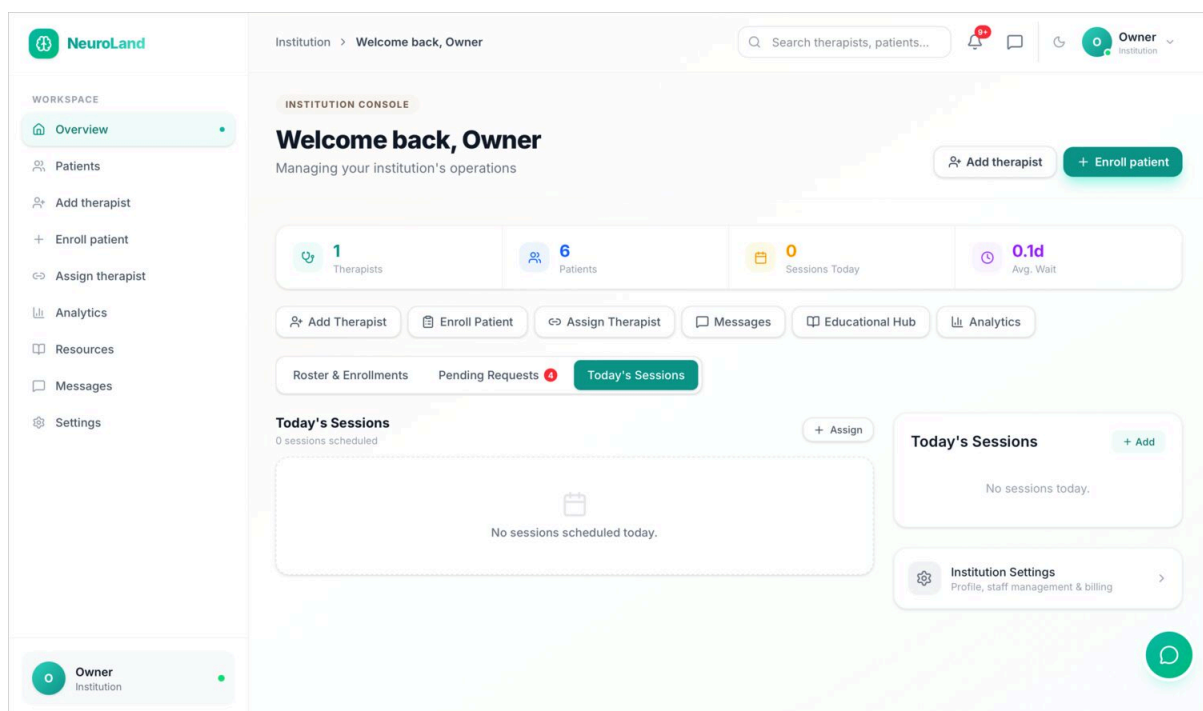


Figure 37: Today's scheduled sessions across the institution.



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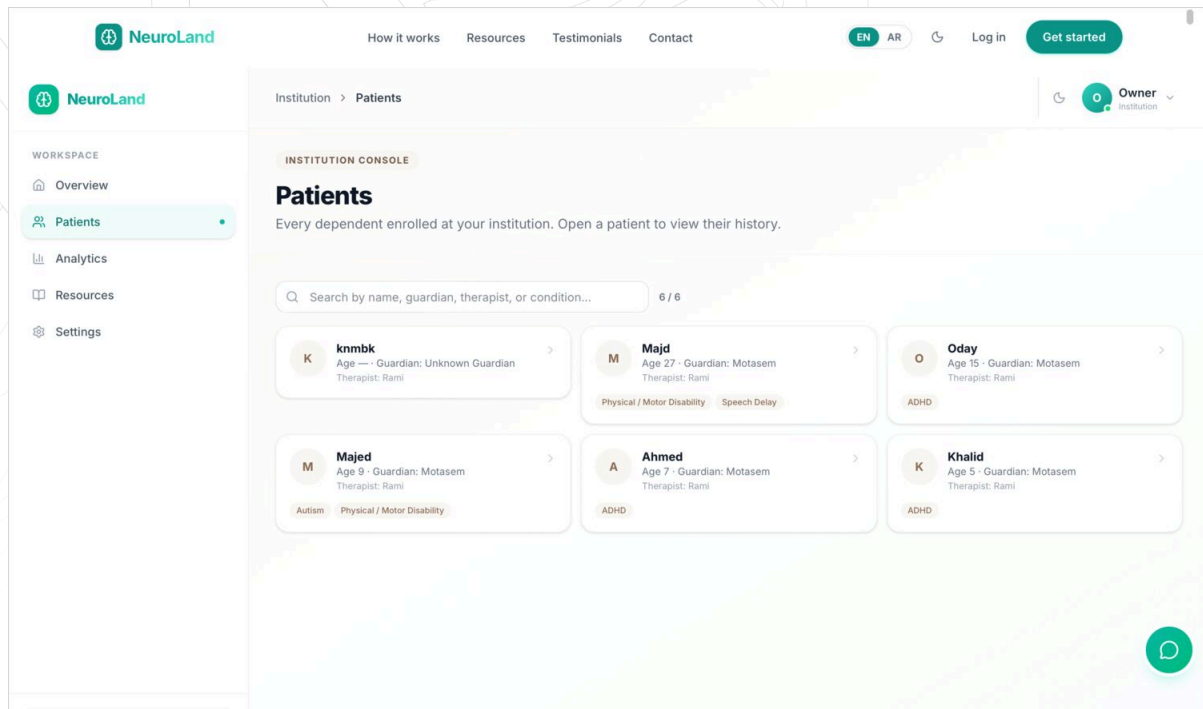
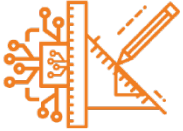


Figure 38: Patients enrolled across the institution.

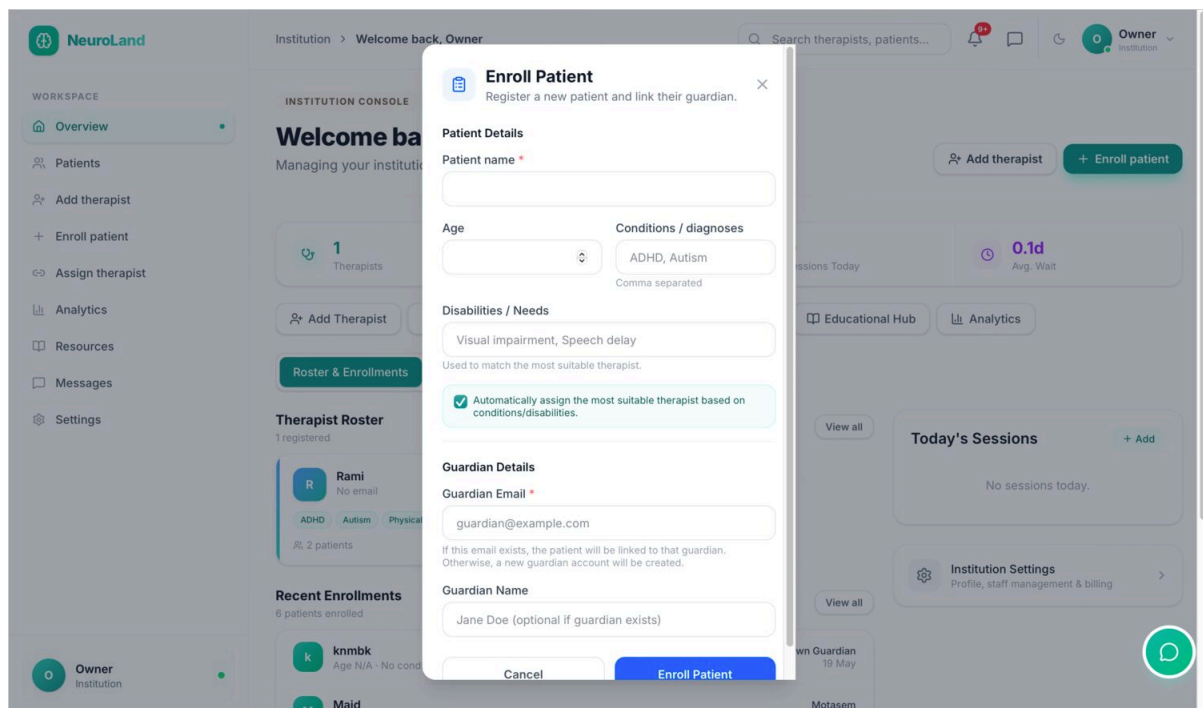


Figure 39: Enroll-patient dialog linking a dependent to the institution.



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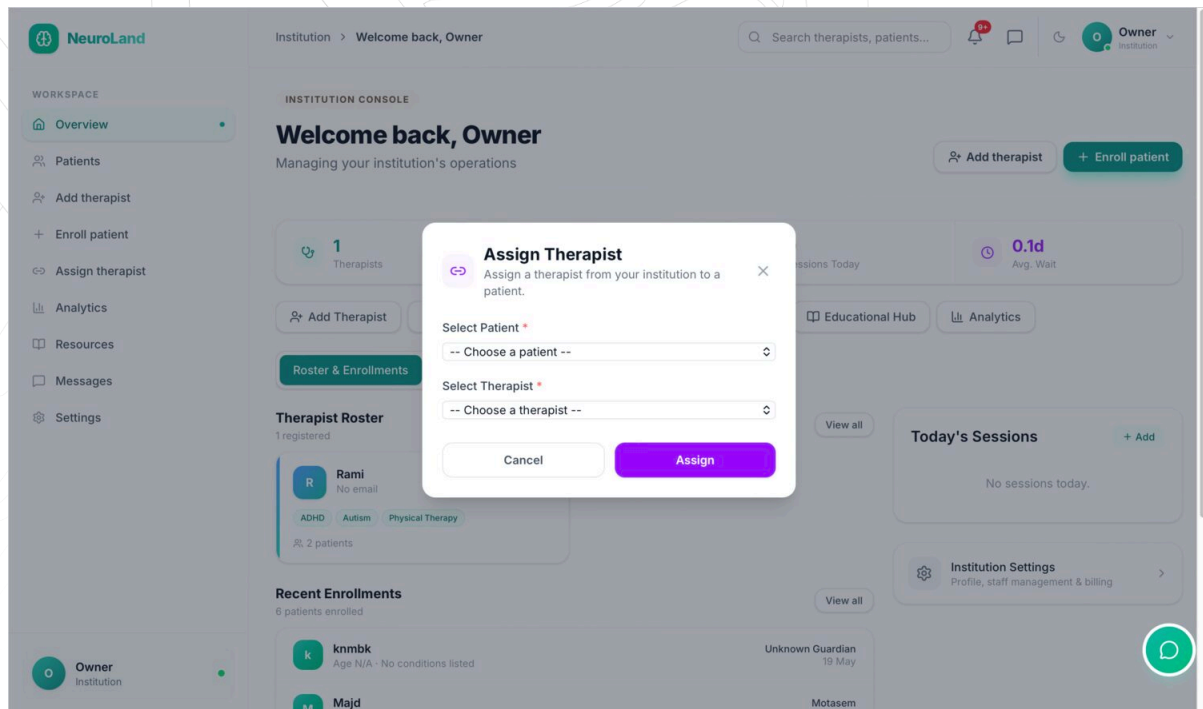
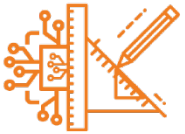


Figure 40: Assign-therapist dialog matching a patient to a therapist.

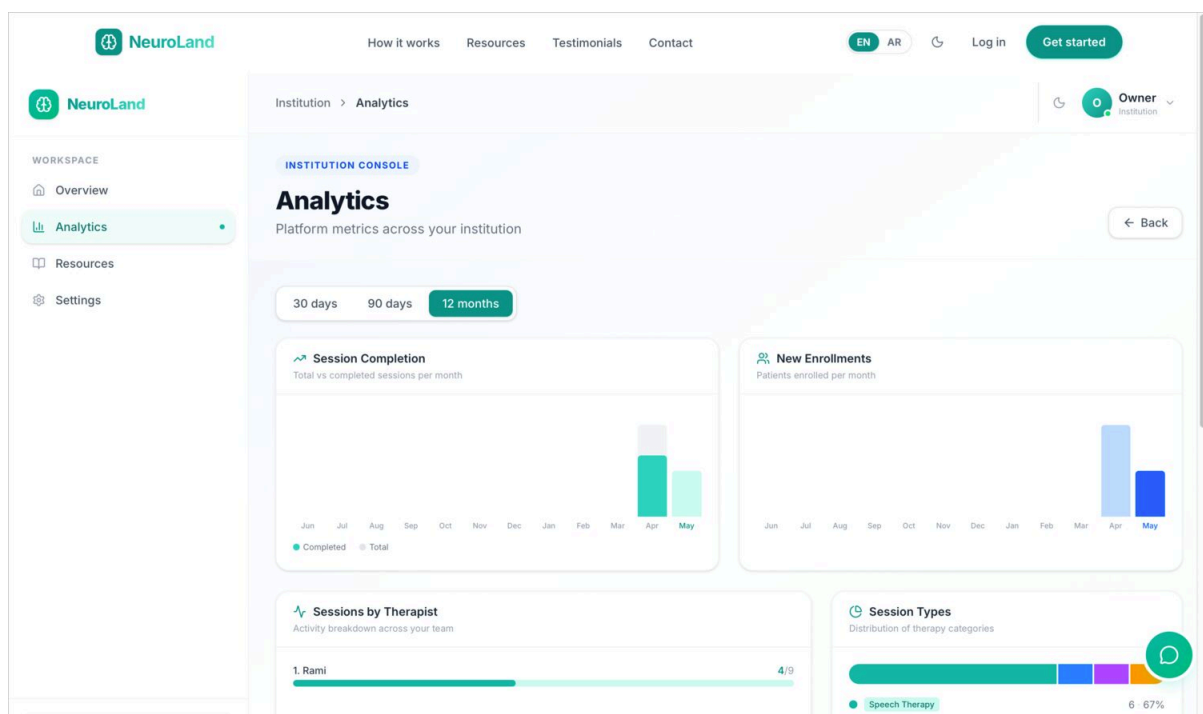


Figure 41: Institution analytics — session completion, enrolments, and session types.



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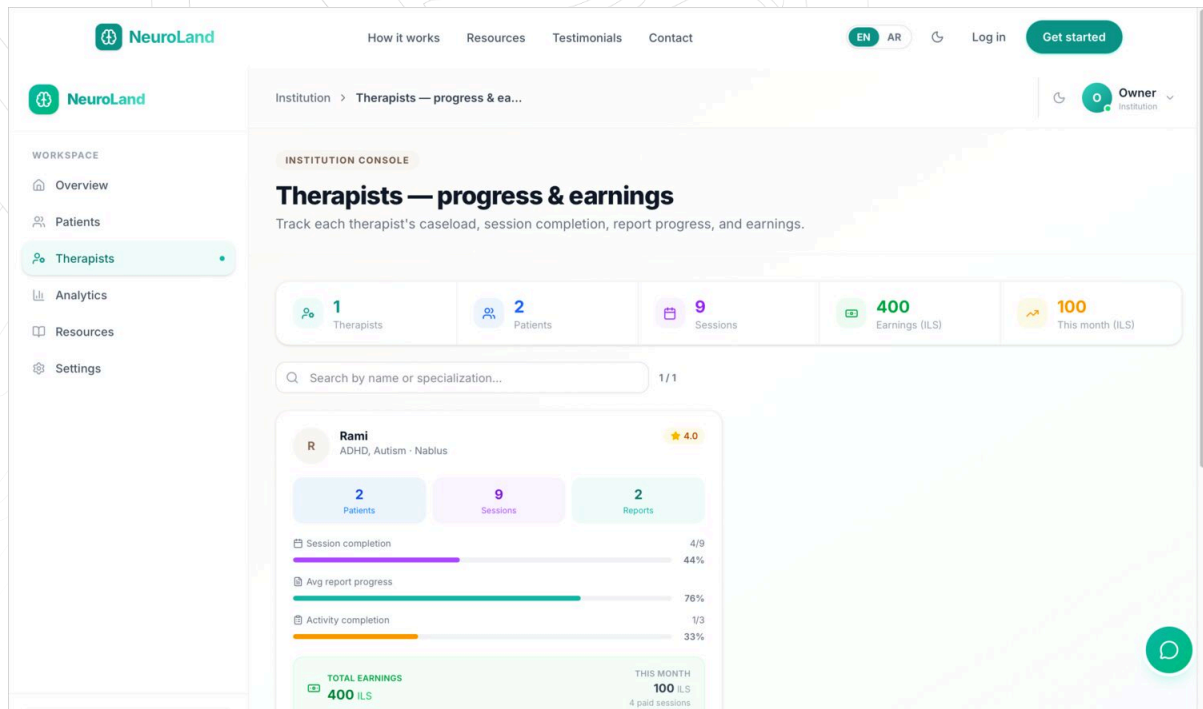
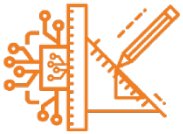


Figure 42: Per-therapist progress and earnings overview.

E. Therapist Workspace

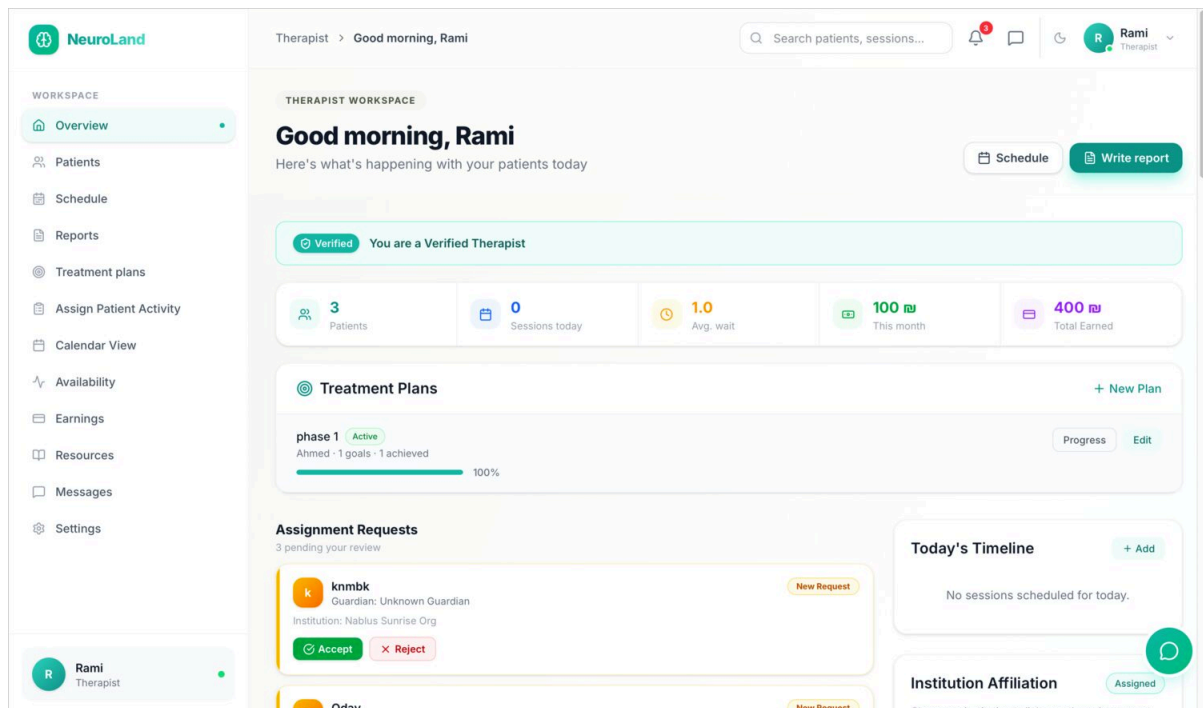


Figure 43: Therapist dashboard with verified badge, treatment plans, and the day's timeline.



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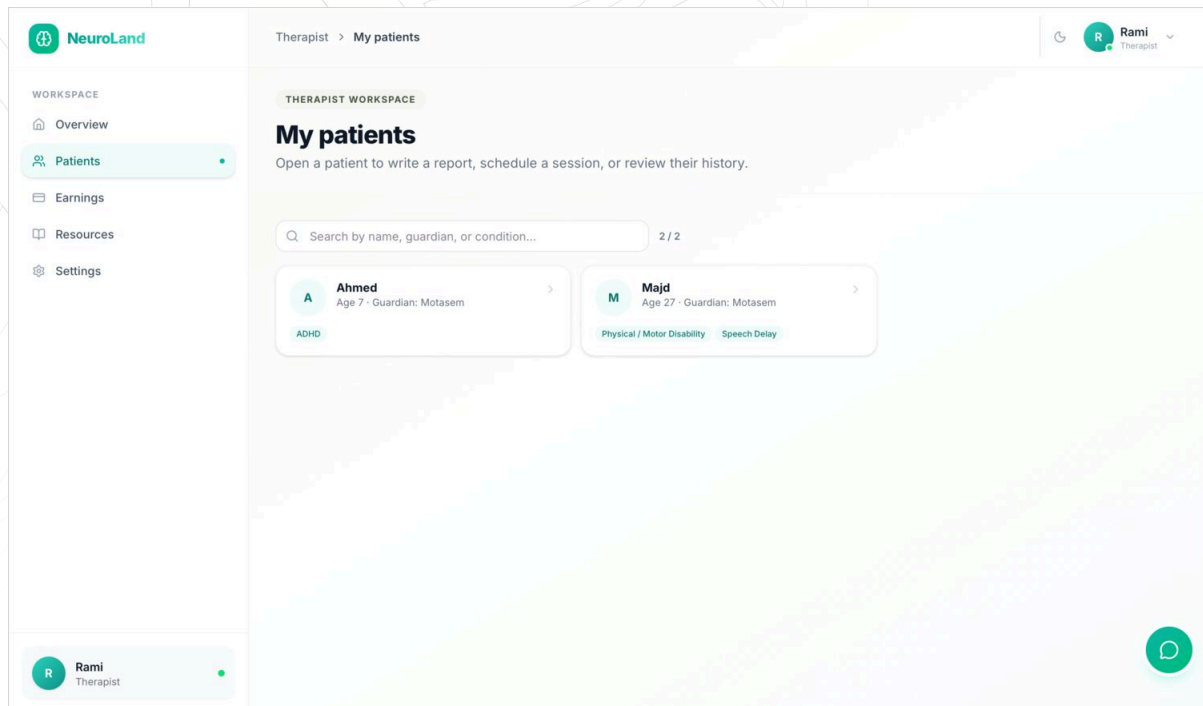
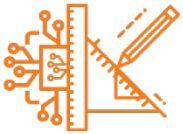


Figure 44: List of patients assigned to the therapist.

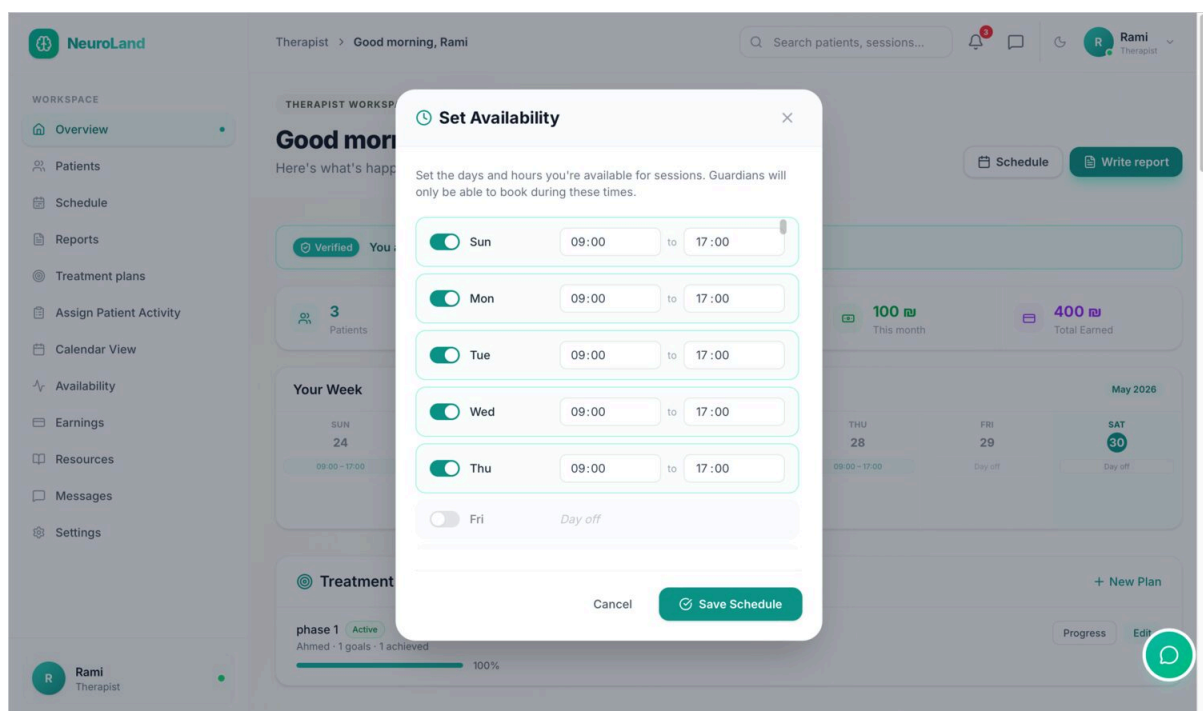


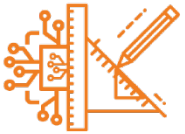
Figure 45: Weekly availability editor.



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The screenshot shows the 'Schedule Session' dialog box in the NeuroLand app. The dialog is overlaid on the main interface, which includes a sidebar with navigation options like Overview, Patients, Schedule, Reports, Treatment plans, Assign Patient Activity, Calendar View, Availability, Earnings, Resources, Messages, and Settings. The main content area shows a 'Good morning, Rami' greeting and a 'Schedule Session' button. The dialog box has a title bar with a close button. It contains a 'Select Patient' dropdown, a 'Therapy Type' dropdown set to 'Speech Therapy', a 'Date' field set to '29/05/2026', a 'Time' field set to '09:00', a 'Duration (mins)' field set to '60', and a 'Status' dropdown set to 'Pending'. There is a checkbox for 'Repeat weekly' with a note 'Demo-friendly recurring sessions. Conflicts are checked before creation.' At the bottom of the dialog are 'Cancel' and 'Save Session' buttons.

Figure 46: Schedule-session dialog for creating an available slot.

The screenshot shows the 'Write Session Report' dialog box in the NeuroLand app. The dialog is overlaid on the main interface. It has a title bar with a close button. The dialog contains a 'Session' dropdown, a 'Report Title' text field, a 'Therapist Summary' section with a 'Draft with AI' button and a text area containing 'Clinical observations, session highlights, milestones...', a 'Therapist Notes (raw, optional — used to draft summaries with AI)' section with a text area containing 'Quick raw notes the AI can shape into a polished summary.', a 'Patient Mood' section with a 'Neutral' selection and a 'Progress (%)' slider set to 50%, a 'Treatment Goals' section with a 'Goal description' text field and an 'In Progress' status dropdown, and a 'Recommendations' section with a text area containing 'Practice ideas, follow-ups, suggested resources.' At the bottom right of the dialog is a 'Save Report' button.

Figure 47: Write-session-report editor.

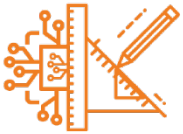


Figure 48: AI-assisted report drafting with a parent-friendly summary.

Figure 49: Create-treatment-plan dialog with goals, milestones, and review cadence.

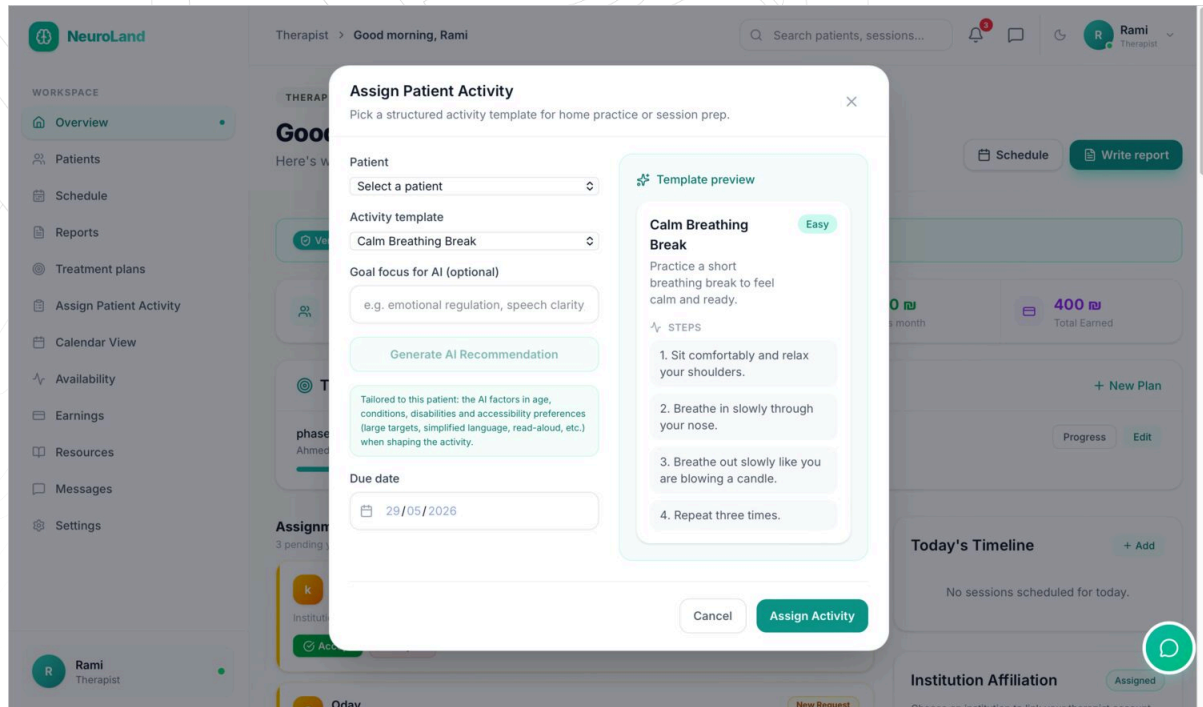
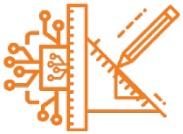


Figure 50: Assign-activity dialog with a guided template preview.

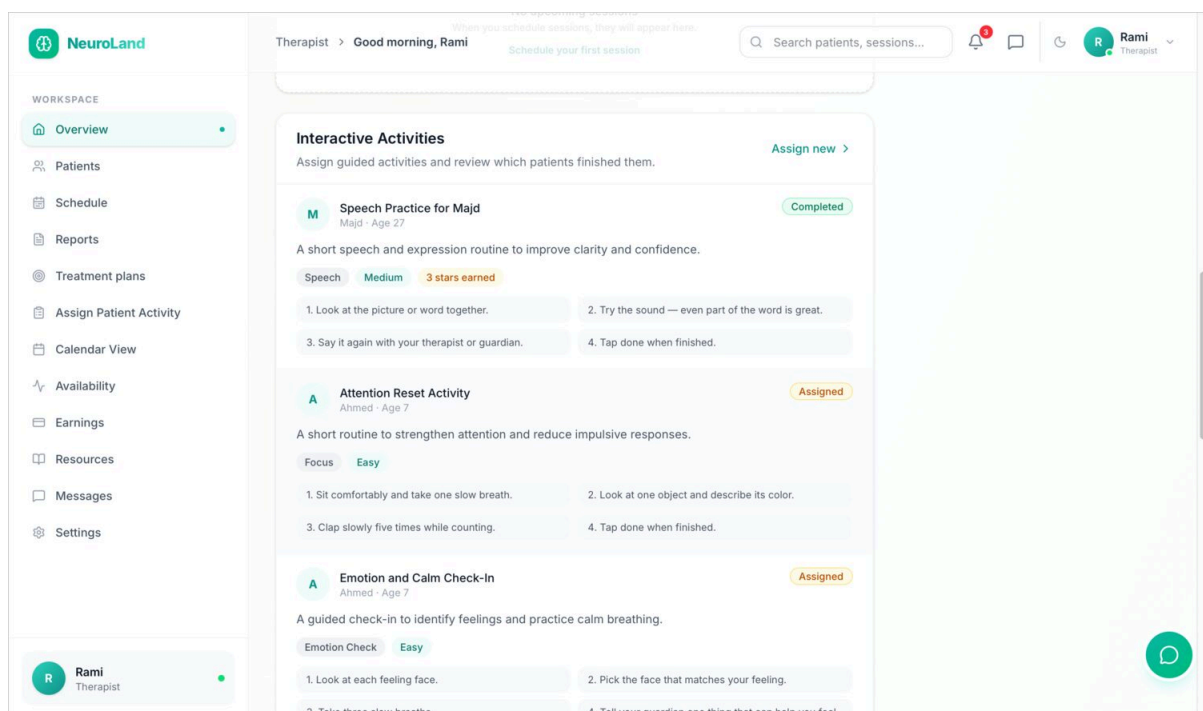


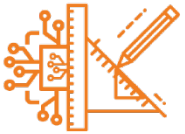
Figure 51: Library of interactive activities that can be assigned to a patient.



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PATIENT	DATE & TIME	TYPE	STATUS	PAYMENT	DETAILS
A Aseel Age 9	27 May 2026 - 16:00	Speech Therapy	Pending	Unpaid	Open
M Majd Age 27	9 May 2026 - 09:00	Speech Therapy	Confirmed	Unpaid	Open
M Majd Age 27	8 May 2026 - 09:00	Occupational Therapy	Confirmed	Unpaid	Open
A Ahmed Age 7	26 Apr 2026 - 09:00	Speech Therapy	Completed	Unpaid	Open
A Ahmed Age 7	21 Apr 2026 - 10:00	Behavioral Therapy	Confirmed	Paid	Open
A Ahmed Age 7	19 Apr 2026 - 15:00	Speech Therapy	Active	Unpaid	Open
A Ahmed Age 7	19 Apr 2026 - 11:00	Speech Therapy	Completed	Paid	Open
A Ahmed Age 7	19 Apr 2026 - 09:00	Autism Assessment	Completed	Paid	Open

Figure 52: Past-sessions history with status and payment state.

GUARDIAN	SESSIONS	TOTAL
Motasem	4	400 ILS

PATIENT	DATE & TIME	TYPE	STATUS	PAYMENT
Motasem	19 Apr - Visa/MC - 09/05/2026	Speech Therapy	Paid	100 ILS
Motasem	21 Apr - Visa/MC - 23/04/2026	Behavioral Therapy	Paid	100 ILS
Motasem				100 ILS

Figure 53: Earnings dashboard with payment history and income breakdown.



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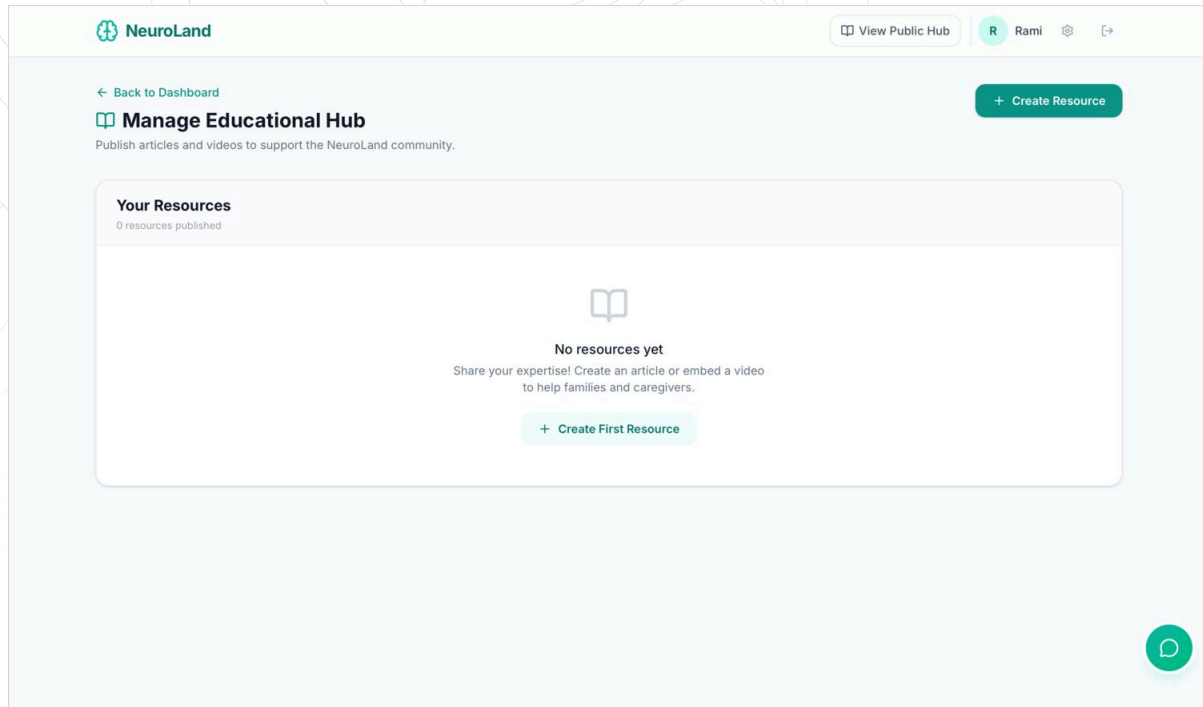
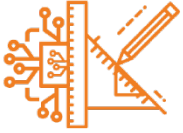


Figure 54: Educational-hub resource management for therapists.

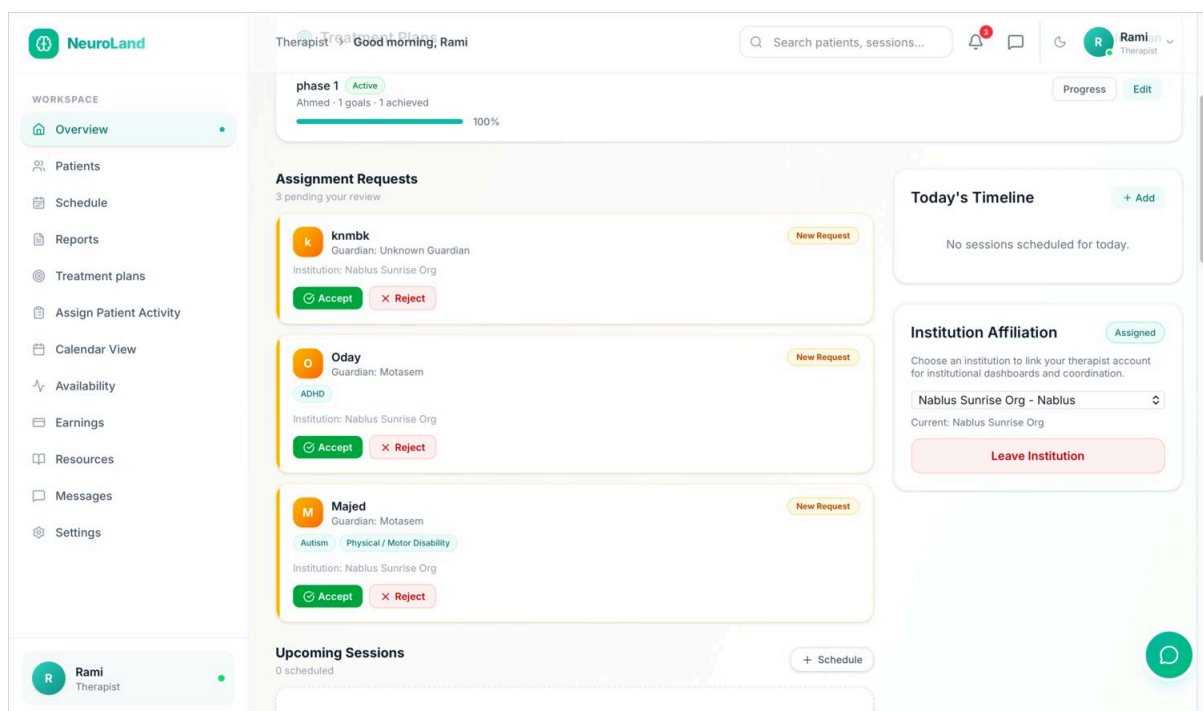


Figure 55: Assignment requests and institution-affiliation controls.

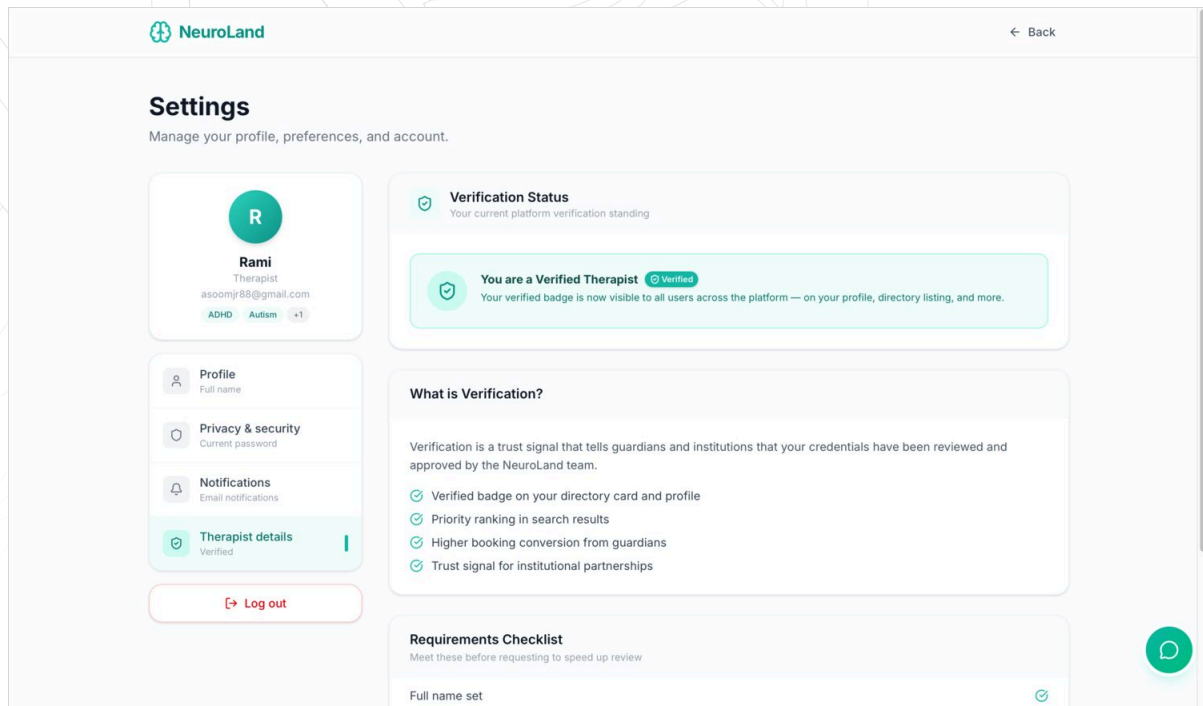
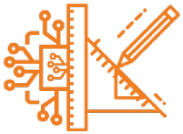


Figure 56: Therapist settings — verification status and requirements checklist.

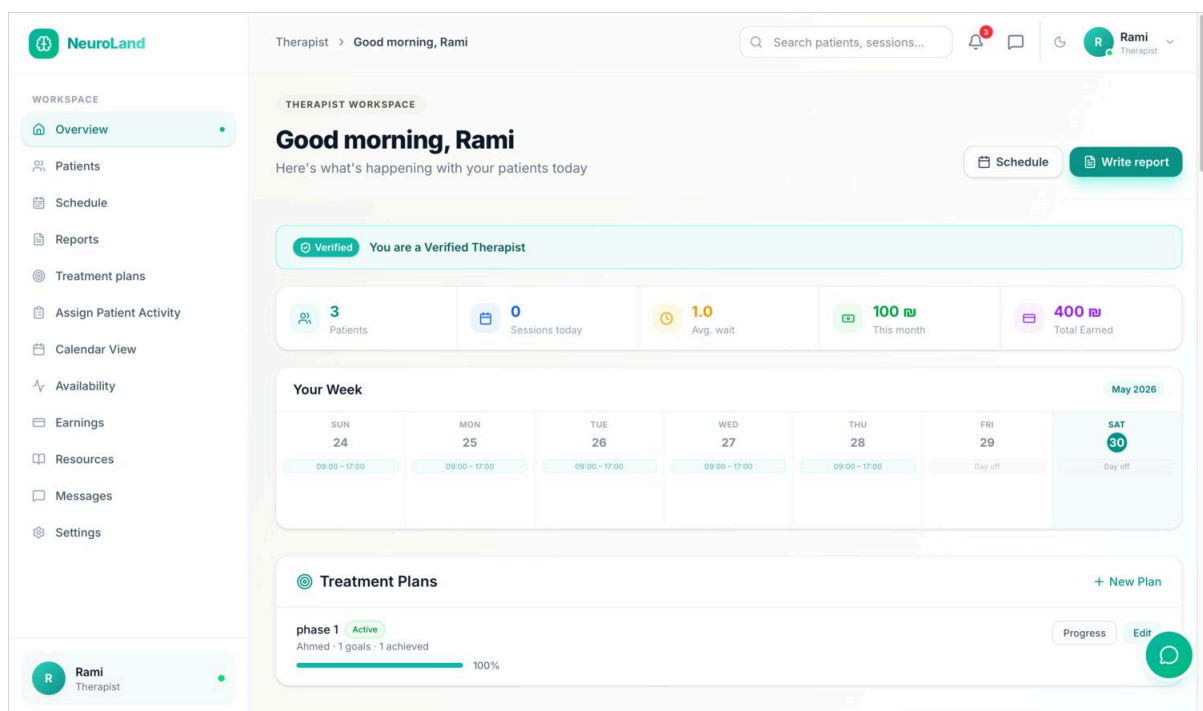
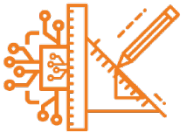


Figure 57: Therapist weekly-summary statistics on the dashboard.



F. Guardian Portal

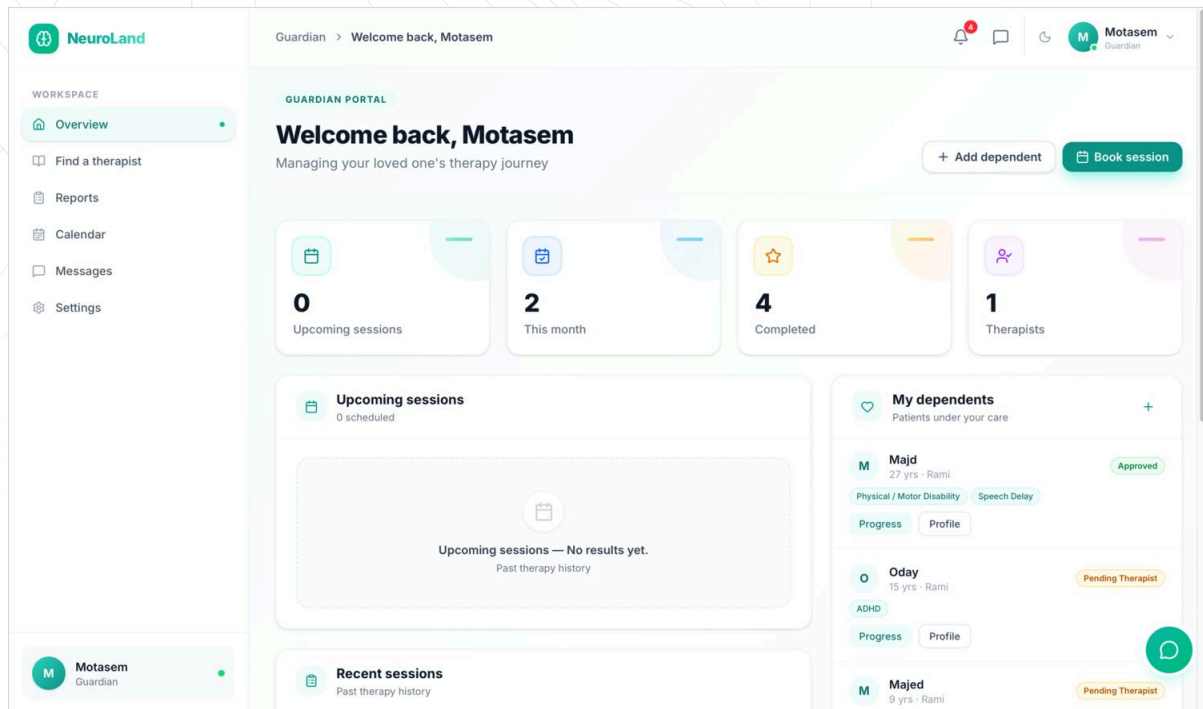


Figure 58: Guardian dashboard summarising upcoming sessions and dependents.

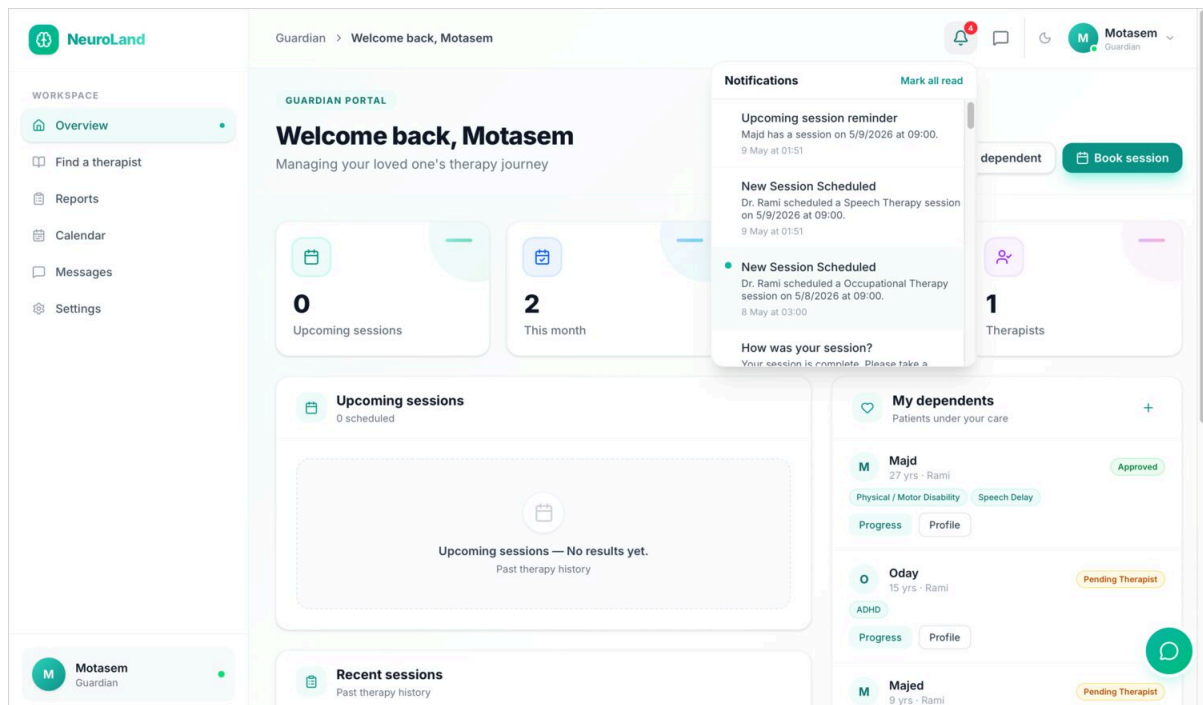


Figure 59: Notifications panel showing session and care updates.



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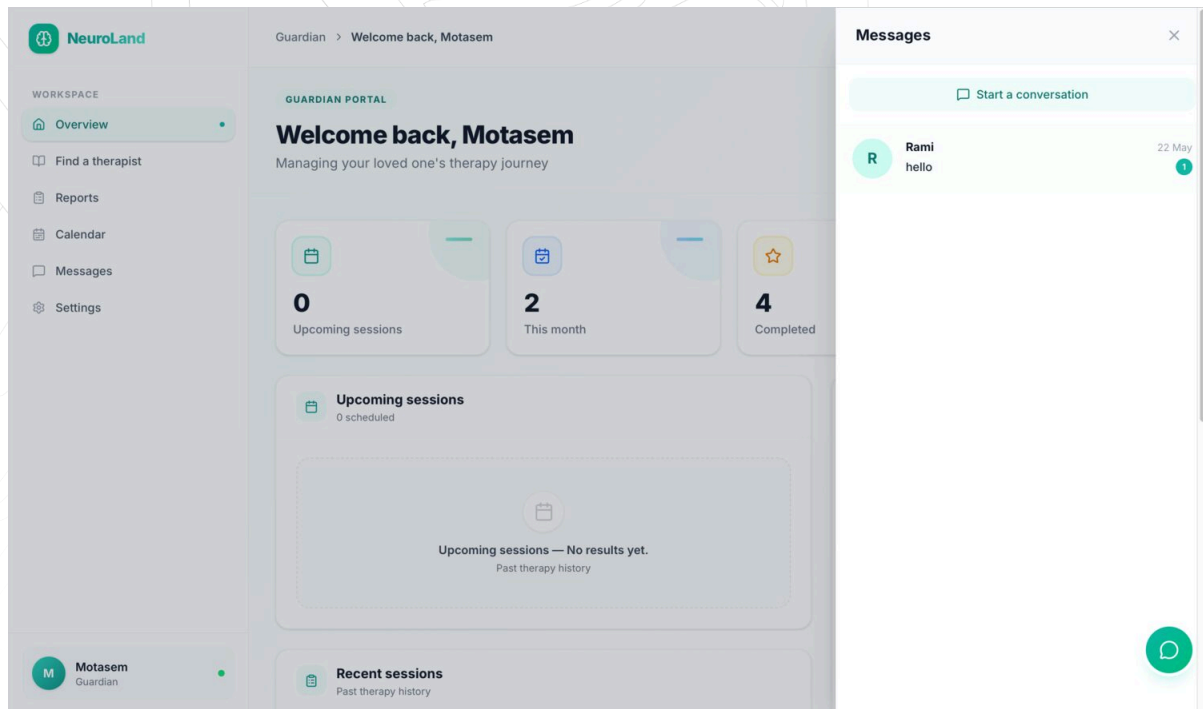
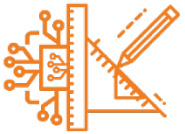


Figure 60: In-app messaging panel for contacting therapists.

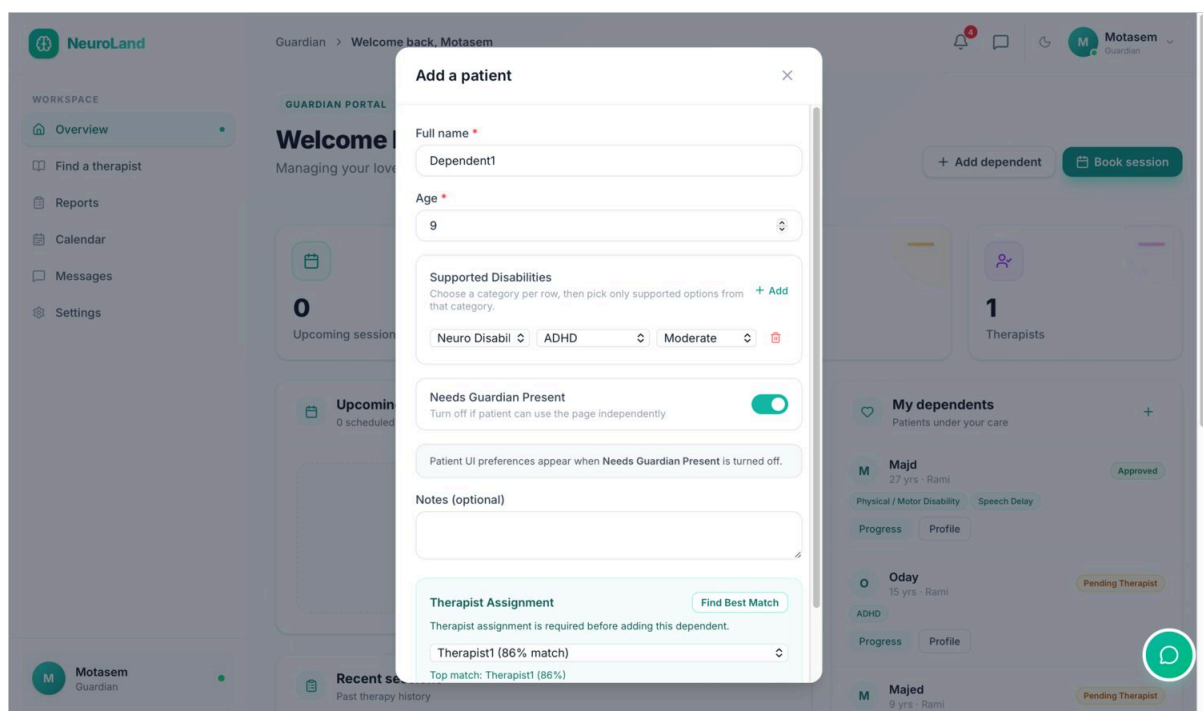


Figure 61: Add-a-dependent dialog capturing disabilities and conditions.



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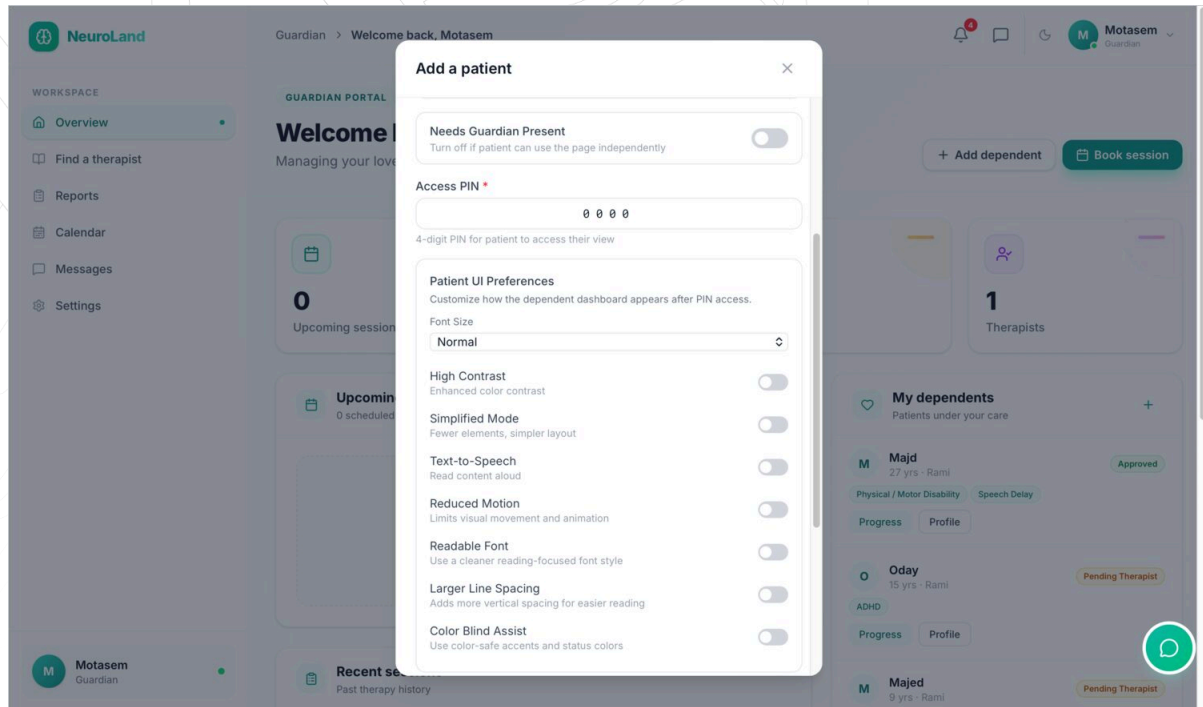
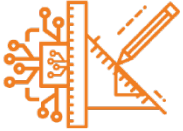


Figure 62: Dependent accessibility preferences and PIN setup.

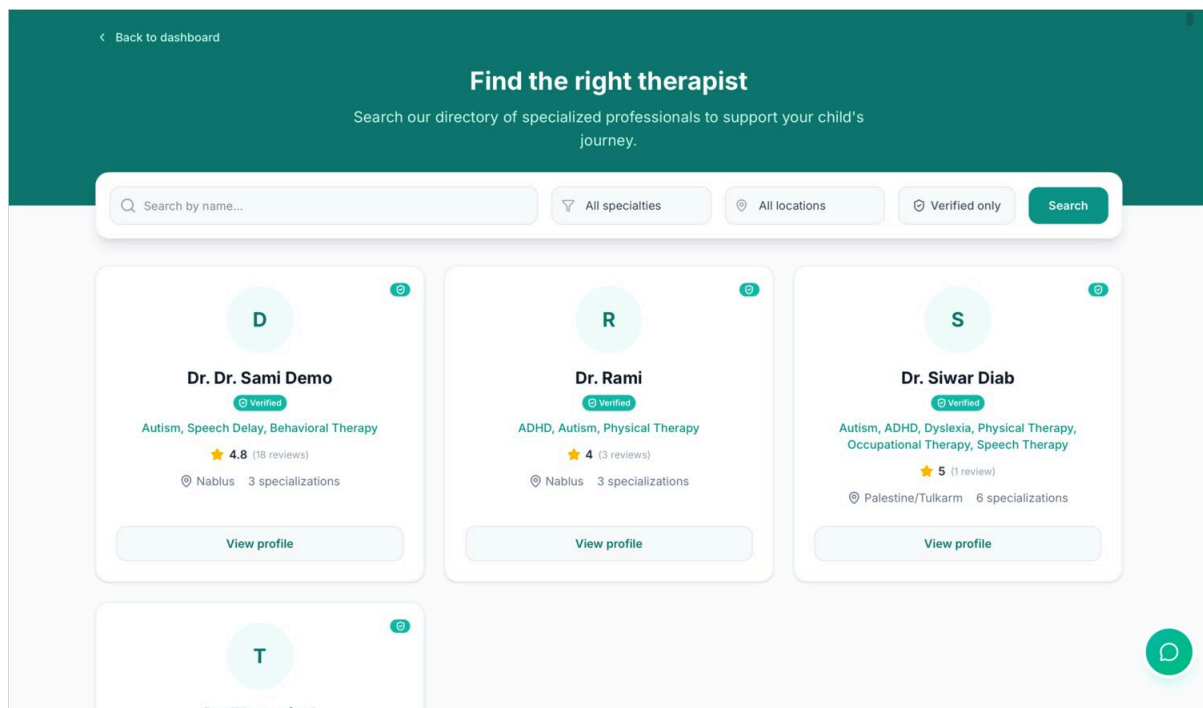


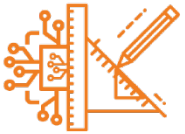
Figure 63: Therapist directory with specialisation and location filters.



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NeuroLand Guardian > Welcome back, Motasem

Book a Session

Therapist
Choose a therapist...

Patient
Choose a patient...

Therapy Type
Speech Therapy

Date
29/05/2026

Time
Choose a therapist...

Duration (mins)
60

Notes for therapist (optional)
Anything the therapist should know before the session.

Cancel Request Session

Figure 64: Book-a-session dialog.

NeuroLand Guardian > Welcome back, Motasem

Session calendar

May 2026

Sun	Mon	Tue	Wed	Thu	Fri	Sat
26	27	28	29	30	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31	1	2	3	4	5	6

Figure 65: Session calendar for a dependent.

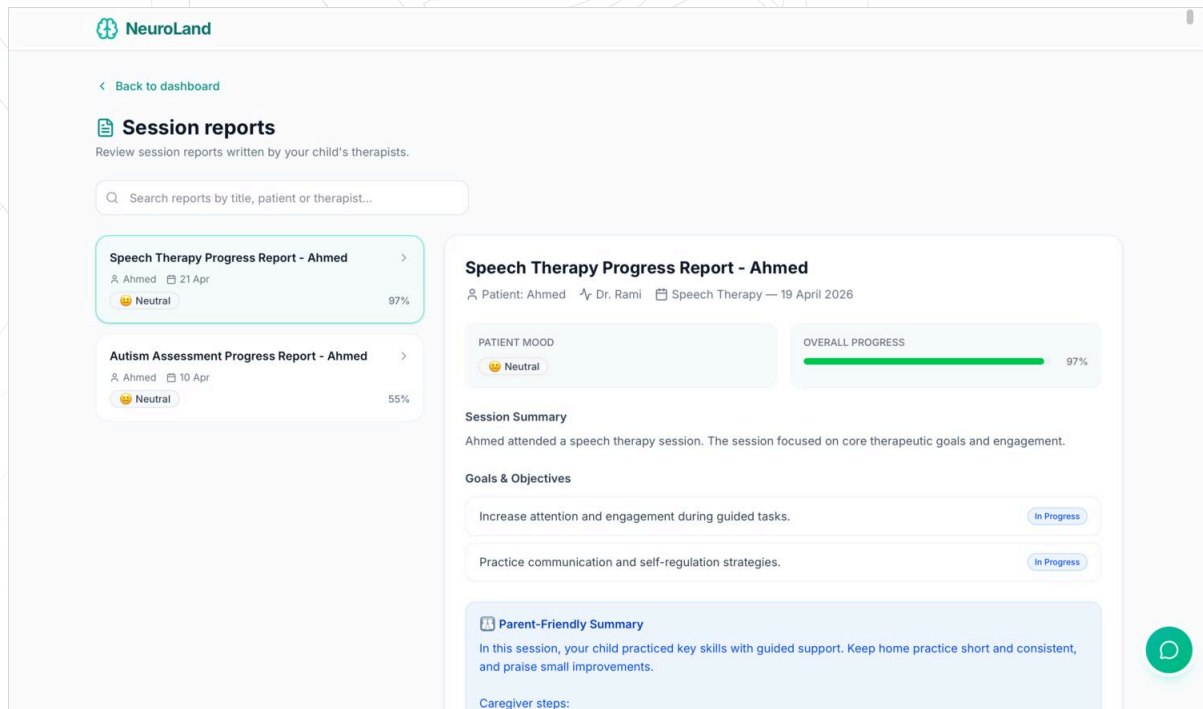
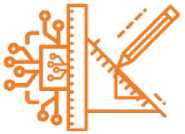


Figure 66: Session report with goals and a parent-friendly summary.

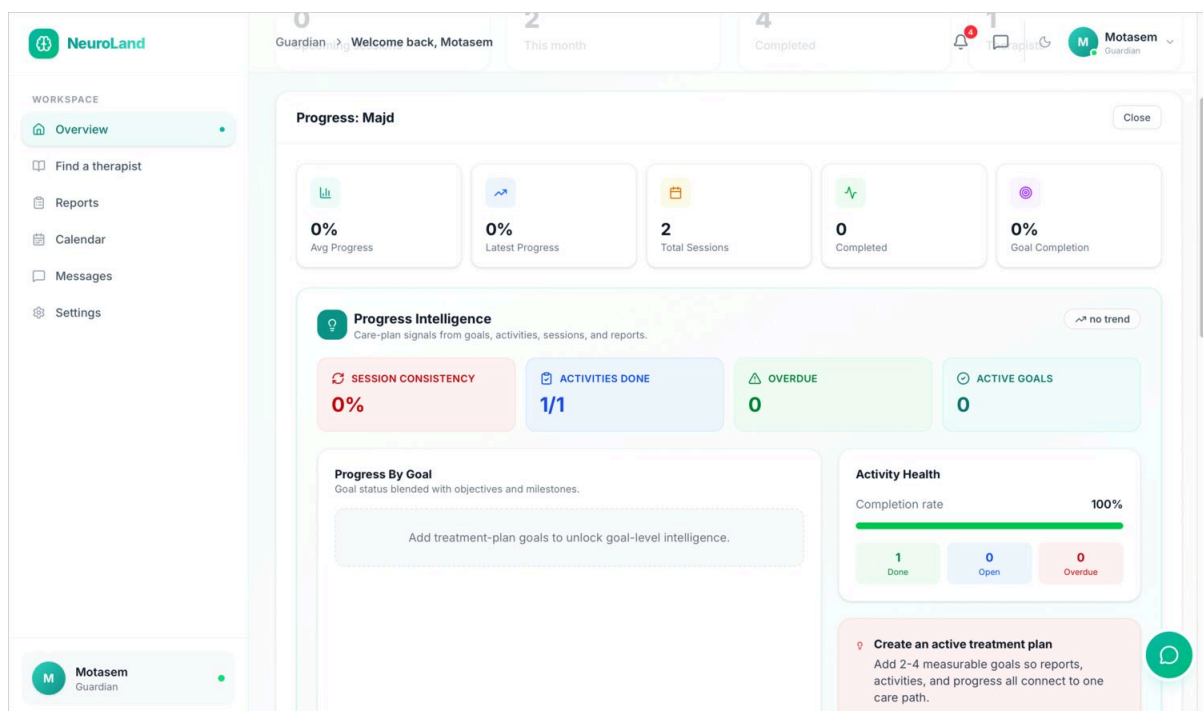


Figure 67: Progress Intelligence panel rolling up goals, activities, and consistency.

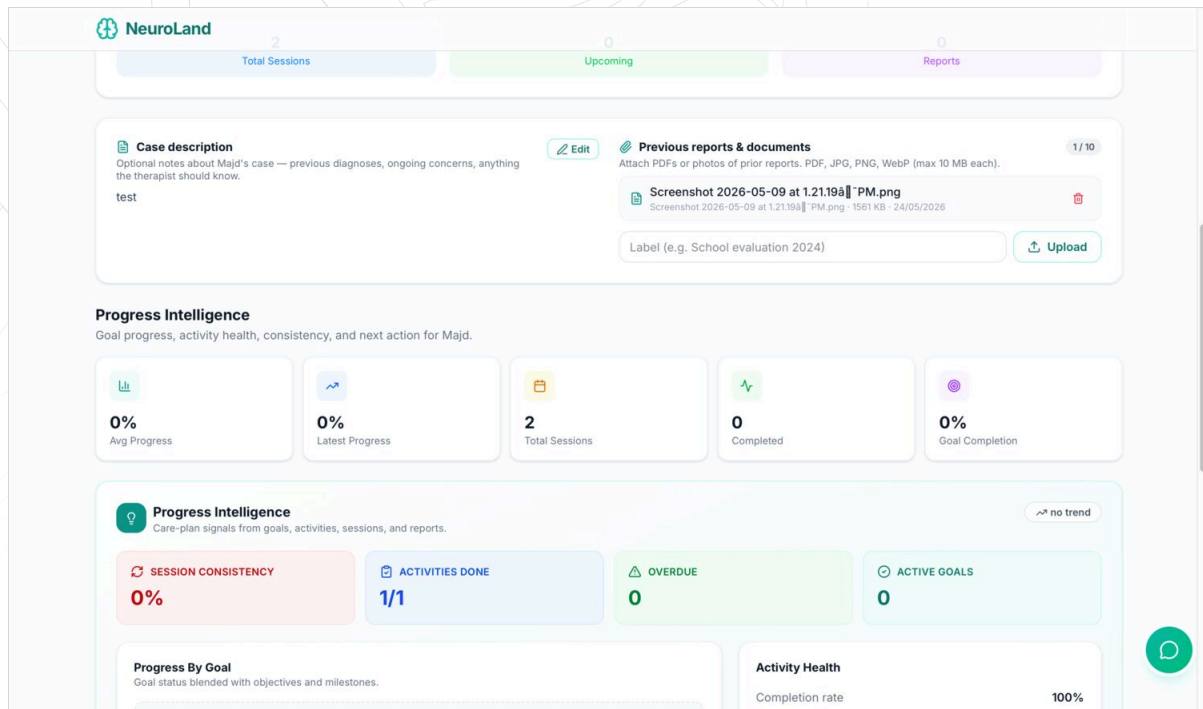
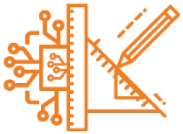


Figure 68: Dependent detail — case description and report history.

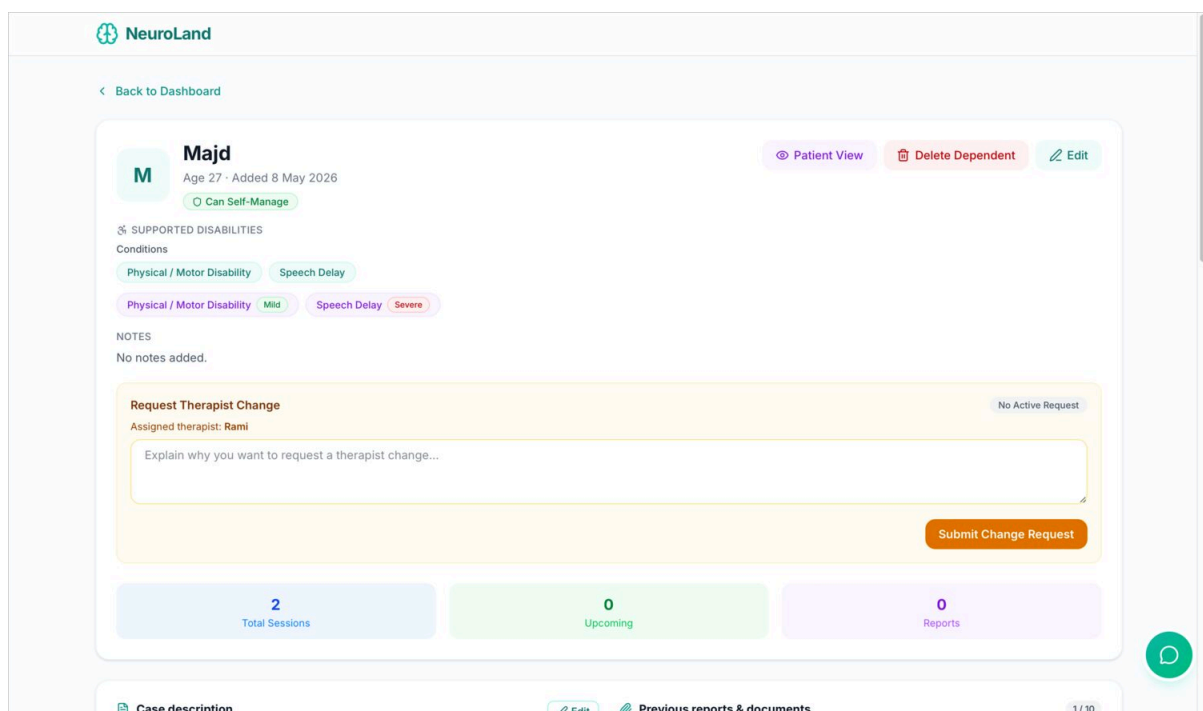


Figure 69: Dependent profile with change and deletion requests.



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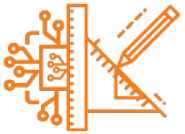


Figure 70: Recent-sessions history across the guardian's therapists.

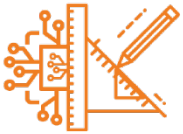
Figure 71: Treatment-plan and sessions empty state for a new dependent.



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NeuroLand

← Back

Settings

Manage your profile, preferences, and account.

Profile

Privacy & security

Notifications

Log out

Personal Information

Your basic profile details

Full name

Motasem

Email Address

mojararah@gmail.com

Email cannot be changed

Phone number

+972 000 000 000

City

Save Changes

Figure 72: Guardian settings — personal information.

NeuroLand

← Back

Settings

Manage your profile, preferences, and account.

Profile

Privacy & security

Notifications

Log out

Change Password

Keep your account secure

Current password

Enter current password

New password

min. 8 characters

Confirm new password

Re-enter new password

Password requirements

- At least 8 characters
- Contains uppercase letter
- Contains a number

Update Password

Figure 73: Change-password screen.



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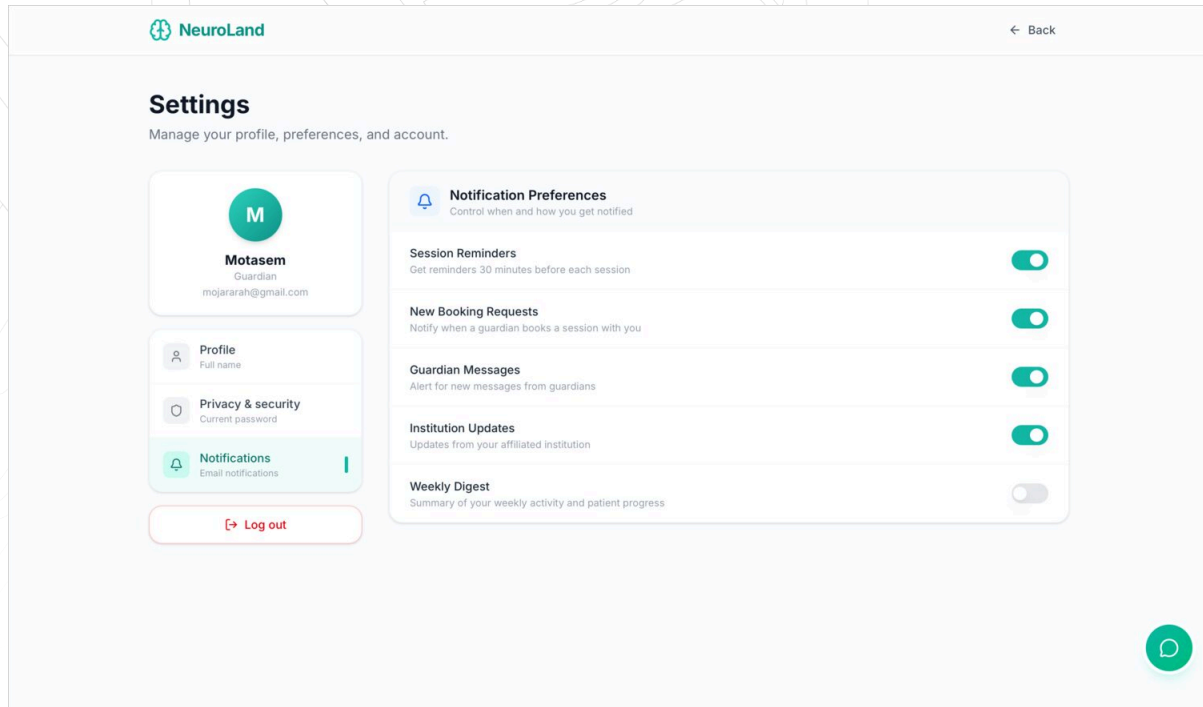
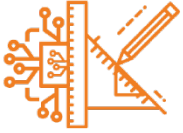


Figure 74: Notification-preference toggles.

G. Patient (Child) Interface

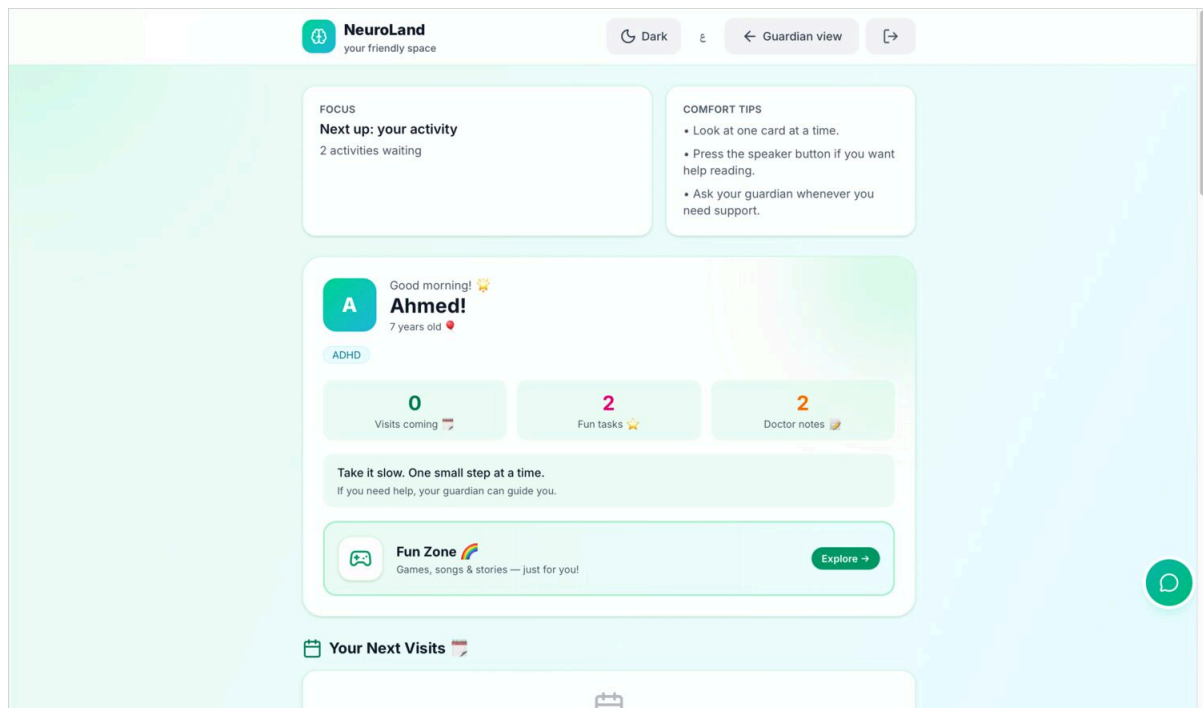


Figure 75: Simplified, PIN-based patient home designed for a child.

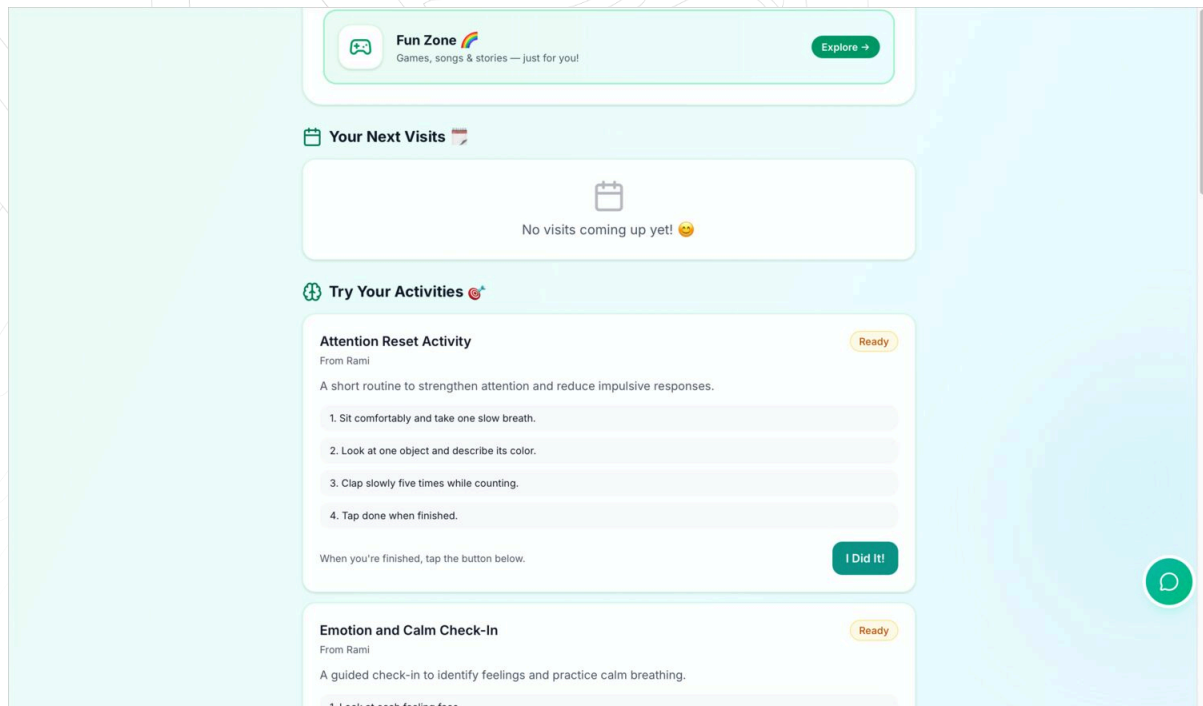
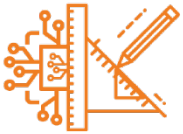


Figure 76: Assigned activities for the child to complete.

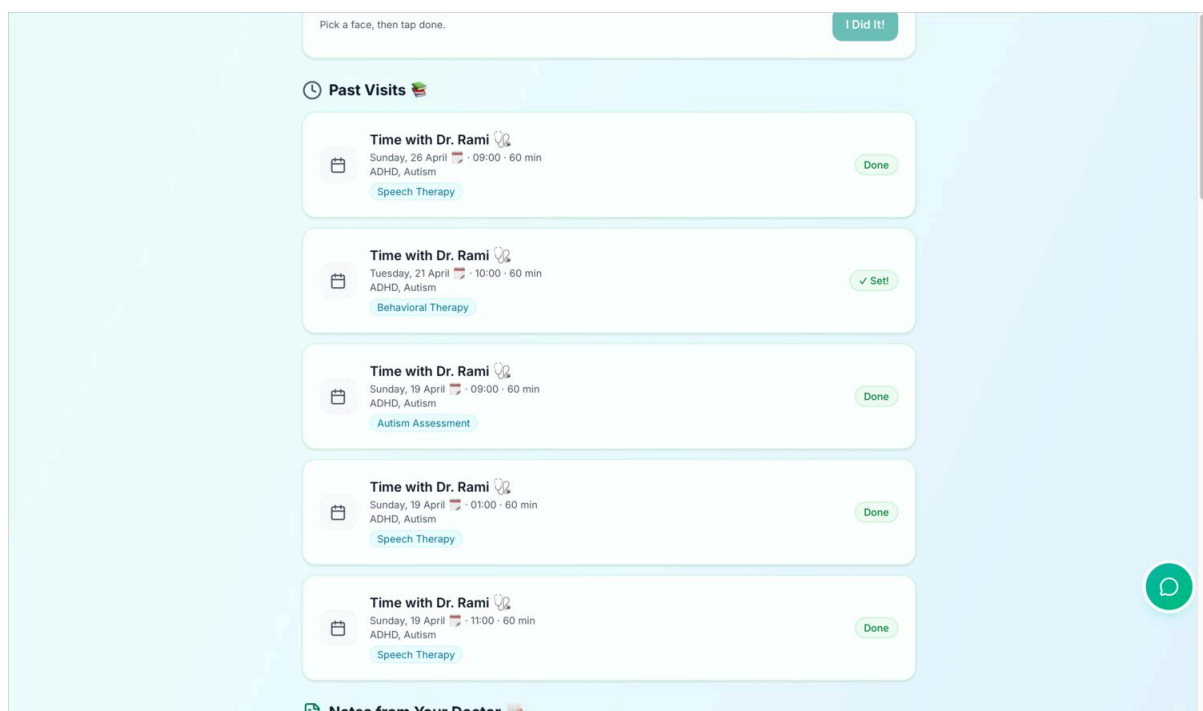


Figure 77: Past visits and notes from the therapist.



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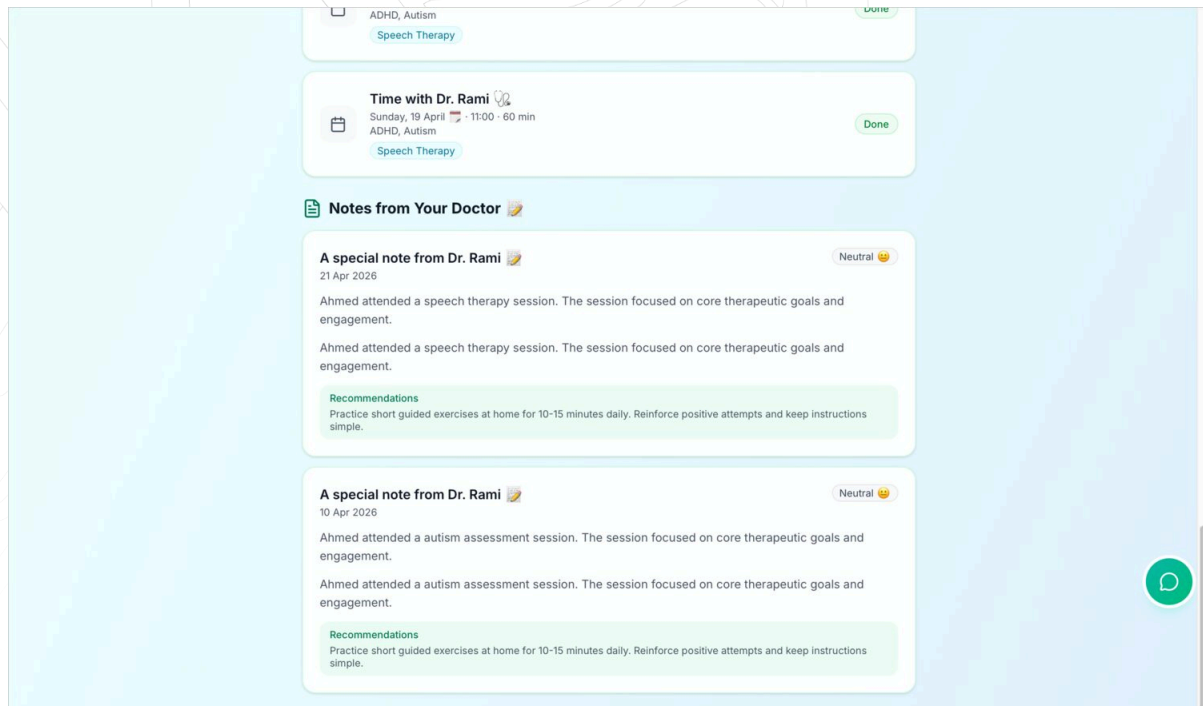
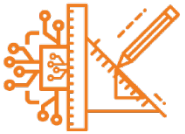


Figure 78: Doctor's notes rewritten in plain, child-friendly language.

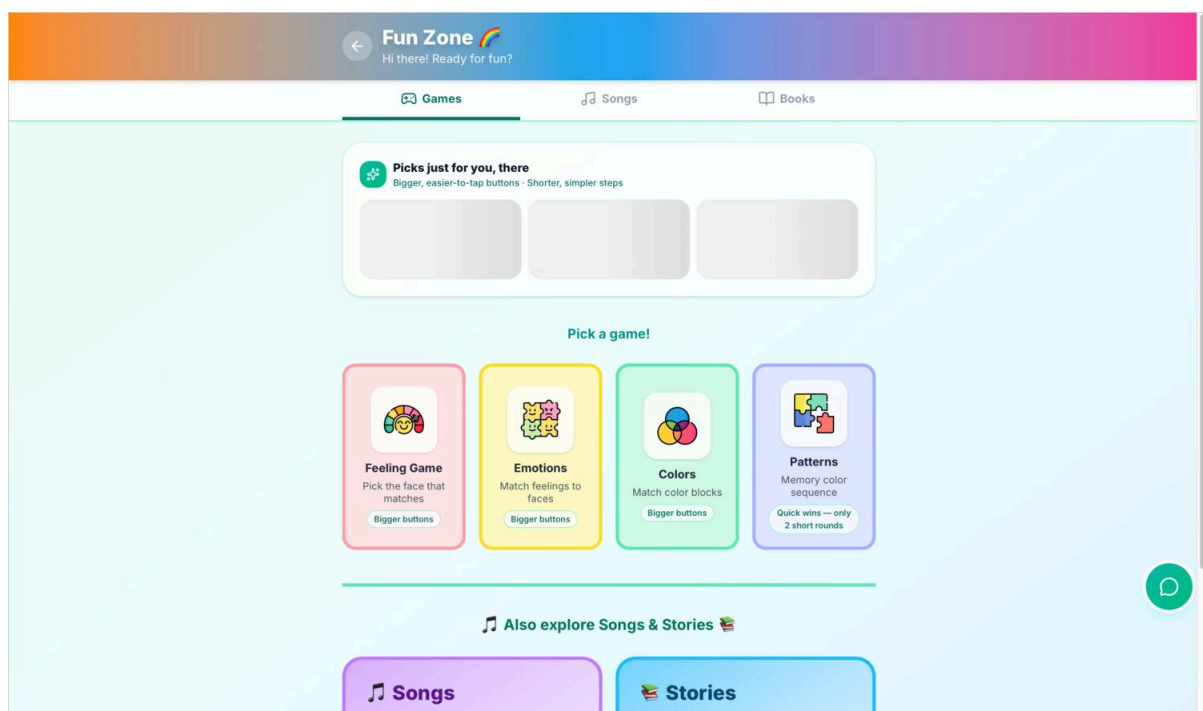


Figure 79: Fun Zone — therapeutic games.

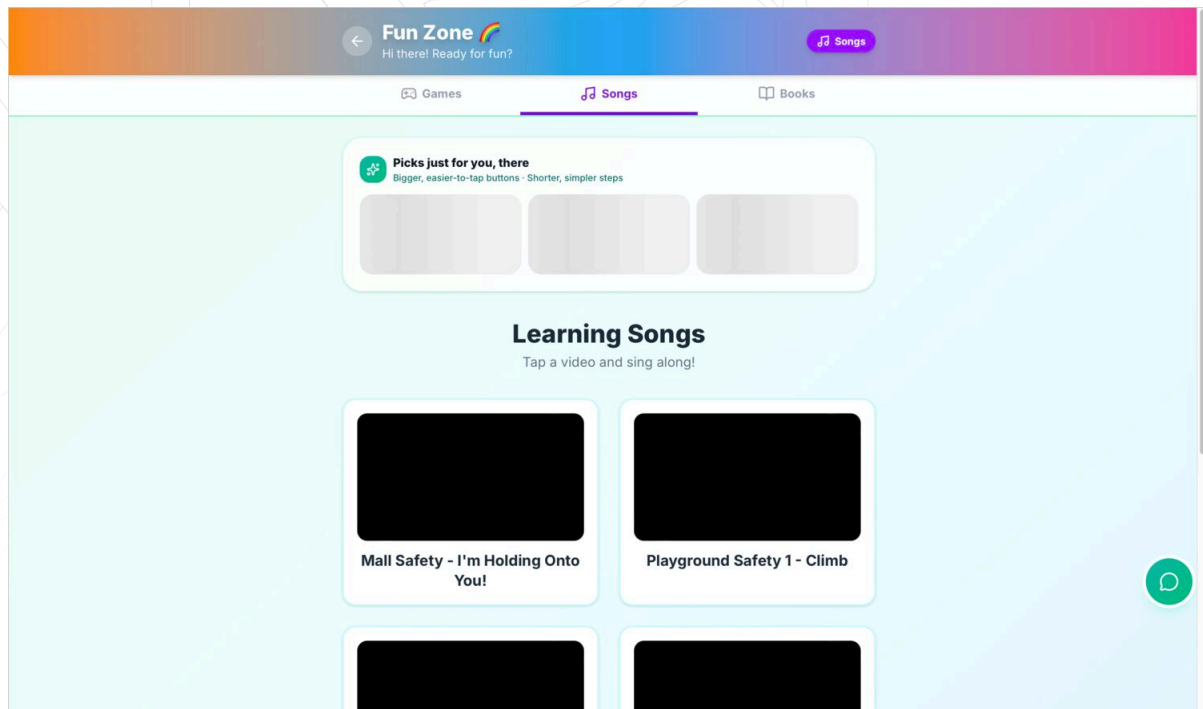
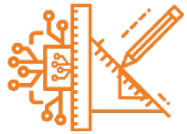


Figure 80: Fun Zone — learning songs.

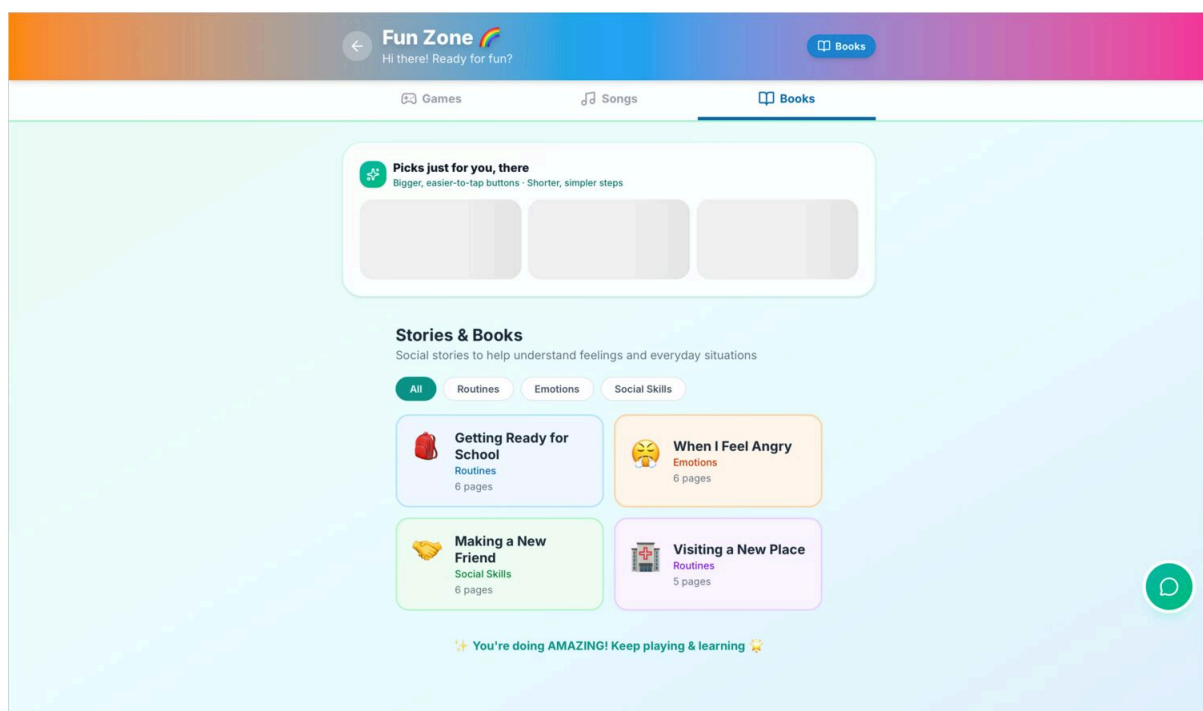
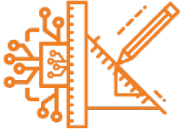


Figure 81: Fun Zone — social-story books.



3.14 System Walkthrough (Mobile)

The Expo / React Native mobile application mirrors the core workflows on a phone. The screenshots below are arranged two to a row to conserve space and follow the same role-based order: authentication and onboarding, then the guardian, therapist, and institution applications. Figure numbering continues from the web walkthrough.

A. Authentication and Onboarding

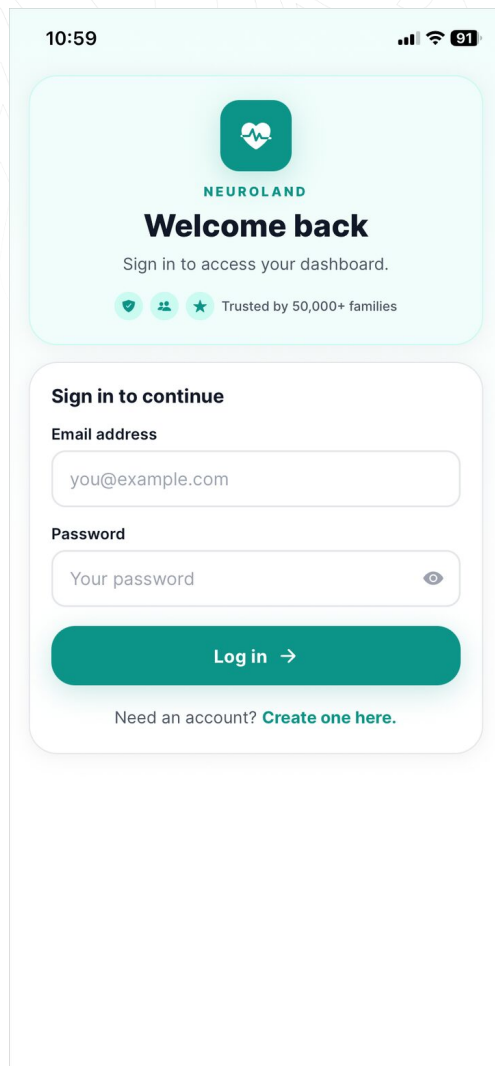


Figure 82: Login screen for signing in to the dashboard.

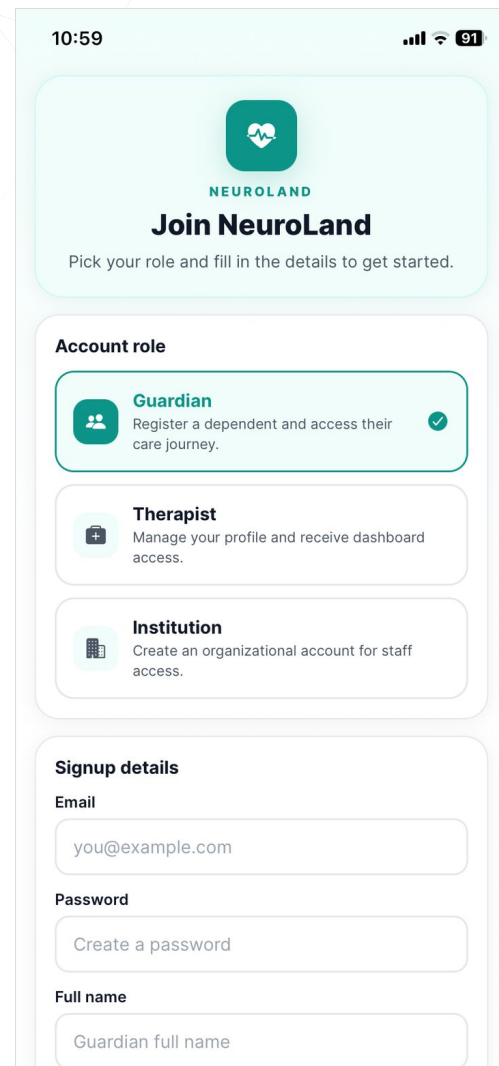


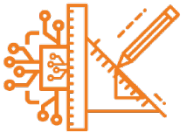
Figure 83: "Join NeuroLand" role selection with the guardian role chosen.



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11:00

NEUROLAND

Join NeuroLand

Pick your role and fill in the details to get started.

Account role

- Guardian**
Register a dependent and access their care journey.
- Therapist** (Selected)
Manage your profile and receive dashboard access.
- Institution**
Create an organizational account for staff access.

Signup details

Email
you@example.com

Password
Create a password

Full name
Therapist full name

Figure 84: Sign-up role selection with the therapist role chosen.

you@example.com

11:00

Password
Create a password

Full name
Therapist full name

Phone
05xxxxxxxx

City
City

License number
e.g. TH-12345-5
Format: TH-NNNNN-C (5 digits + check digit)

Specializations
Select the areas you are qualified to provide. 0 selected
Choose specializations [Choose >](#)

Experience
Years or short description

Affiliation
Clinic or institution

[Create account →](#)

Already have an account? [Go back to login.](#)

Figure 85: Therapist sign-up details — license, specialisations, experience, and affiliation.



11:09 88%

Verify your email

We sent a 6-digit code to s12112082@stu.najah.edu.

We emailed you a 6-digit code.

Verify and continue

[Resend code](#) [Back to login](#)

Role: institution - The code expires in 10 minutes.

From Gmail
632587

1 2 3
4 5 6
7 8 9
0

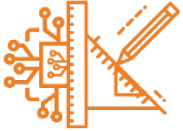
Figure 86: Six-digit email verification (one-time code) during sign-up.



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B. Guardian Application

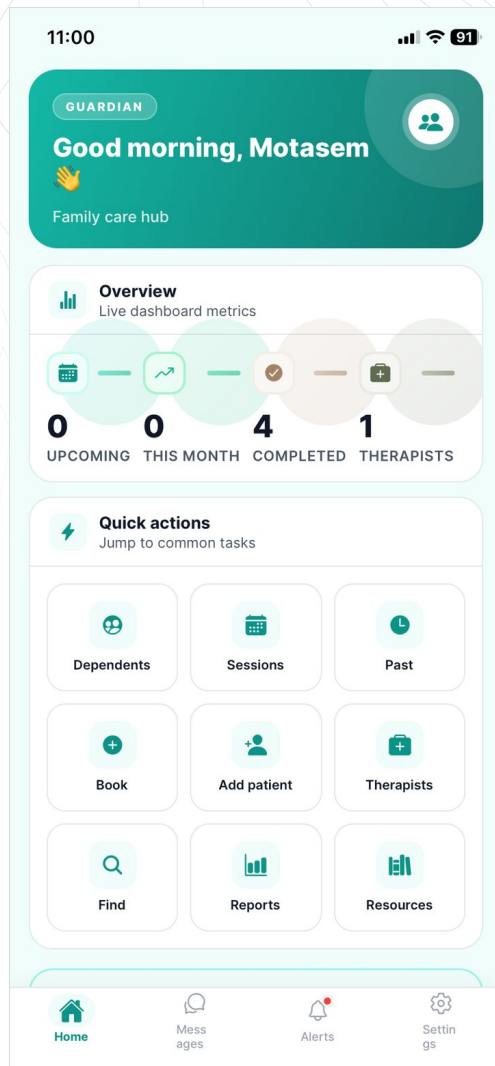


Figure 87: Guardian dashboard with overview metrics and quick actions.

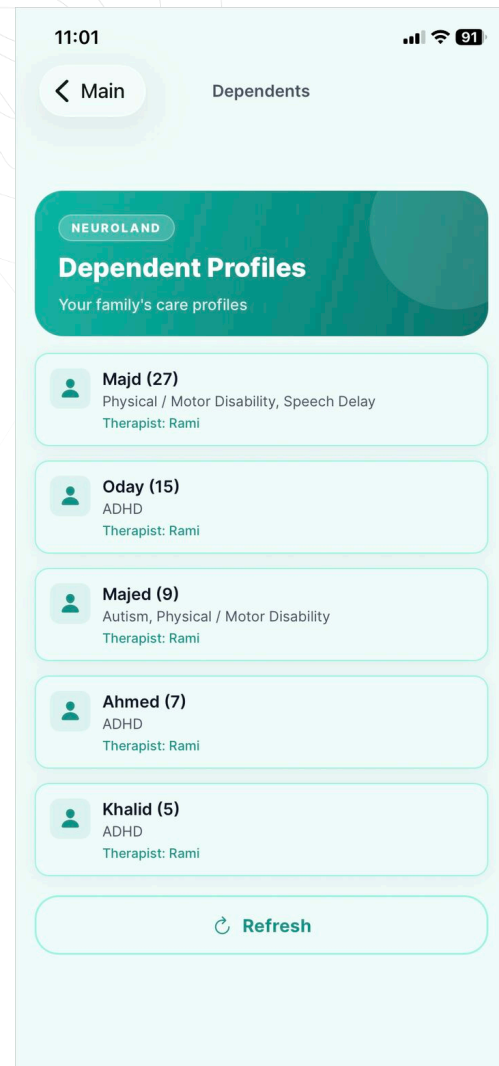


Figure 88: Dependent-profiles list for the guardian's children.



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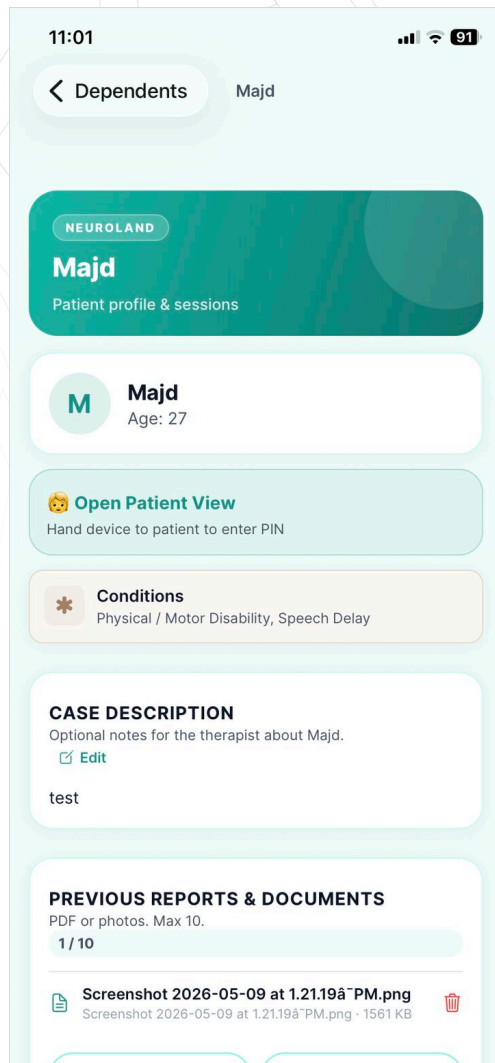
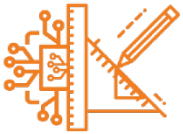


Figure 89: Dependent detail with conditions, case description, and previous reports.

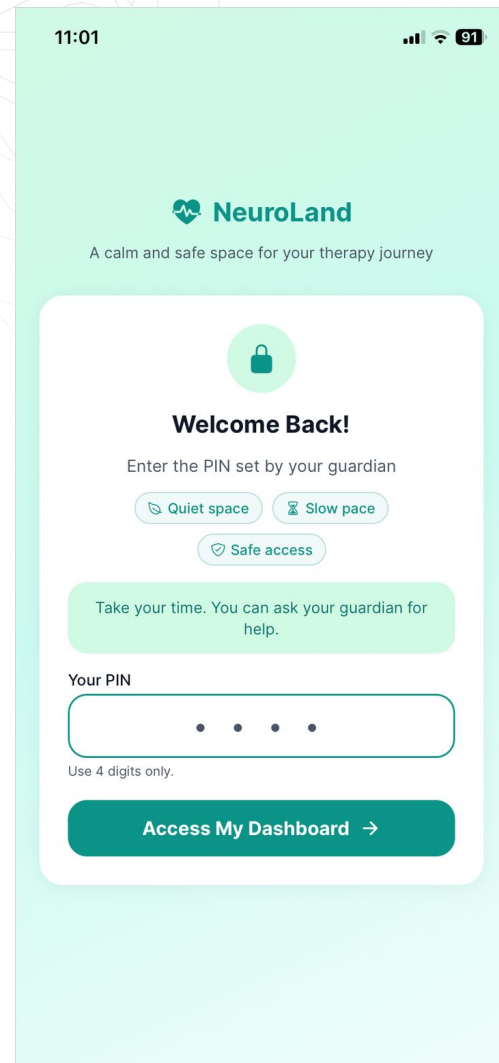


Figure 90: PIN entry used to open a dependent's patient space.

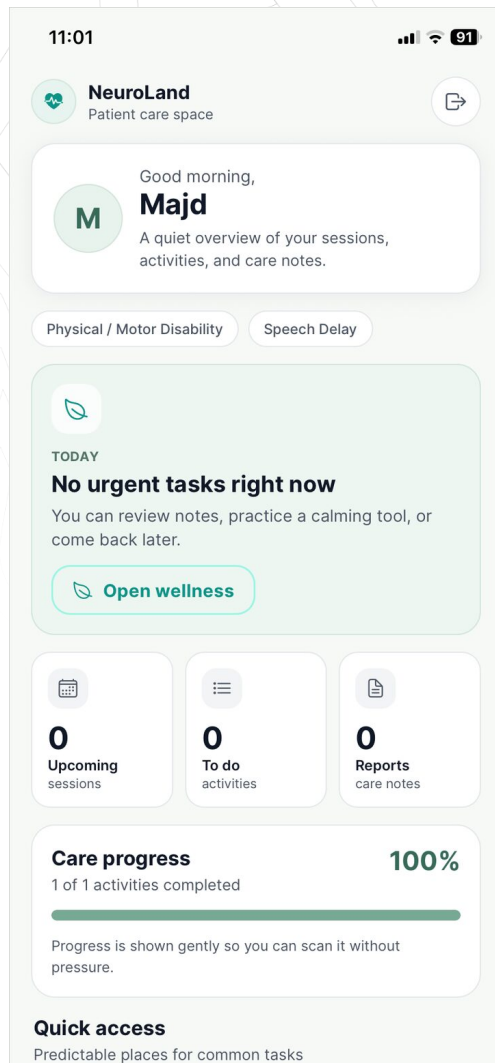
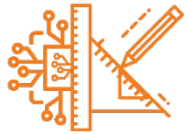


Figure 91: Patient space home showing pending tasks and care progress.

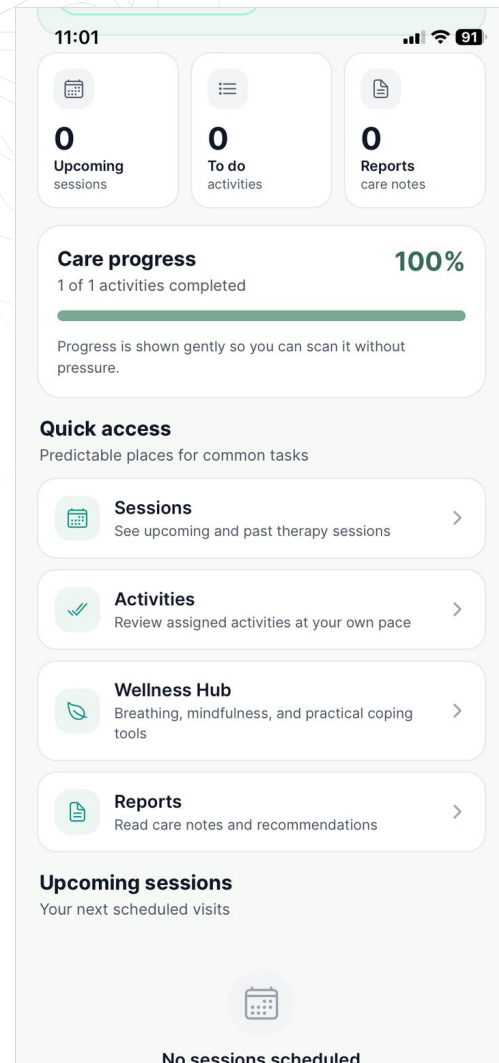


Figure 92: Patient care-progress breakdown across sessions, activities, and reports.

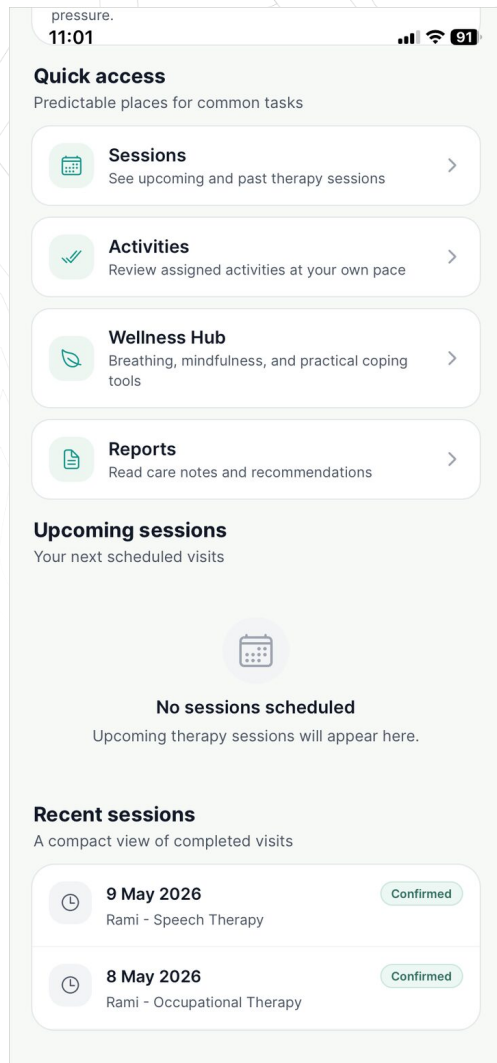
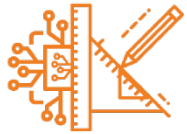


Figure 93: Patient quick-access menu for activities, wellness, and reports.

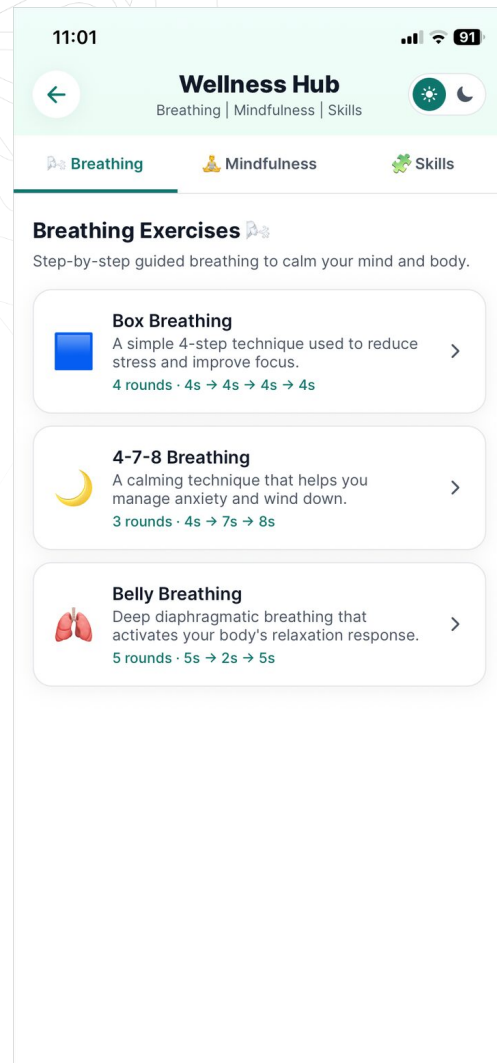


Figure 94: Wellness Hub — guided breathing exercises.

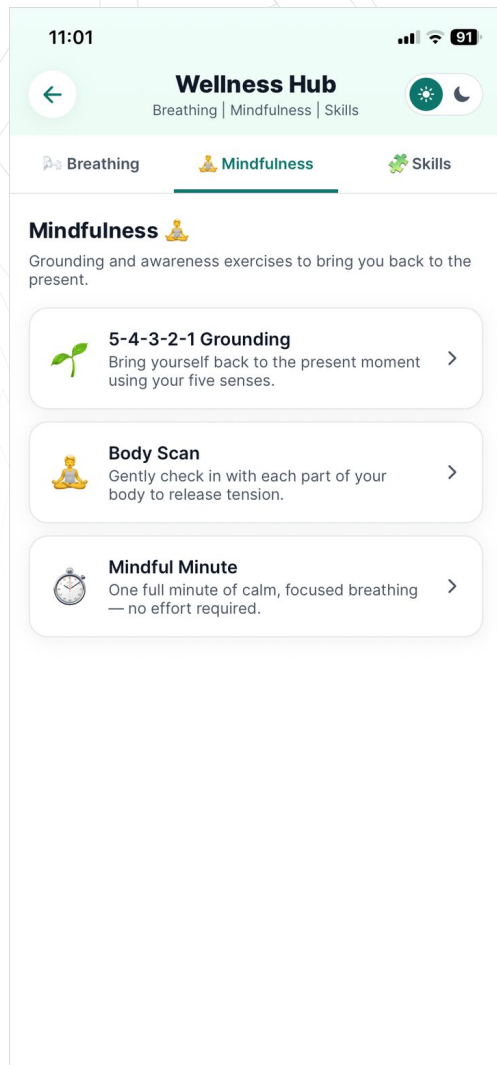
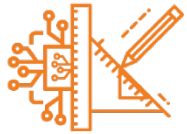


Figure 95: Wellness Hub — mindfulness exercises.

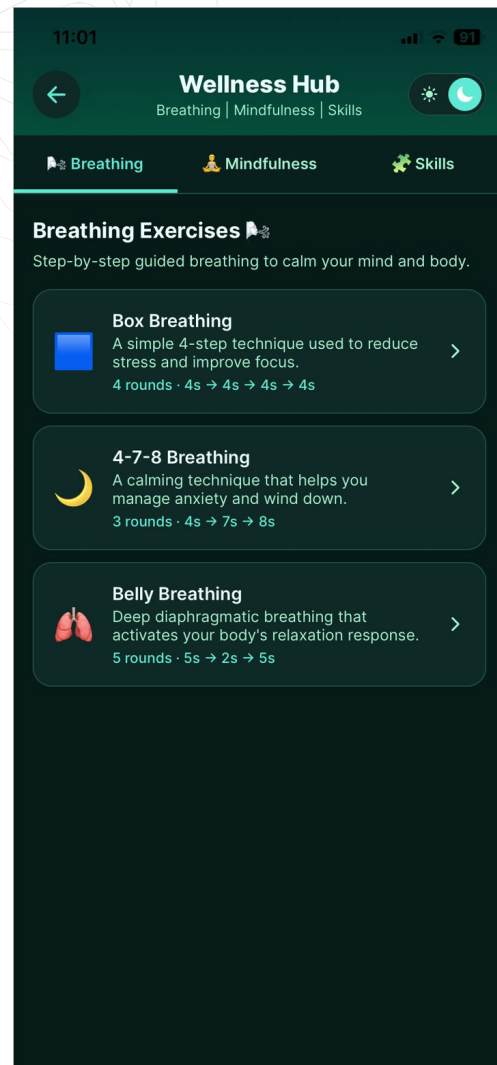


Figure 96: Wellness Hub shown in dark mode.

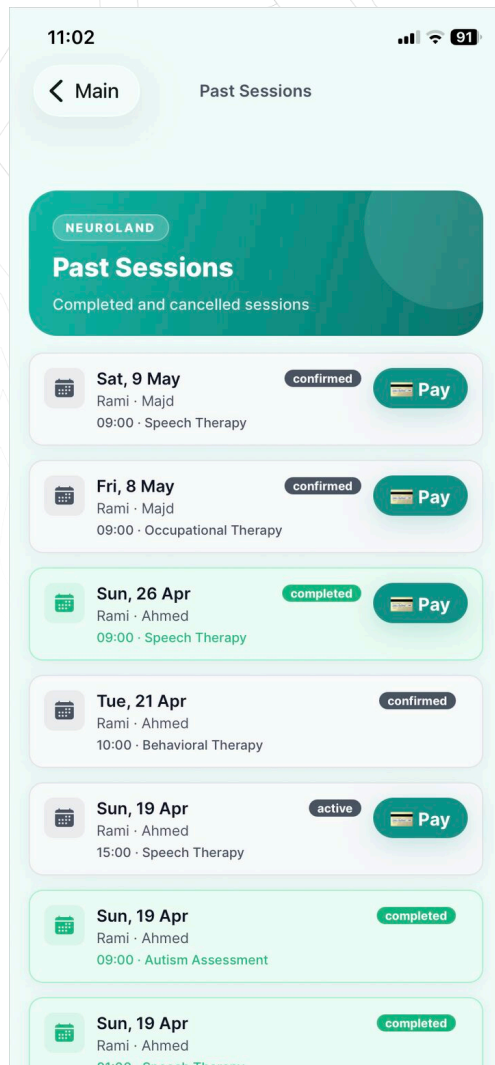
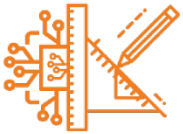


Figure 97: Past sessions with per-session payment actions.

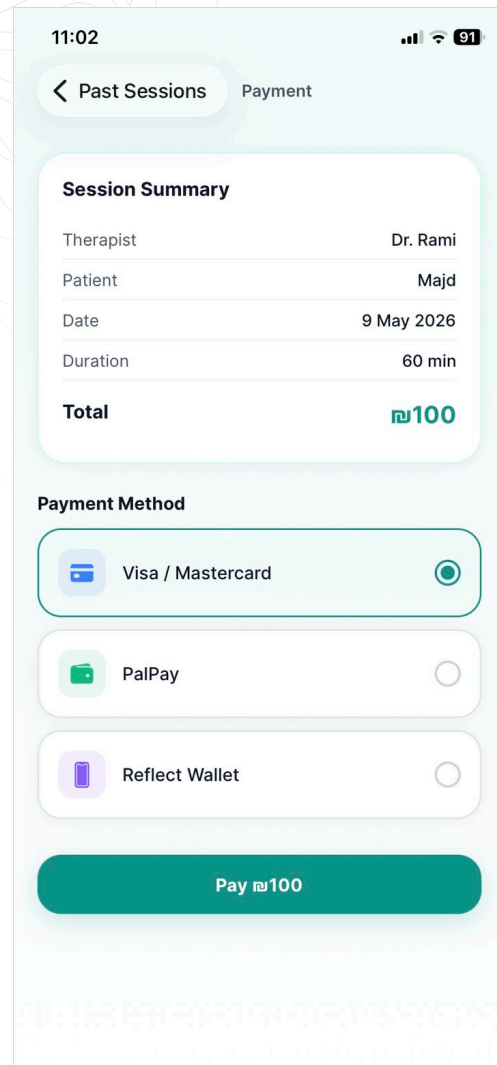


Figure 98: Session summary and payment-method selection.

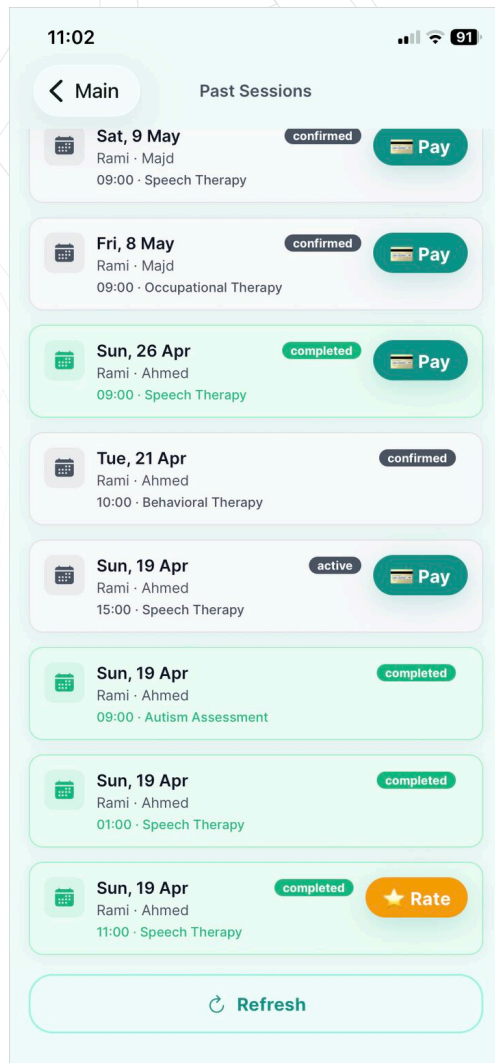
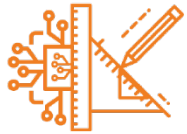


Figure 99: Additional past-sessions history.

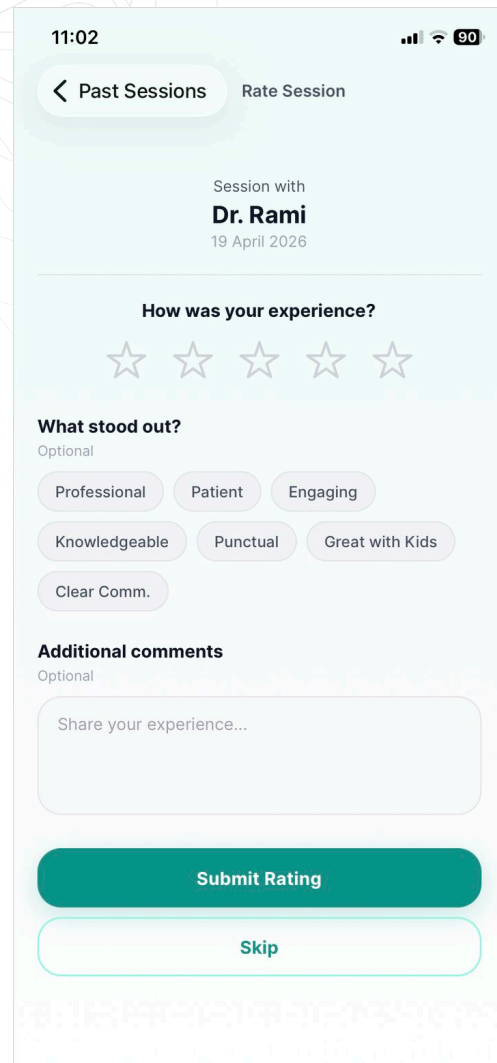
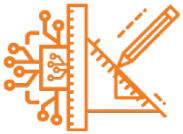


Figure 100: Post-session rating with a star score and feedback tags.



11:02 90

< Main Book Session

NEUROLAND

Book Session
Select therapist, patient and a slot

Therapist

Dr. Rami Dr. Dr. Sami Demo Dr. Siwar Diab

Patient

Majd (Age 27) Oday (Age 15) Majed (Age 9)

Session Type

Speech Therapy Occupational Therapy Autism

Date

2026-06-06

Duration (minutes)

30 min 45 min 60 min 90 min

Available Slots

Select a therapist to view slots.

Notes (optional)

Figure 101: Book-a-session flow — therapist, type, date, and time slot.

11:02 90

< Main Add Patient

NEUROLAND

Add Patient
Register a new patient

Name

Patient name

Age

Age

Disabilities

Category

Physical Neuro-developmental

Type

Autism ADHD Dyslexia Speech Delay

Severity

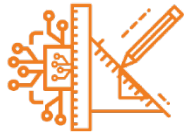
Mild Moderate Severe

+ Add Disability

Needs Guardian

Therapist Assignment

Figure 102: Add-a-dependent form capturing disabilities and severity.



11:02 90%

< Main Add Patient

Physical **Neuro-developmental**

Type

Autism ADHD Dyslexia Speech Delay

Severity

Mild Moderate Severe

+ Add Disability

Needs Guardian ☒

Therapist Assignment

Auto-assign best therapist ☒

Describe the case (optional)

Previous diagnoses, ongoing concerns, anything the therapist should know.

You can also upload reports and photos later from the dependent's profile.

Notes (optional)

Additional notes...

Add Patient

Figure 103: Add-a-dependent therapist assignment and case description.

11:02 90%

< Main Therapists

NEUROLAND

Assigned Therapists

Therapists linked to your family sessions

 **Rami**
ADHD, Autism, Physical Therapy
Nablus · — **Chat**

Refresh

Figure 104: Assigned therapists with quick chat access.

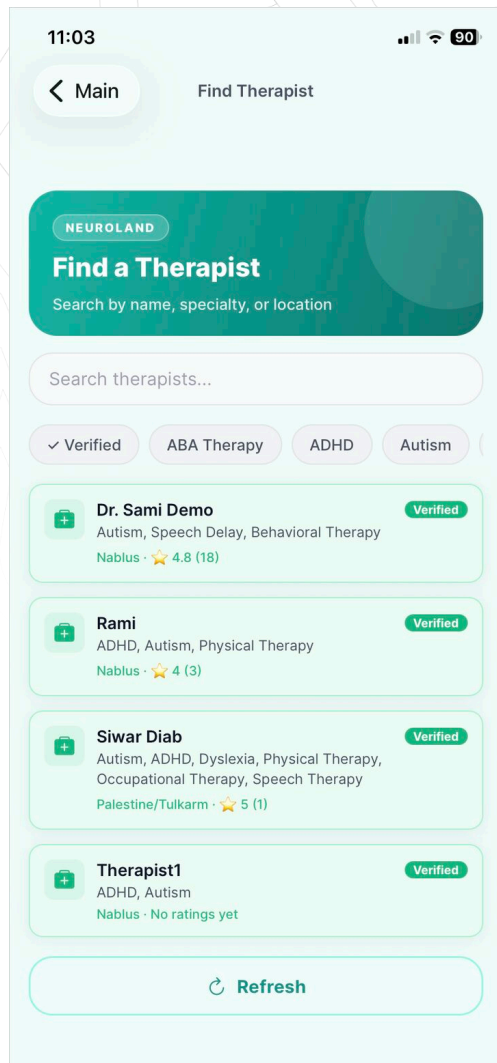


Figure 105: Find-a-therapist search by name and specialisation.

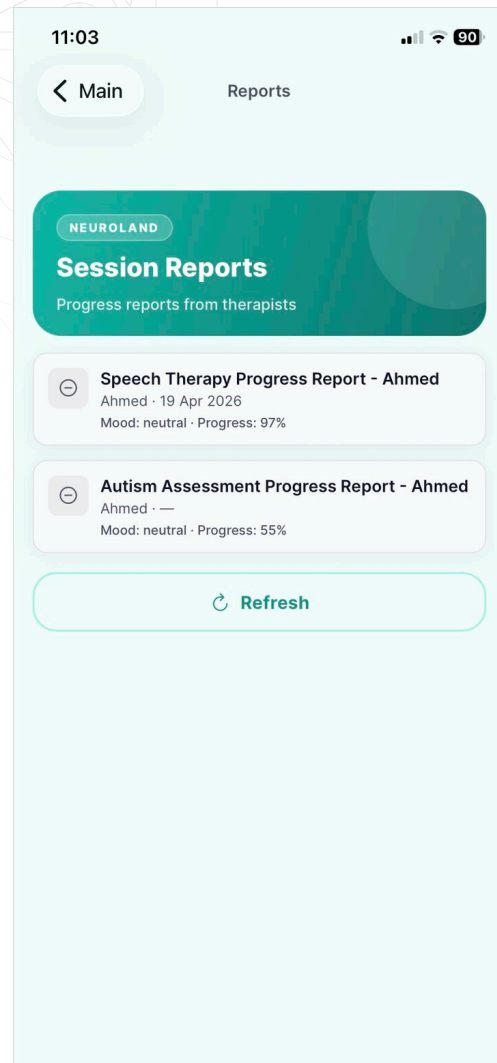


Figure 106: Reports list for the guardian's dependents.



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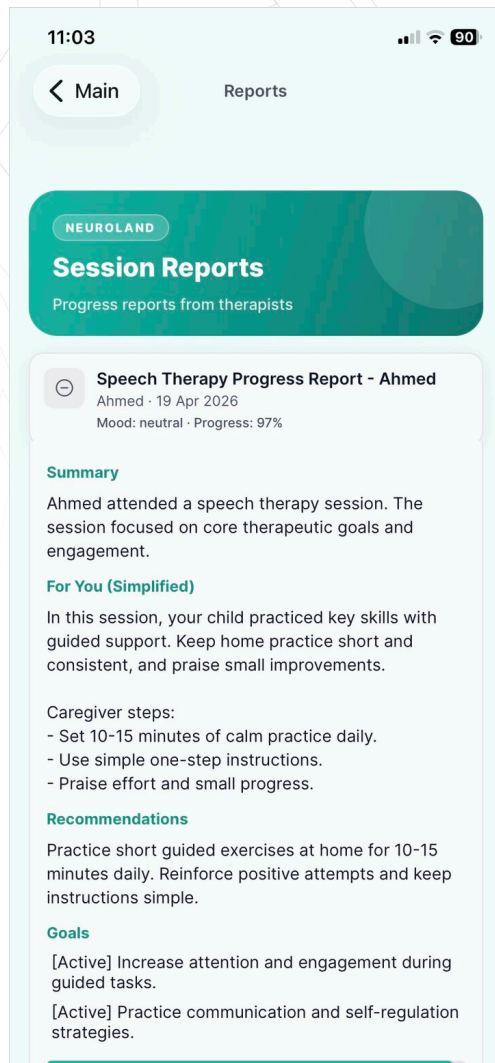
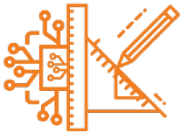


Figure 107: Session report with a parent-friendly summary.

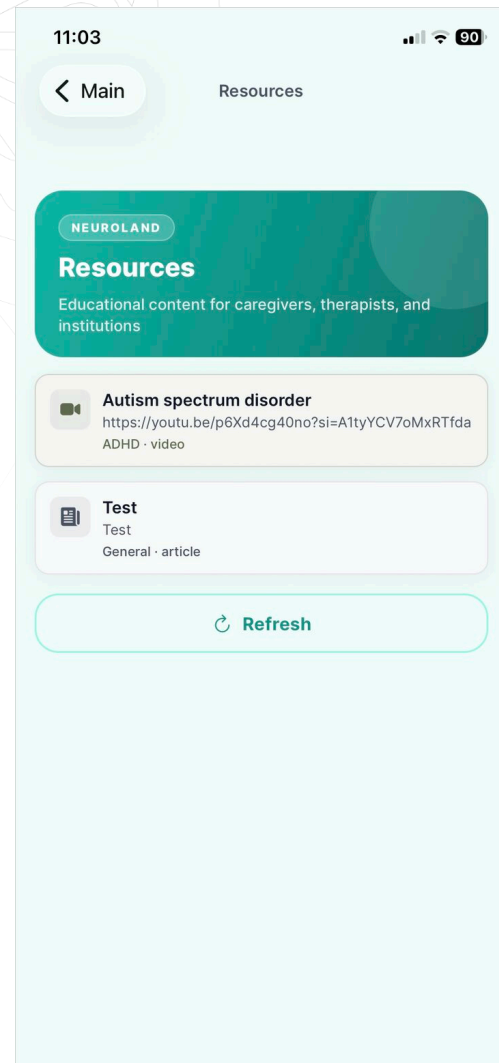


Figure 108: Educational resources hub.



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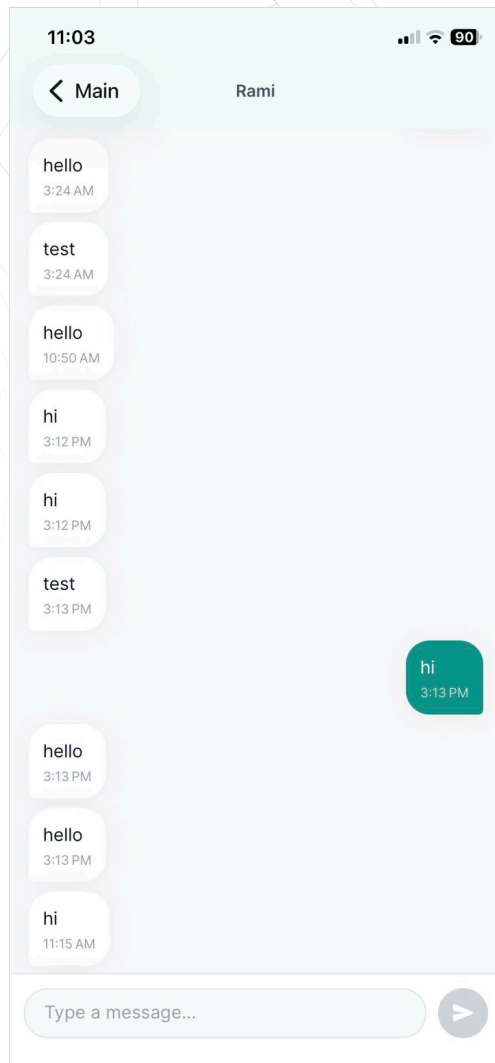
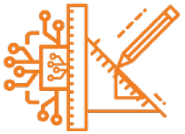


Figure 109: Real-time chat with a therapist.

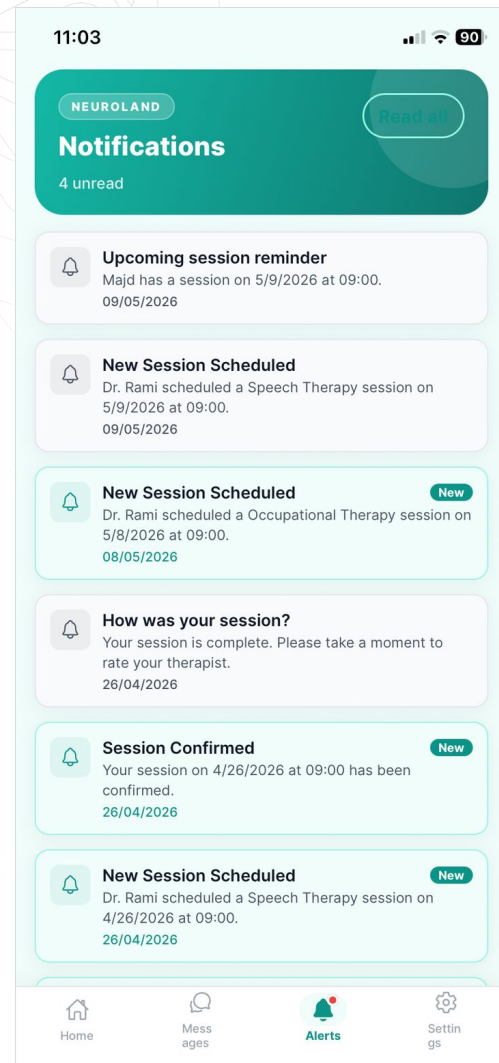


Figure 110: Notifications feed of reminders and confirmations.

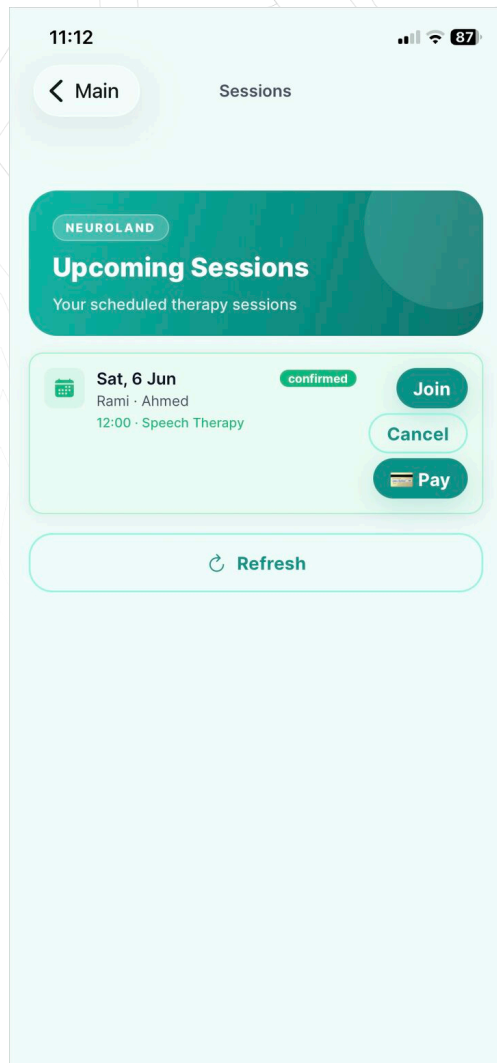
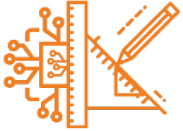


Figure 111: Upcoming sessions with cancel and pay actions.



C. Therapist Application

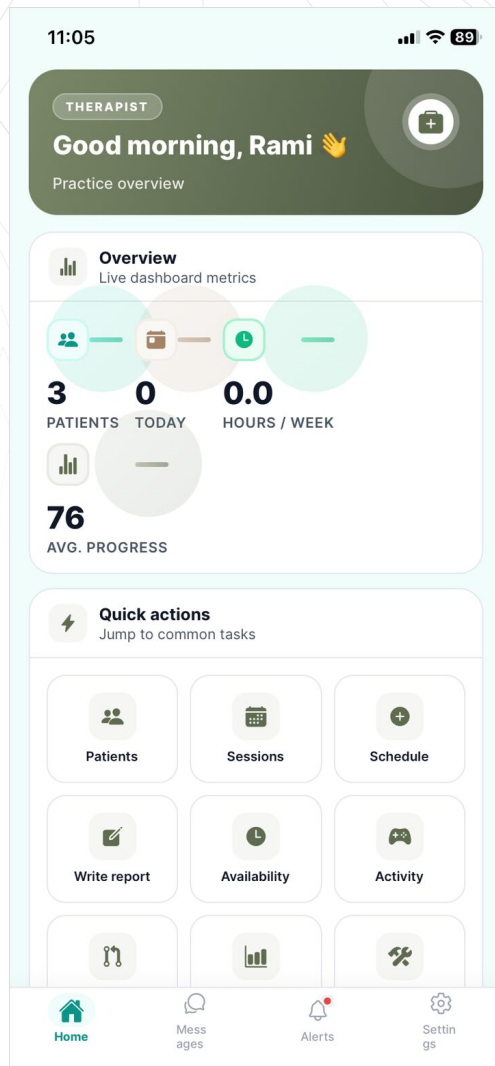


Figure 112: Therapist dashboard with live metrics and quick actions.



Figure 113: Assigned-patients list with quick chat.

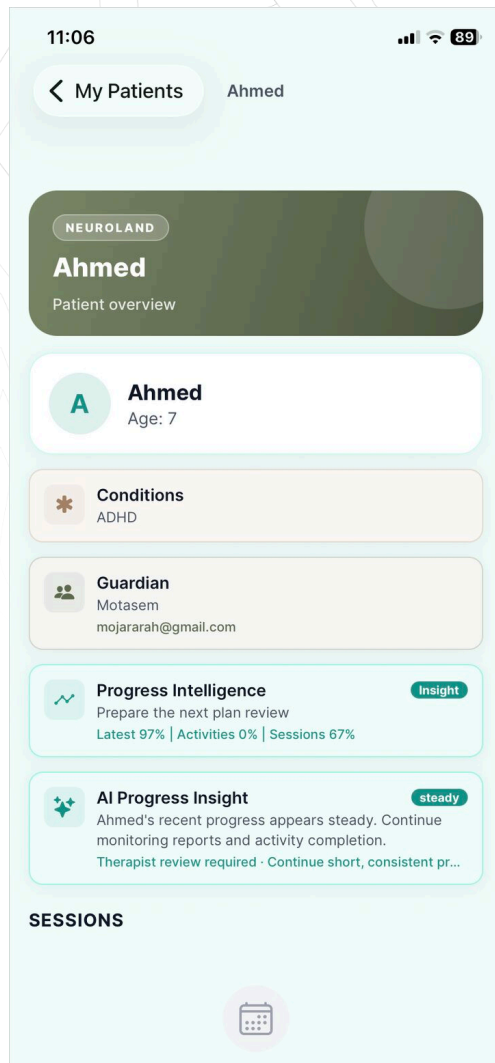
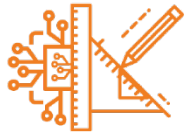


Figure 114: Patient detail with Progress Intelligence and an AI insight.

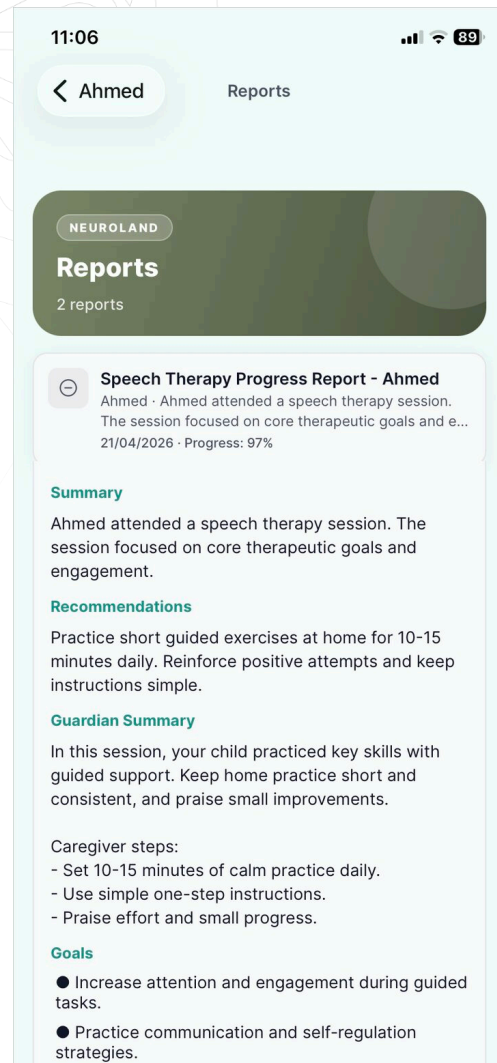
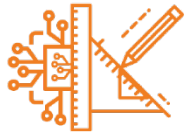


Figure 115: Session report with summary and recommendations.



11:06

< Main Schedule Session

NEUROLAND

Schedule Session

Create a new session for a patient

Patient

Ahmed (Motasem) Majd (Motasem)

Session Type

Speech Therapy Occupational Therapy Autism

Date

YYYY-MM-DD

Time

HH:MM (24h)

Duration (minutes)

60

Status

Pending Confirmed

Notes (optional)

Session notes...

Figure 116: Schedule-session form for a patient.

11:06

< Main Write Report

NEUROLAND

Write Report

Create a session report

Session

Aseel — Speech Therapy (27 May) Majd — Speech Therapy

Title

Report title

Your Notes (for AI context)

Quick notes about the session...

AI uses only this short context and avoids diagnosis or emergency advice.

AI Draft Report

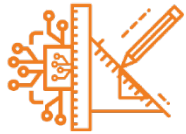
Summary

Detailed session summary...

Mood

Excellent Good Neutral

Figure 117: Write-report screen with AI-draft and mood capture.



11:06 89%

[Main](#) Write Report

Progress: 50%

0% 25% 50% 75% 100%

Recommendations

Recommendations for the guardian...

Guardian Summary

Simplified summary for the guardian...

[Simplify for Guardian](#)

Goals

Goal 1

Goal description...

not started in progress achieved

[+ Add Goal](#)

[Save Report](#)

Figure 118: Report progress slider, goals, and guardian-summary simplification.

11:06 89%

[Main](#) Set Availability

NEUROLAND

Set Availability

Configure your weekly schedule

Sunday ☒

Start 09:00 End 17:00

Monday ☒

Start 09:00 End 17:00

Tuesday ☒

Start 09:00 End 17:00

Wednesday ☒

Start 09:00 End 17:00

Thursday ☒

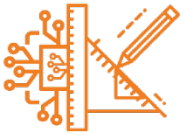
Figure 119: Weekly availability editor.



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11:06 89%

< Main Assign Activity

NEUROLAND

Assign Activity

Choose or generate an activity

Patient

Ahmed • Age 7 Majd • Age 27

Activity Template

Breathing Emotion Focus Speech

Goal Focus (for AI)

e.g., improve focus, practice speech...

AI Recommend

Due Date (optional)

YYYY-MM-DD

Preview

Calm Breathing Break

Practice a short breathing break to feel calm and ready.

easy

Figure 120: Assign-activity screen with AI recommendation and preview.

11:06 89%

< Main Requests

NEUROLAND

Assignment Requests

Approve or reject pending assignments

knmbk (null)
No conditions listed
Guardian: Unknown Guardian

Accept Reject

Oday (15)
ADHD
Guardian: Motasem

Accept Reject

Majed (9)
Autism, Physical / Motor Disability
Guardian: Motasem

Accept Reject

Refresh

Figure 121: Assignment-requests queue with accept and reject.

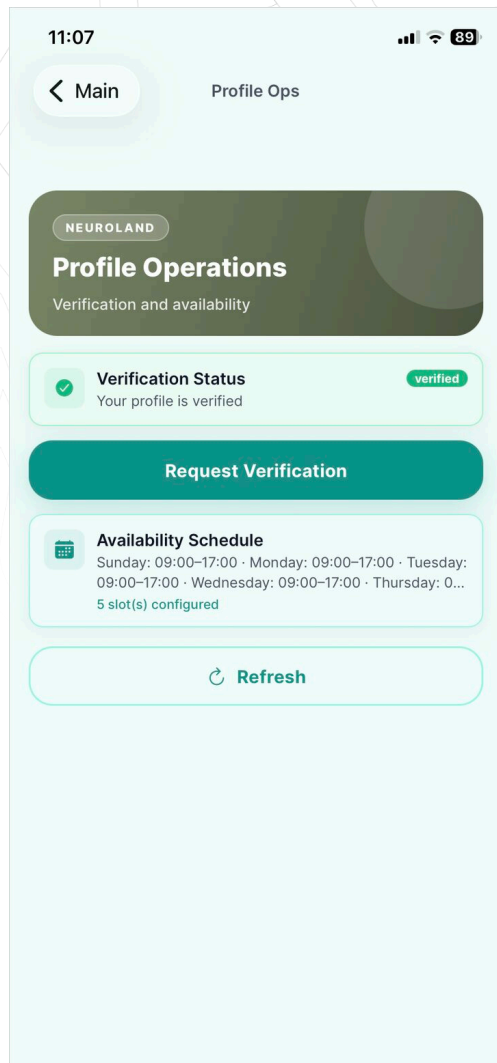
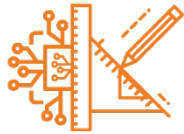


Figure 122: Profile operations and verification status.

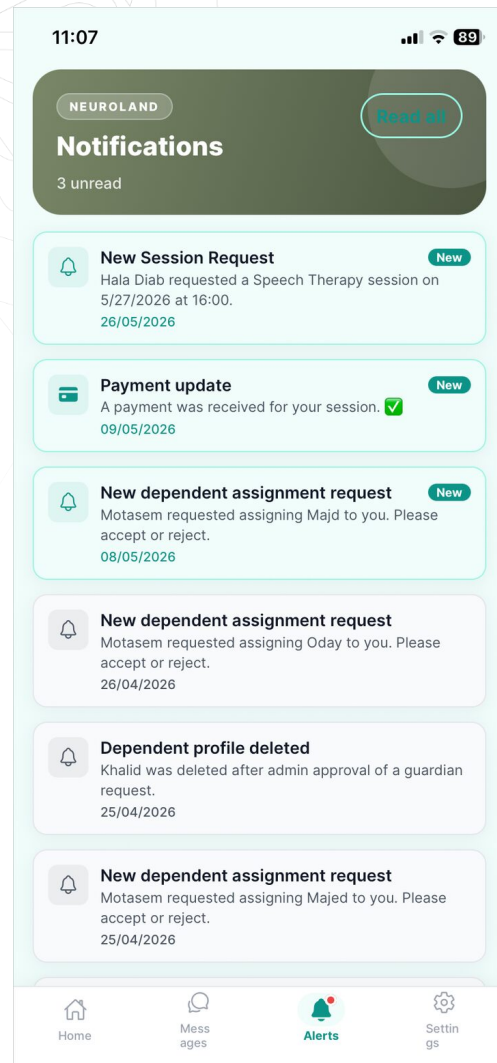


Figure 123: Notifications feed of session requests and payments.



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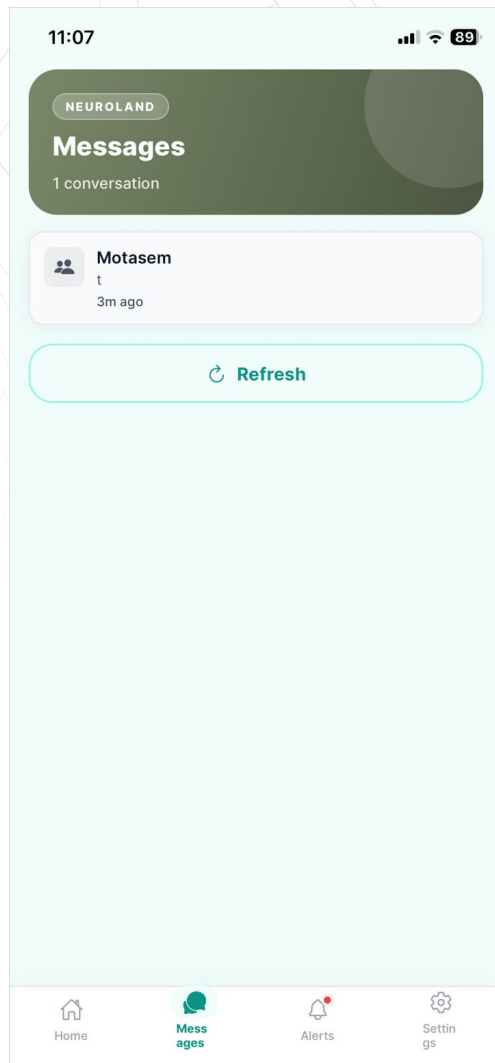
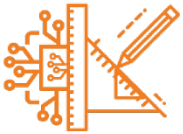


Figure 124: Messages conversation list.

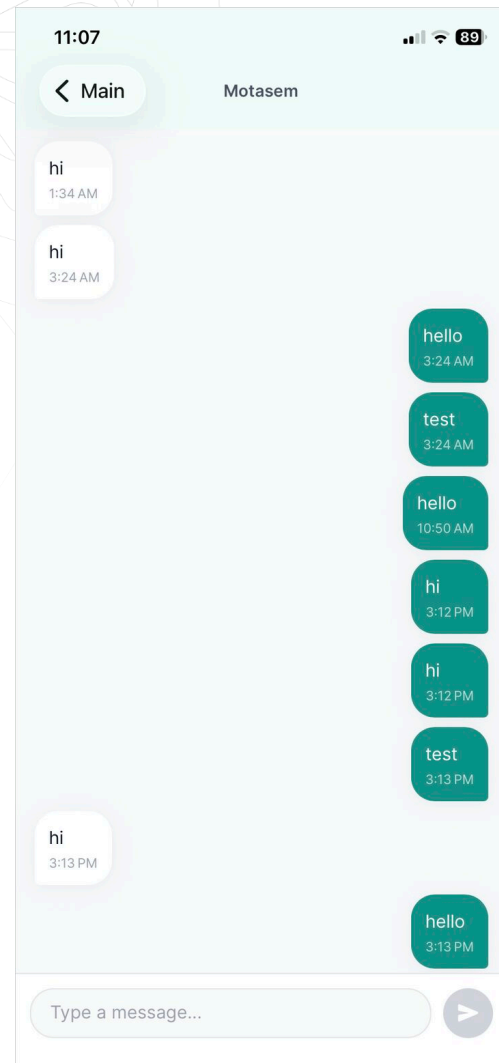


Figure 125: Real-time chat with a guardian.



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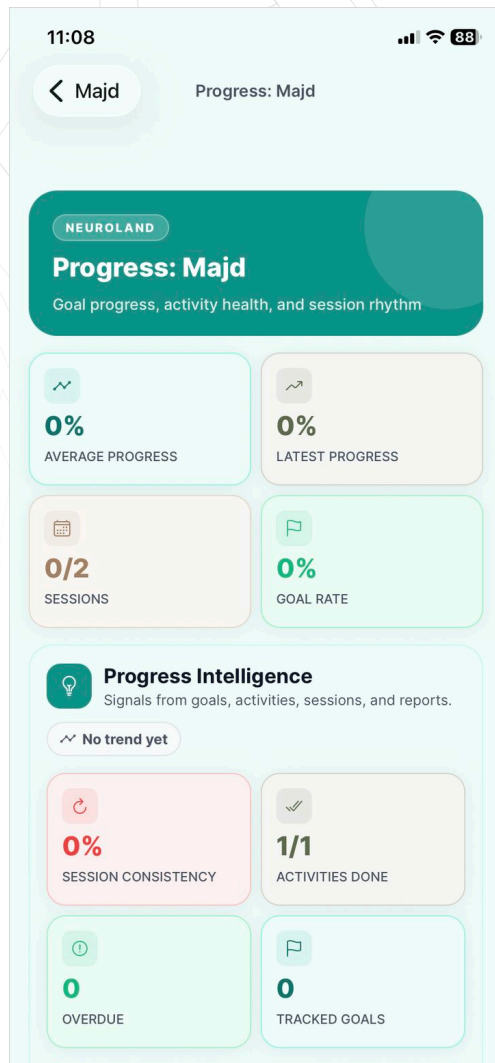
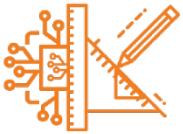


Figure 126: Progress Intelligence summary for a patient.

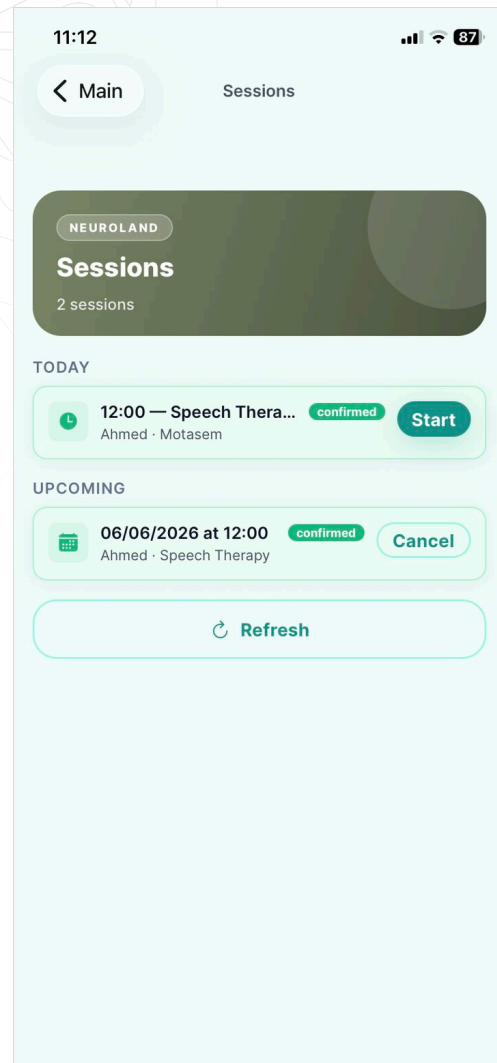
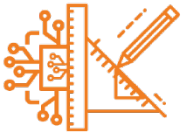


Figure 127: Today and upcoming sessions with start and cancel actions.



D. Institution Application

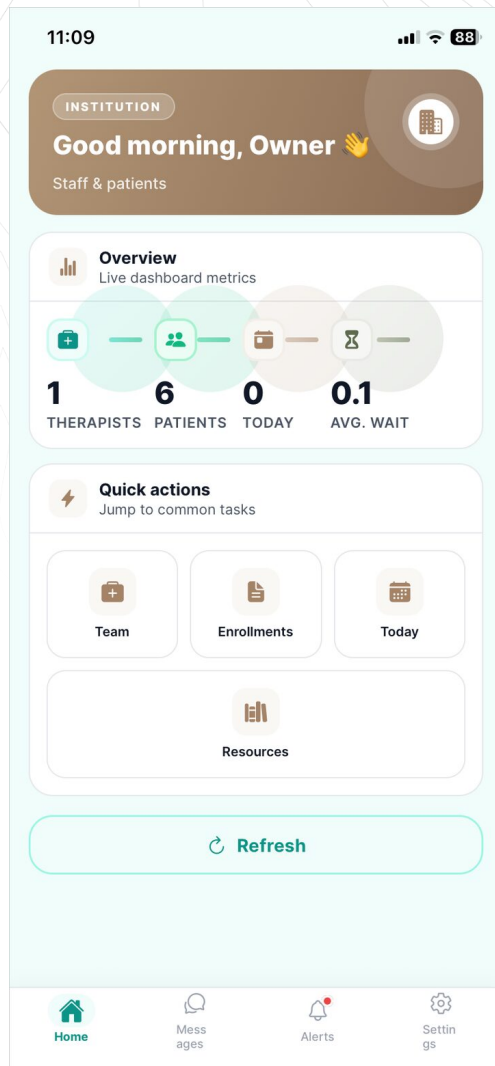


Figure 128: Institution dashboard with staff and patient metrics.

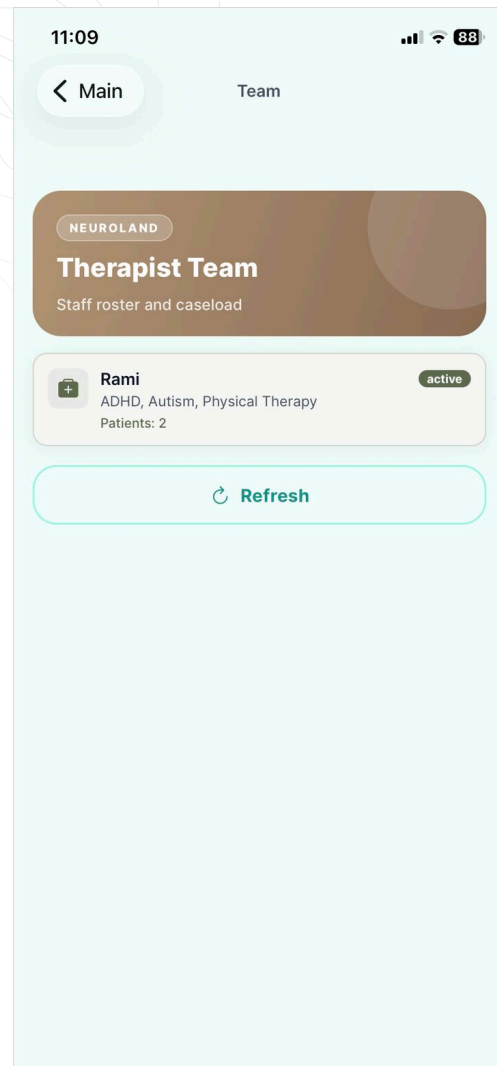


Figure 129: Therapist-team roster and caseload.

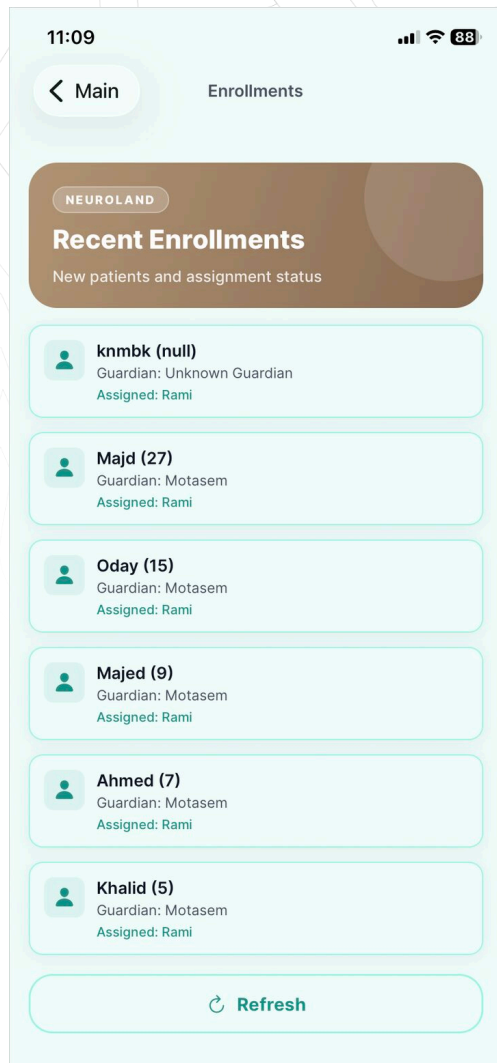


Figure 130: Recent enrolments and assignment status.

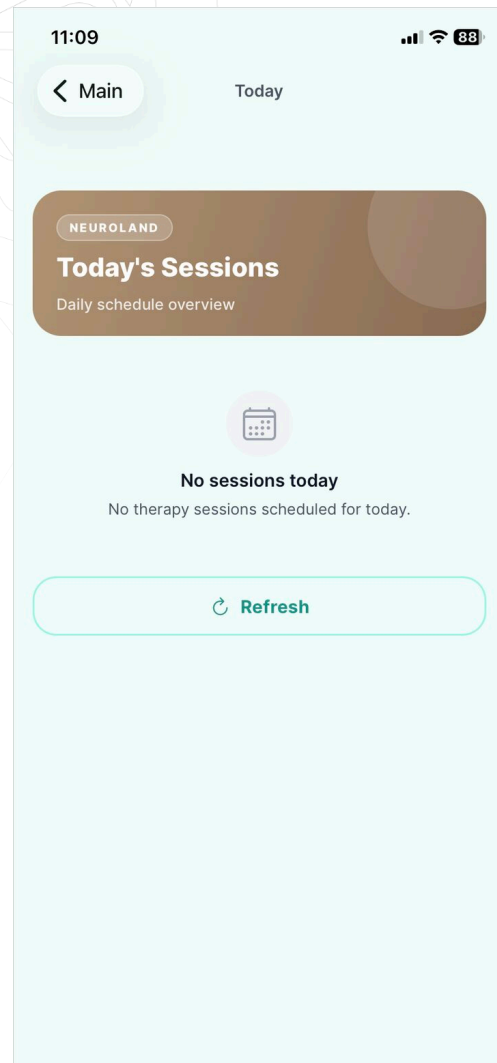


Figure 131: Today's sessions overview (empty state).



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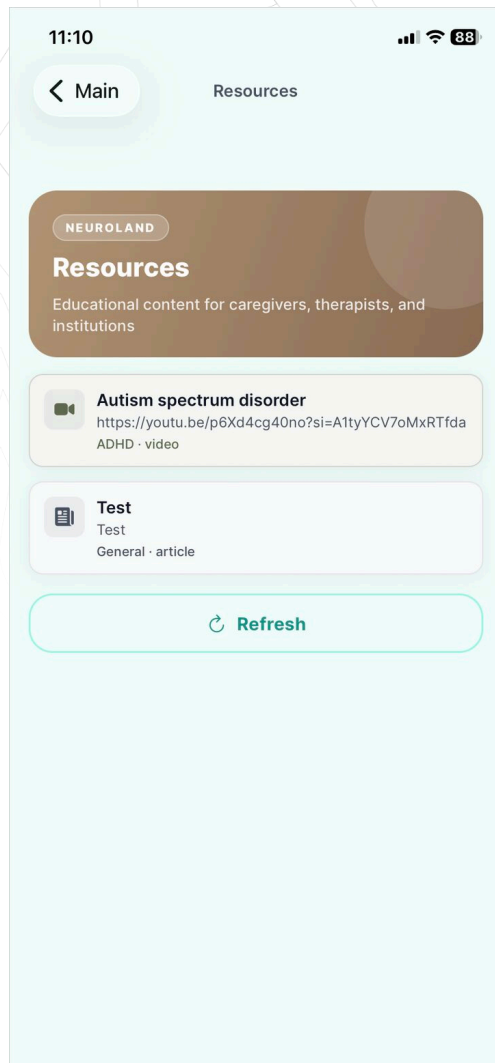
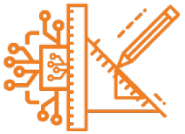


Figure 132: Institution educational resources.

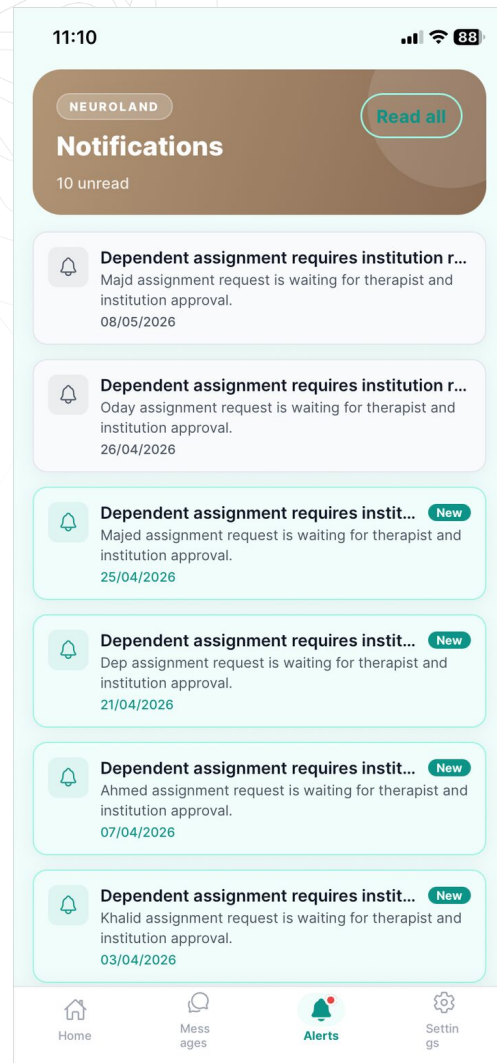


Figure 133: Notifications of enrolment-approval requests.



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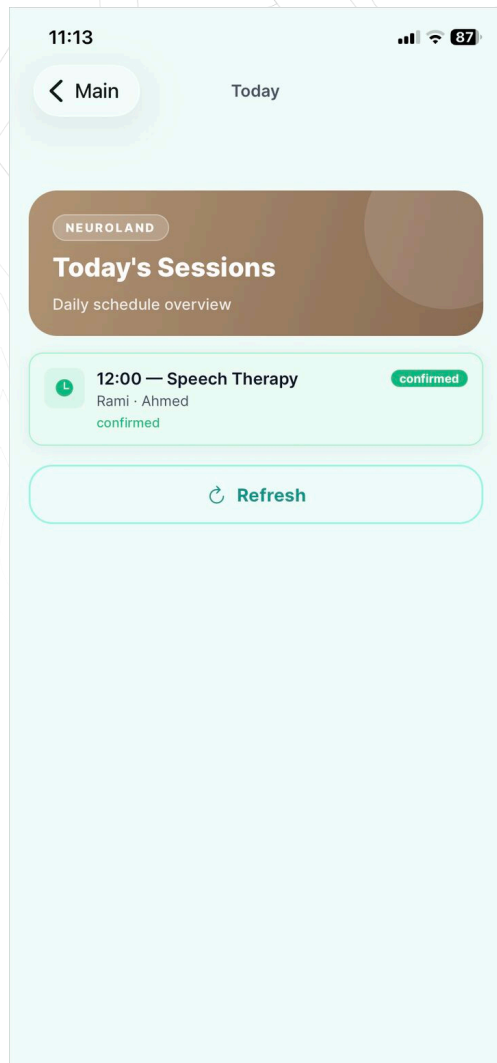
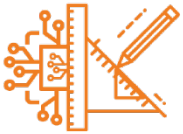
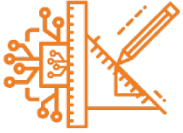


Figure 134: Today's sessions with a confirmed session.



4. Results and Analysis

The project was delivered as three working applications backed by a shared API. This section summarises the achieved feature coverage, the workflows that span the full stack, and the platform's operational characteristics.

4.1 Feature Coverage by Surface

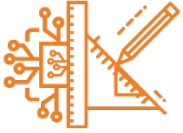
Table 6: Feature coverage by surface (web, mobile, and server).

Capability	Web	Mobile	Server
Multi-role registration / login	Yes	Yes	Yes
Therapist directory with verified-only listing	Yes	Yes	Yes
Therapist approval gate (signup to admin-verified)	Yes	Yes	Yes
Credential document upload (server-streamed)	Yes	—	Yes
Session booking and scheduling with conflict checks	Yes	Yes	Yes
Real-time messaging	Yes	Yes	Yes
Video calls (WebRTC / Zoom)	Yes	—	Yes
Reports with AI-assisted drafting and simplification	Yes	Yes	Yes
Treatment plans (goals, objectives, milestones)	Yes	Yes	Yes
Patient PIN access and accessibility preferences	Yes	Yes	Yes
Mobile push notifications	—	Yes	Yes
Email notifications and weekly digest	Yes	—	Yes
Mock and provider-ready payments	Yes	Yes	Yes
Admin verification flow and activity log	Yes	—	Yes
Admin custom user report (range, sections, print)	Yes	—	Yes
Bilingual EN / AR with RTL	Yes	Yes	Yes

4.2 Workflows That Span the Stack

Therapist onboarding. Sign-up stamps a pending verification state; the therapist lands on the approval gate, uploads credential documents, and an admin reviews them from the verifications panel. Approval lifts the gate; rejection returns a note the therapist can act on and resubmit. Every step is logged.

Guardian session booking. The guardian browses verified therapists, opens a profile, and picks a slot from the therapist's availability. The server conflict-checks the slot, runs the assignment or institution-approval workflow as needed, processes the mock payment, confirms the session, and issues a calendar invite and bell notification, followed by a reminder and a video-room link on the session card.



Therapist write-up loop. On completing a session, the therapist writes a report with an AI-assisted draft and a parent-friendly simplification. The guardian sees it under the relevant patient with a status pill and progress percentage, AI progress insights surface trends, and the next activity is recommended automatically.

4.3 Operational Characteristics

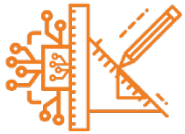
Latency. Routes typical of the platform — listing verifications, generating a user report, fetching conversations — complete in well under a fifth of a second against a local MongoDB. AI calls, bounded by the model, are protected by a timeout with a deterministic fallback so the user never waits indefinitely.

Throughput. Rate-limited authentication keeps registration and login under control; the remaining endpoints are inexpensive CRUD or read-mostly aggregates, which keeps the API responsive under demonstration load.

Resilience. Fire-and-forget side effects — audit log, push, email, and AI fallbacks — never block the user request. If any of them fails, the warning is logged and the user-facing call still succeeds.

4.4 Analysis

The headline result is that the four design pillars were realised end-to-end rather than partially. Trusted discovery is enforced at three layers; the care record is genuinely linked, not merely co-located, which is what enables the single progress view; real-time collaboration works across both clients; and the patient interface is usable by a child without an email account. The feature matrix also makes the platform's honest boundaries visible: a small set of capabilities (credential upload, video, admin tooling, and email digest) remain web-only, reflecting deliberate scoping rather than incompleteness in the shared API.



5. Discussion

5.1 Key Design Choices

Server-authoritative role logic. Every role guard and permission check lives on the server. The clients duplicate the gating only for user experience — so an unverified therapist never sees the dashboard — never for security. This eliminated a whole class of “client says verified, server still allows” defects and kept the mobile client small.

Notifications as a fan-out, not a feature. Treating every meaningful event as something that fans out to in-app, email, push, and audit — rather than as a per-feature concern — meant that adding a new admin action or patient event reduced to a single call: log it, notify the right people, and let the channel layer decide what each recipient actually receives.

Build the audit and verification posture first. The approval gate, the credential pipeline, and the audit log were treated as foundations. Once in place, every later feature slotted into them naturally, which is the inverse of the common student-project pattern of adding security at the end.

5.2 Trade-offs

Local AI versus cloud LLMs. Hosting the model locally keeps every prompt private and removes the data-sharing concern of sending notes to a third party, but it caps model capability to what a developer machine can serve and forces strict token budgeting.

Mock payments. Real processor integration was out of scope. The codebase ships webhook handlers and provider scaffolding, but a production deployment would need a merchant account and a live key.

Local file storage for credentials. Credential files live on the server's disk in per-user directories. This is acceptable for the project's deployment posture but would require object storage with signed URLs for a real rollout.

Append-only but not tamper-evident audit. The audit log is append-only; a hash chain or external write-once store would strengthen it against insider modification, but the current structure is the right shape for that future upgrade.

5.3 Limitations

- The mobile app does not yet expose institution analytics or admin tooling; those remain web-only.
- The push-notification path works on physical devices but cannot be exercised on a simulator, which is an Expo platform limitation rather than a project one.
- The educational-resources hub supports articles and videos but does not yet support downloadable worksheets or PDFs.



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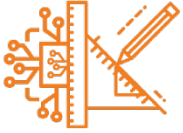
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- The recommendation engine ranks therapists on a transparent rule set (specialisation match, city, availability, experience, and caseload); it does not yet learn from booking outcomes.



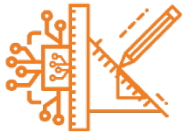
6. Conclusions and Recommendations

6.1 Conclusions

NeuroLand delivers a multi-role, multi-platform care-coordination product that materially advances on the typical appointment-booking baseline. It links every record into a longitudinal care chain, treats verification and audit as foundations rather than optional extras, and gives a child a usable, accessible interface of their own. The four objectives set out in the introduction — trusted discovery, an end-to-end care record, real-time collaboration, and accessibility and inclusion — were each realised across the web and mobile clients on top of a single shared API, and the project's honest boundaries (mock payments, local storage, and a small set of web-only screens) reflect deliberate scoping rather than gaps in the core design.

6.2 Recommendations for Future Work

5. Move credential storage to object storage with signed download URLs, keeping the database record but removing the on-disk dependency.
6. Activate a real payment provider end-to-end, including refunds and receipts surfaced in the guardian's session history.
7. Extend the rule-based therapist recommender with a lightweight outcome signal such as guardian feedback, completion rate, and repeat-booking ratio.
8. Harden the audit log with a hash chain or external append-only store to make it tamper-evident.
9. Bring the activity log, statistics overview, and verification queue to the mobile app so administrators and institution leads can act on the go.
10. Add two-factor authentication for therapists and administrators, who both handle sensitive data.
11. Let a guardian export a dependent's consolidated record as a single PDF, reusing the admin report builder as the substrate.
12. Open the educational-resources hub to admin-curated content, including downloadable worksheets and, potentially, a revenue-share model for institutions.



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