Chelsea FC Physical Monitoring Dashboard

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Introduction:

This Chelsea FC Physical Monitoring Dashboard has been developed to provide a clear, actionable overview of a player's physical status. The dashboard converts multiple data streams into simple, digestible outputs that can guide /support daily decisions. The primary aim is to remove complexity for coaches and players by combining physical load, recovery and readiness indicators into easy to interpret metrics within a visual format.

Data Sources & Key Metrics

The dashboard is built on the GPS dataset and the recovery dataset

The Primary metrics visualised:

- Total Distance
- High-Speed Running (distance_over_21)
- Acceleration & Deceleration Counts (accel_decel_over_2_5)
- Recovery Score
- Readiness Flag (calculated within this piece, see below for more detail)
- Injury Risk Score (calculated within this piece, see below for more detail)

Calculated Metrics:

- Readiness to Perform: Based on acute load (last 7 day weighted average), recovery score, and peak speed exposure (relative to max). Categorised as Ready, Monitor or Reduced.
- Injury Risk Score: Combines penalties from elevated load, recovery scores, and readiness to perform into a single score from 0 to 1, indicating injury likelihood.

Dashboard Overview & User Context

The dashboard is designed for a coach or practitioner assessing a player at the start of the training day. For context, at the time of review, recovery scores for the current day are not yet available, so the latest data point reflects yesterday's session.The dashboard guides the user through a clear performance story across four key sections.

Section 1. Calendar Carousel

Provides quick visual context to the player's recent and upcoming schedule. Includes symbols for match days, training, and recovery sessions, along with MD labels.

Section 2. Last 28 Days – Physical Load Monitoring

Three KPI boxes display load trends for the last 7 days for Total Distance, High-Speed Running and Acceleration/Deceleration Counts. Each is calculated as a 7-day Exponentially Weighted Moving Average (EWMA) and compared to the 28-day chronic average. EWMA is used over traditional rolling averages due to its greater sensitivity to recent load spikes, as supported in scientific research.

Metrics are presented as a % delta from the 28-day EWMA, colour-banded as follows:

Load Status

- Elevated Load: > +20%
- Moderate Load: +10% to +20%
- Balanced Load: –10% to +10%
- Slightly Reduced: –10% to –20%
- Reduced Load: < –20%

Section 3. Readiness & Injury Risk Section

This section combines multiple underlying metrics into an easily readable classification system:

- Readiness Status: Based on load spikes, recovery deviation, and peak speed (≥95% max).
- Injury Risk Score: A value between 0 and 1 representing combined penalties for:
    - Recovery below baseline
    - Readiness flagged as "Monitor" or "Reduced"
    - Elevated Load (particularly on MD–1 or MD–2)

This area is designed for fast decision-making, showing whether a player is physically prepared for the day or needs monitoring. The aim is to reduce time required from a coach to understand several metrics and make a decision.

Section 4. Predictive Modelling Outputs

This final section aims to provide a look to the future showing two data points calculated using machine learning from the rest of the data points contained in the previous sections. The metrics are a Predicted Recovery Score which was calculated using a Random Forest Classifier Model and a Session Load Prescription (Total Distance) calculated using a Random Forest Regressor Model.

Note: Models are included as proof of concept and have not been fully tuned due to time constraints.

Conclusion

This dashboard provides a one-screen overview of a player's past workload, current readiness, injury risk, and future prescription. The dashboard transforms raw GPS and recovery data into a practical, professional decision-support tool. Future development may include player-specific profiling, more detailed injury forecasting, integration of additional data streams such as testing benchmarks and tuning of machine learning models.