

Football Team Hydration Monitoring Plan

Numbers of Players: 30 **Number of MX3 HTS Required:** 2

Est. Number of Test Strips/Year: 2500

Est. Number of Sweat Test Kits/Year: 30

Initial Hydration Profiling

Salivary osmolarity (SOSM)

To establish an initial baseline SOSM range, players will undergo a day of hyperhydration consisting of consuming more fluid than normal and consistently throughout the day to reach a euhydrated state.

- If possible, this will be a rest day for the player or a day when exercise is light to avoid the impact of dehydration on the euhydrated baseline SOSM range.

At the end of this day of hyperhydration a series of at least 6 measurements is carried out using the MX3 HTS, with values assigned to “**baseline**” within the app.

- For each measurement ask the player to swallow all saliva in their mouth and generate a fresh saliva sample for measurement.

Following completion of this process, an optimal hydration zone (OHZ) corresponding to the players personalised euhydrated SOSM range will be displayed on the hydration status bar as shown below:



The initial population-based hydration ranges (**Hydrated** = <65mOsm; **Mildly dehydrated** = 66-100mOsm; **Moderately dehydrated** = 101-150mOsm and **Severely dehydrated** = >150mOsm) will then also be adjusted to the players OHZ.

Sweat Sodium Profiling

MX3 recommends to initially profile all players sweat sodium concentration to understand their personalized electrolyte needs

- The sweat sodium test should be carried out at match level intensity as sweat sodium concentration can vary according to exercise intensity
- Sweat test should be performed at average playing temperature as sweat sodium concentration varies for a player when training in different climates.
- If a significant variation in diet occurs, we recommend to re-profile the player as changes in dietary sodium can impact electrolyte replacement needs.

Sweat sodium is classified into four categories (**Low** = <750mg/L; **Moderate** = 750-1100mg/L; **High** = 1100-1450mg/L; **Very High** = >1450mg/L)

Once baselining of SOSM and initial sweat profiling has been completed for a player this will be displayed on their user profile to enable assessment of hydration status and understanding of electrolyte replacement needs.

Use of the MX3 HTS During the Season

Preparing Players

SOSM should be assessed 3-4hrs prior to training so that nutritionists and coaches can evaluate hydration status of players relative to their OHZ.

- If a player is within their OHZ, advice on continuing normal hydration during the 3–4-hour period is given, based on their sweat sodium concentration.
- If a player is slightly out of their OHZ (i.e., mildly dehydrated) advice on increasing hydration with an appropriate beverage based on their sweat sodium profile can be given to allow the player to be optimally hydrated prior to training.
- If a player is significantly out of their OHZ (i.e., moderately dehydrated) advice on increasing hydration with an appropriate beverage based on their sweat sodium profile can be given, including an initial bolus of 500ml consumed within the first 30mins. Performance staff may choose to retest this player 45minutes prior to training.
- If a player is severely dehydrated an initial bolus of 500ml of beverage based on their sweat sodium profile will be given followed by recommendations on consistent rehydration over the course of the 3-4hr period. We recommend performance staff retest the player 45min prior to training to ensure hydration status has improved significantly.

Assessing Dehydration

SOSM measurements can be undertaken post-training or during a match at half time/full time to assess whether sufficient fluid was replaced during exercise

- It is expected that an athlete will not be able to replace all fluid lost during exercise and therefore an increase in SOSM is expected post-exercise
- If a player is severely dehydrated or there SOSM score has doubled this indicates that inadequate fluid was consumed during training.
- For a match scenario where fluid is not readily available, it is expected that greater increases in SOSM will be seen. Measurements taken at half time and full time should ensure that contamination of fluid used for rehydration does not bias SOSM measures, therefore, if possible, performance staff should measure players prior to rehydration or allow 3-5 minutes following fluid consumption to make measurements.

Assessing Recovery

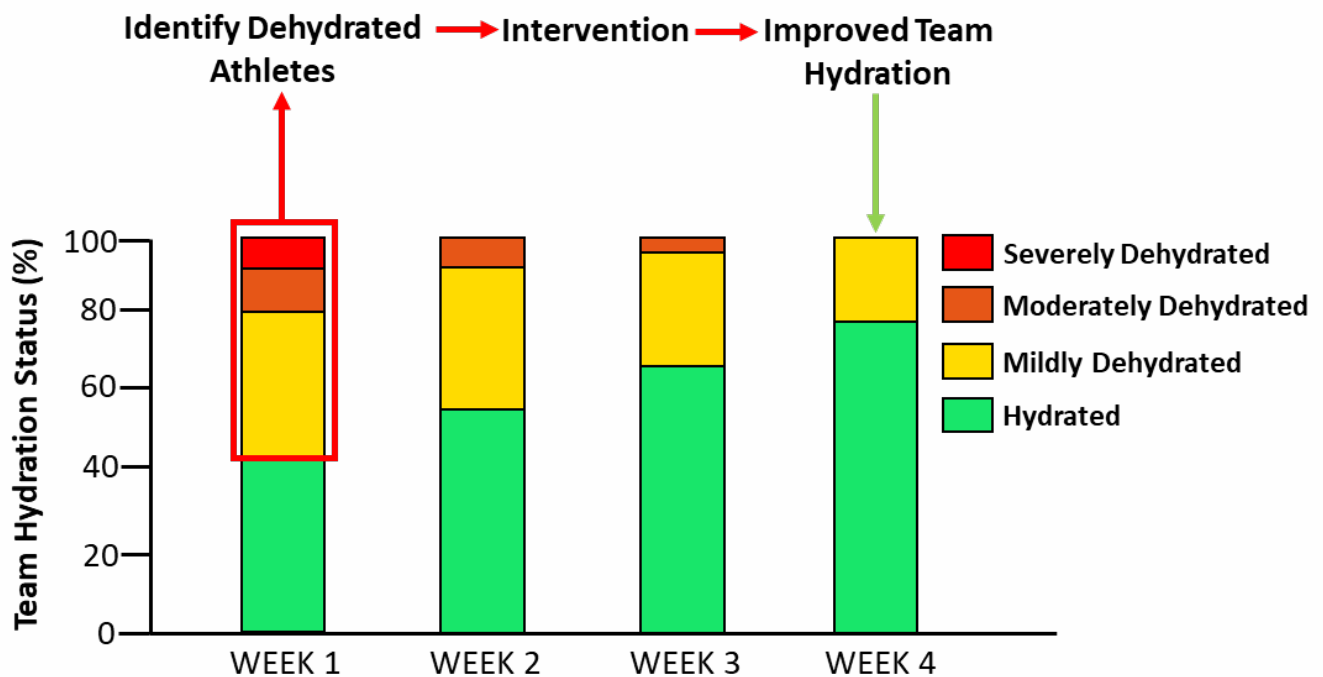
By measuring SOSM in the hours/next day following training or a match assessment on whether a player has rehydrated can be made by comparing their score to their OHZ

- Players who are within their OHZ or lower have sufficiently rehydrated back to a euhydrated state. Depending on the time of measurement, the athlete should be encouraged to maintain their normal hydration or if in the evening and close to the time they will go to sleep advised not to consume excess fluid to prevent disruption of sleep.
- If a player is slightly higher than their OHZ they should be advised to maintain hydration for the next couple of hours to rehydrate fully.
- If a player is still moderately/severely dehydrated assessment of the type of beverage and amount of fluid consumed should be undertaken. Where necessary players should be encouraged to drink a higher electrolyte beverage and/or increase their fluid intake to boost rehydration and recovery.

Identifying players with increased susceptibility to dehydration

Through assessment of team hydration status players can be identified who might be more susceptible to dehydration, either due to heavy fluid losses or due to excessive loss of electrolytes.

- Through tailored intervention performance staff can improve team hydration status by develop personalized rehydration plans for players
- Player’s hydration behaviors are positively influenced by team hydration tracking with positive empowerment and rehydration advice given to those who may struggle to maintain optimal hydration



Long term hydration tracking

Following implementation of the MX3 HTS and improvements in hydration status of players it maybe beneficial to reassess players OHZ to see if there SOSM range has decreased (i.e., improved) from their initial profiling.

- Re-baselining of athletes together with sweat sodium profiling just prior to the season starting will enable assessment of improved overall hydration status and provide up to date accurate results for OHZ and electrolyte replacement needs.

Hydration Tracking for Competition

Player’s hydration status should be assessed 36hrs prior to the match to ensure their hydration is tracking well and they are close to or within their OHZ.

- Players who are not within their green hydrated range should be advised to increase hydration consistently over the next 24hrs and be re-tested several hours before kick off to ensure hydration status has improved and the player is on track to be optimally hydrated at the beginning of the game.