

# RED-S CAT™

## Relative Energy Deficiency in Sport (RED-S) Clinical Assessment Tool (CAT)

For use by medical professionals only



Name \_\_\_\_\_

Date: \_\_\_\_\_

Examiner: \_\_\_\_\_

### What is the RED-S CAT?

The RED-S CAT is a clinical assessment tool for the evaluation of athletes/active individuals suspected of having relative energy deficiency and for guiding return to play decisions. The RED-S CAT is designed for use by a medical professional in the clinical evaluation and management of athletes with this syndrome. The RED-S CAT is based on the IOC Consensus Statement on RED-S, 2014.<sup>1</sup>

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**NOTE:** The diagnosis of RED-S is a medical diagnosis to be made by a trained health care professional. Clinical management and return to play decisions for athletes with RED-S should occur under the guidance of an experienced sports medicine team.

### What is Relative Energy Deficiency in Sport?

The syndrome of RED-S refers to impaired physiological functioning caused by relative energy deficiency, and includes but is not limited to impairments of metabolic rate, menstrual function, bone health, immunity, protein synthesis, and cardiovascular health.

The cause of RED-S is the scenario termed "low energy availability", where an individual's dietary energy intake is insufficient to support the energy expenditure required for health, function, and daily living, once the cost of exercise and sporting activities is taken into account.

The potential health consequences of RED-S are depicted in the RED-S conceptual model (See Figure 1). Psychological problems can be both the result of and the cause of RED-S.

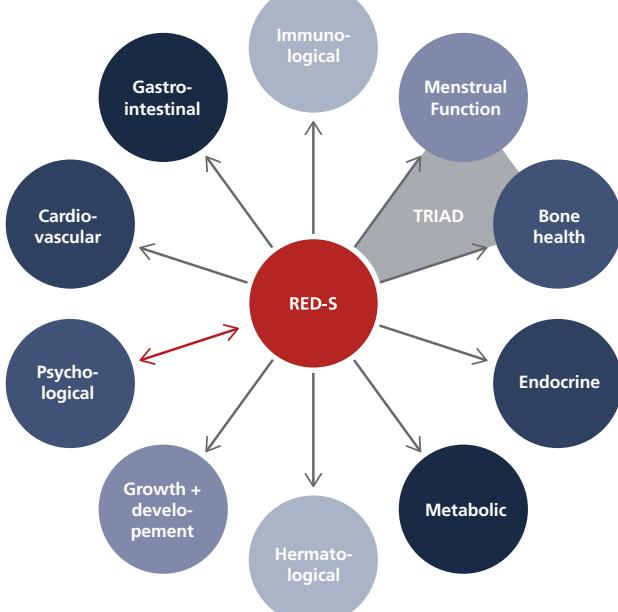


Figure 1

RED-S may also affect athlete sport performance. The potential effects of RED-S on sport performance are illustrated in Figure 2:

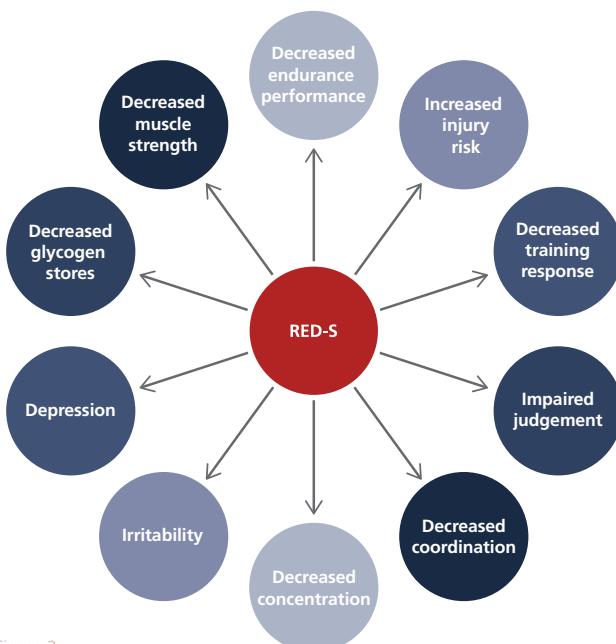


Figure 2

### Screening for RED-S

The screening and diagnosis of RED-S is challenging, as symptomatology can be subtle. A special focus on the athlete at risk is needed. Although any athlete can suffer from RED-S, those at particular risk are those in judged sports with an emphasis on the aesthetic or appearance, weight category sports, and endurance sports. Early detection is of importance to maintain and improve performance and prevent long-term health consequences.

Screening for RED-S can be undertaken as part of an annual Periodic Health Examination and when an athlete presents with Disordered Eating (DE)/Eating Disorders (ED), weight loss, lack of normal growth and development, endocrine dysfunction, recurrent injuries and illnesses, decreased performance/performance variability or mood changes.

## RED-S Risk Assessment Model for sport participation

This model can be incorporated into the Periodic Health Examination. Depending on the findings on history and physical examination, the athlete is classified into one of the 3 following categories: **"Red Light"**: High risk, **"Yellow Light"**: Moderate risk, **"Green Light"**: Low Risk.

HIGH RISK: NO START RED LIGHT	MODERATE RISK: CAUTION YELLOW LIGHT	LOW RISK: GREEN LIGHT
- Anorexia nervosa and other serious eating disorders - Other serious medical (psychological and physiological) conditions related to low energy availability - Use of extreme weight loss techniques leading to dehydration induced hemodynamic instability and other life threatening conditions.	- Prolonged abnormally low % body fat measured by DXA* or anthropometry - Substantial weight loss (5–10 % body mass in one month) - Attenuation of expected growth and development in adolescent athlete	- Appropriate physique that is managed without undue stress or unhealthy diet/exercise strategies
	- Low **EA of prolonged and/or severe nature	- Healthy eating habits with appropriate EA
	- Abnormal menstrual cycle: functional hypothalamic amenorrhea > 3 months - No menarche by age 15y in females	- Healthy functioning endocrine system
	- Reduced bone mineral density (either in comparison to prior DXA or Z-score <-1 SD). - History of 1 or more stress fractures associated with hormonal/menstrual dysfunction and/or low EA	- Healthy bone mineral density as expected for sport, age and ethnicity - Healthy musculoskeletal system
- Severe ECG abnormalities (i.e. bradycardia)	- Athletes with physical/psychological complications related to low EA+/-disordered eating; - Diagnostic testing abnormalities related to low EA +/-disordered eating	
	- Prolonged relative energy deficiency - Disordered eating behavior negatively affecting other team members - Lack of progress in treatment and/or non-compliance	

\* dual energy X-ray absorptiometry

\*\*EA: Energy availability=Energy intake – Energy cost of exercise (additional energy expended in undertaking exercise).

### NOTES on diagnostic tools for Low EA:

Although low EA is a key factor in RED-S, at the present time there is no standardised protocol for undertaking an assessment of EA in free-living athletes. Some sports nutrition experts may have developed tools to monitor EA in which they have confidence, and may use these to screen for problems or guide dietary counselling. However, a universal recommendation to measure EA is unwise in the absence of a protocol that is sensitive, reliable, time-efficient and cost-effective.

## Sport Participation based on Risk Category

### "High Risk - Red Light": no clearance for sport participation.

Due to the severity of his/her clinical presentation, sport participation may pose serious jeopardy to his/her health and may also distract the athlete from devoting the attention needed for treatment and recovery.

### "Moderate Risk -Yellow Light": cleared for sport participation only with supervised participation and a medical treatment plan.

Re-evaluation of the athlete's risk assessment should occur at regular intervals of 1–3 months depending on the clinical scenario to assess compliance and to detect changes in clinical status.

### "Low Risk – Green Light": full sport participation.

## Treatment of Relative Energy Deficiency in Sport (RED-S)

Athletes categorized in the red light and yellow light zones should receive medical evaluation and treatment. The treatment of RED-S should be undertaken by a team of health professionals including a sports medicine physician, sports dietician, exercise physiologist, athletic therapist or trainer, sports psychologist/sports psychiatrist as needed. Patient confidentiality must be maintained. Treatment should focus on correcting the relative energy deficit through increasing energy intake and/or decreasing energy output. Intake of nutrients and other vitamins should follow established guidelines. Repeat assessment of BMD should occur at intervals of 6–12 months, depending on clinical presentation and initial values.

The use of an athlete contract is also recommended. (See Appendix)

## Relative Energy Deficiency in Sport (RED-S) risk assessment decision making steps for determining readiness for returning to play

Prior to returning an athlete to sport/physical activity following time away for RED-S treatment, an assessment of the athlete's health and the requirements of his/her sport should be undertaken following the step-wise approach:

STEPS	RISK MODIFIERS	CRITERIA	RED-S SPECIFIC CRITERIA
<b>STEP 1</b> Evaluation of Health Status	MEDICAL FACTORS		<ul style="list-style-type: none"> <li>- Patient Demographics</li> <li>- Symptoms</li> <li>- Medical History</li> <li>- Signs</li> <li>- Diagnostic Tests</li> <li>- Psychological Health</li> <li>- Potential Seriousness</li> </ul>
<b>STEP 2</b> Evaluation of Participation Risk	SPORT RISK MODIFIERS		<ul style="list-style-type: none"> <li>- Type of Sport</li> <li>- Position Played</li> <li>- Competitive Level</li> </ul>
<b>STEP 3</b> Decision Modification	DECISION MODIFIERS		<ul style="list-style-type: none"> <li>- Timing and Season</li> <li>- Pressure from Athlete</li> <li>- External Pressure</li> <li>- Conflict of Interest</li> <li>- Fear of Litigation</li> </ul>

## Return to Play Model

Following clinical reassessment utilizing the 3 step evaluation outlined above, athletes can be re-classified into the **"High Risk – Red Light"**, **"Moderate Risk – Yellow Light"** or **"Low Risk – Green Light"** categories. The RED-S Risk Assessment Model is adapted to aid clinicians' decision making for determining an athlete's readiness to return to sport/physical activity.

The RED-S **Return to Play Model** outlines the sport activity recommended for each risk category.

HIGH RISK RED LIGHT	MODERATE RISK YELLOW LIGHT	LOW RISK GREEN LIGHT
<ul style="list-style-type: none"> <li>- No competition</li> <li>- No training</li> <li>- Use of written contract</li> </ul>	<ul style="list-style-type: none"> <li>- May train as long as he/she is following the treatment plan</li> <li>- May compete once medically cleared under supervision</li> </ul>	<ul style="list-style-type: none"> <li>- Full sport participation</li> </ul>

## APPENDIX

### Relative Energy Deficiency in Sport (RED-S) Treatment Contract

RED-S Treatment Contract for \_\_\_\_\_

#### Multidisciplinary Team:

- (Physician) \_\_\_\_\_
- (Psychotherapist/Psychiatrist) \_\_\_\_\_
- (Exercise physiologist) \_\_\_\_\_
- (Dietitian) \_\_\_\_\_
- (Other) \_\_\_\_\_

#### Requirements

Meet with:

- The psychotherapist at intervals recommended by the health professional treatment team
- The dietitian at intervals recommended by the health professional treatment team
- The physician at intervals recommended by the health professional treatment team
- Follow daily meal plan developed by the health professional treatment team
- Follow the adapted training plan developed by the health professional treatment team
- If underweight, weight gain expected to be \_\_\_\_\_ kg per week/weight stable within week \_\_\_\_\_
- If underweight, must achieve minimal acceptable body weight/fat of \_\_\_\_\_ kg/percent by \_\_\_\_\_
- Regular weigh-in at the following time intervals of \_\_\_\_\_ week(s)
- After this date, \_\_\_\_\_ (dd/mm/yyyy), must maintain weight and % fat at or above minimal acceptable body weight/fat mass of \_\_\_\_\_ (kg/%)
- Other \_\_\_\_\_

If **ALL** requirements are met and the eating behavior (and other severe conditions) are normalized the Team Physician will decide if cleared for competition.

I, \_\_\_\_\_ have read this contract and all of my questions were answered.

Athlete Name \_\_\_\_\_

Athlete Signature \_\_\_\_\_

Date \_\_\_\_\_

Team Physician Name \_\_\_\_\_

Team Physician Signature \_\_\_\_\_

Date \_\_\_\_\_

#### References

Mountjoy M, Sundgot-Borgen J, Burke L, et al. IOC Consensus Statement. Beyond the Triad – RED-S in sport. Br J Sports Med. 2014; 48: 491-7.

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# RED-S CAT™

## Instrument zur klinischen Beurteilung des relativen Energiedefizits im Sport (RED-S CAT)



Nur zur Verwendung durch medizinische Fachleute

Name:

Datum:

Untersucher:

### Was ist das RED-S CAT?

Das RED-S CAT ist ein klinisches Instrument zur Beurteilung von Athlet/innen bzw. aktiven Individuen, bei denen man einen relativen Energiedefizit vermutet, sowie zur Unterstützung bei der Entscheidung bezüglich ihrer Rückkehr zum Sport. Das RED-S CAT ist so konzipiert, dass eine medizinische Fachperson es in der klinischen Beurteilung und Behandlung von Athlet/innen mit diesem Syndrom einsetzen kann. Das RED-S CAT basiert auf den IOK Konsens über das RED-S, 2014.<sup>1</sup>

Dieses Instrument darf in seiner aktuellen Form durch Sportverbände und medizinische Dienstleistende im Umfeld von Athlet/innen frei genutzt werden. Änderungen des Instruments sowie Vervielfältigung zu Publikationszwecken bedürfen der Zustimmung durch das Internationale Olympische Komitee.

**MERKE:** Die RED-S Diagnose ist eine medizinische Diagnose und muss durch eine ausgebildete Gesundheitsfachperson erfolgen. Die klinische Behandlung und die Entscheidung zur Rückkehr zum Sport von Athlet/innen mit RED-S sollten unter der Leitung eines erfahrenen Sportmedizin Teams stehen.

### Was ist ein relatives Energiedefizit im Sport?

Das RED-S Syndrom bezieht sich auf eine beeinträchtigte physiologische Funktion, welche ein relatives Energiedefizit als Ursache hat, und unter anderem eine Beeinträchtigung von Stoffwechselumsatz, Menstruationsfunktion, Knochengesundheit, Immunsystem, Proteinsynthese und kardiovaskulärer Gesundheit beinhaltet.

Die Ursache der RED-S ist ein als «niedrige Energieverfügbarkeit» bezeichnetes Szenario. Die Energieaufnahme über die Nahrung reicht dann nicht aus, um den Energieverbrauch für die Gesundheit, Körperfunktion und das tägliche Leben sicherzustellen, sobald der Energieverbrauch für physische und sportliche Aktivitäten berücksichtigt wurde.

Die möglichen gesundheitlichen Folgen des RED-S sind im konzeptionellen RED-S Modell dargestellt (Abbildung 1). Psychische Probleme können sowohl das Ergebnis wie auch die Ursache des RED-S sein.

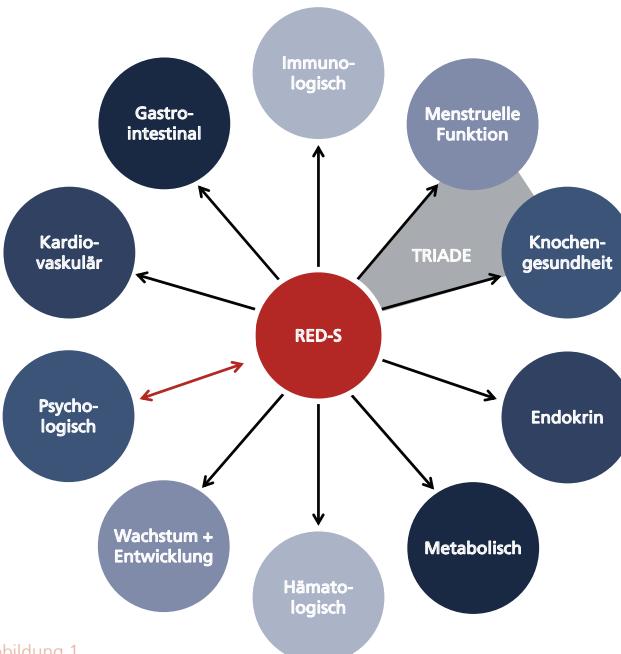


Abbildung 1

Das RED-S kann auch die sportliche Leistungsfähigkeit beeinflussen. Die potenziellen Auswirkungen des RED-S auf die sportliche Leistung sind in der folgenden Abbildung 2 veranschaulicht:

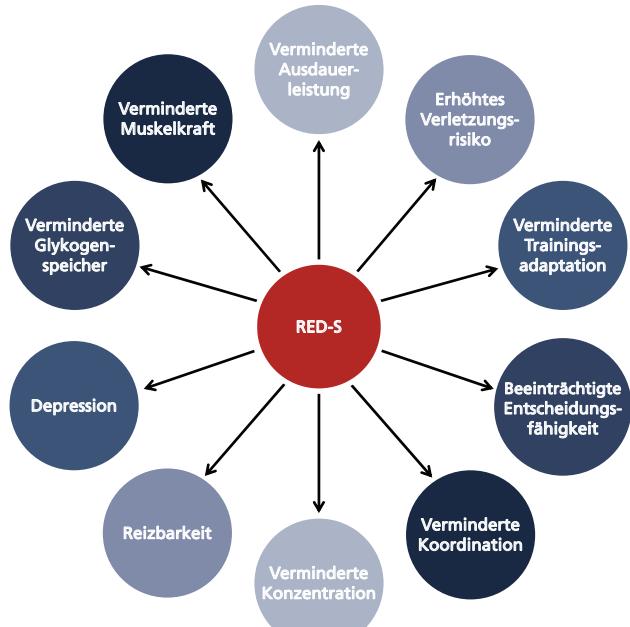


Abbildung 2

### Screening des RED-S

Screening und Diagnose des RED-S sind herausfordernd, da die Symptomatik schwierig sein kann. Es bedarf eines besonderen Augenmerks bei möglicherweise betroffenen Athlet/innen. Obwohl alle Athlet/innen an RED-S leiden können, sind diejenigen besonders gefährdet, welche eine der folgenden Sportarten ausüben: durch Richter bewertete Sportart mit einem Schwerpunkt auf Ästhetik oder Erscheinung, Sportart mit Gewichtsklassen und Ausdauersportarten. Eine Früherkennung ist für die Erhaltung und Verbesserung der Leistung wichtig, wie auch zur Verhinderung von langfristigen Gesundheitsfolgen.

Das RED-S Screening kann als Teil einer jährlichen Gesundheitsuntersuchung durchgeführt werden und wenn ein Athlet sich mit gestörtem Essverhalten/Essstörung, Gewichtsverlust, eingeschränktem Wachstum und Entwicklung, endokrinen Störungen, wiederkehrenden Verletzungen und Krankheiten, verminderter Leistung/Leistungsvariabilität oder Stimmungsschwankungen präsentiert.

## RED-S Risikobewertungsmodell zur Sportteilnahme

Dieses Modell kann in die periodische Gesundheitsuntersuchung integriert werden. Der/Die Athlet/in wird je nach Befund der Anamnese und körperlichen Untersuchung in eine der 3 folgenden Kategorien eingeteilt: **«Rotes Licht»:** Hohes Risiko, **«Gelbes Licht»:** Moderates Risiko, **«Grünes Licht»:** Niedriges Risiko.

HOHES RISIKO: KEIN START ROTES LICHT	MODERATES RISIKO: VORSICHT GELBES LICHT	NIEDRIGES RISIKO: GRÜNES LICHT
<ul style="list-style-type: none"> <li>- Anorexia Nervosa und andere ernsthafte Essstörungen</li> <li>- Andere ernsthafte medizinische (psychologische und physiologische) Zustände in Zusammenhang mit einer niedrigen Energieverfügbarkeit</li> <li>- Verwendung von extremen Gewichtsverlust-Techniken, die zu einer dehydrationsbedingten, hämodynamischen Instabilität und anderen lebensbedrohenden Zuständen führen</li> </ul>	<ul style="list-style-type: none"> <li>- Anhaltend abnormal tiefer Körperfettanteil gemessen durch DXA* oder Anthropometrie</li> <li>- Substanzieller Gewichtsverlust (5-10 % der Körpermasse innerhalb eines Monats)</li> <li>- Vermindertes erwartetes Wachstum und Entwicklung bei jugendlichen Athlet/innen</li> </ul>	<ul style="list-style-type: none"> <li>- Angemessene Physis, welche ohne unnötigen Stress oder ungesunde Diät-/Bewegungsstrategien gehabt wird</li> </ul>
	<ul style="list-style-type: none"> <li>- Niedrige EV** anhaltender und/oder ernsthafter Natur</li> </ul>	<ul style="list-style-type: none"> <li>- Gesunde Essgewohnheiten mit angemessener Energieverfügbarkeit</li> </ul>
	<ul style="list-style-type: none"> <li>- Anormaler Menstruationszyklus: funktionelle hypothalamische Amenorrhö &gt;3 Monate</li> <li>- Bei Frauen keine Menarche im Alter von 15 Jahren</li> </ul>	<ul style="list-style-type: none"> <li>- Gesundes funktionierendes endokrines System</li> </ul>
	<ul style="list-style-type: none"> <li>- Reduzierte Knochendichte (entweder verglichen zu früheren DXA oder bei Z-Score &lt; -1 SD)</li> <li>- Athletengeschichte mit einer oder mehreren Stressfaktoren in Zusammenhang mit hormonellen oder menstruellen Dysfunktionen und / oder niedriger EV</li> </ul>	<ul style="list-style-type: none"> <li>- Gesunde Knochendichte, die gemäß Sportart, Alter und Ethnizität zu erwarten ist</li> <li>- Gesunder Bewegungsapparat</li> </ul>
<ul style="list-style-type: none"> <li>- Ernsthaftige EKG-Anomalien (d.h. Bradykardie)</li> </ul>	<ul style="list-style-type: none"> <li>- Athleten mit physischen/psychologischen Komplikationen in Zusammenhang mit einer niedrigen EV und/oder gestörttem Essverhalten</li> <li>- Diagnostische Anomalien im Zusammenhang mit einer niedrigen EV und/oder gestörtem Essverhalten</li> </ul>	
	<ul style="list-style-type: none"> <li>- Anhaltendes relatives Energiedefizit</li> <li>- Gestörtes Essverhalten mit negativem Einfluss auf andere Teammitglieder</li> <li>- Fehlender Fortschritt in der Behandlung und/oder fehlende Compliance</li> </ul>	

\* Dual energy X-ray Absorptiometry (Doppelröntgen-Absorptiometrie)

\*\*EV: Energieverfügbarkeit = Energieaufnahme – Energieverbrauch der physischen Aktivität (d.h. zusätzlich verbrauchte Energie bei der Bewegungsausführung).

### NOTIZEN für klinische Instrumente zur Ermittlung einer niedrigen EV:

Obwohl die niedrige EV ein Schlüsselfaktor beim RED-S ist, gibt es bislang kein standardisiertes Protokoll zur deren Ermittlung im Alltag der Athlet/innen. Fachleute in Sporternährung haben vielleicht Tools zur Beurteilung der EV entwickelt und nutzen diese für das Screening oder zur Steuerung der Ernährungsberatung. Dennoch ist eine universelle Empfehlung zur Messung der EV unvernünftig, solange kein sensitives, zuverlässiges, zeitsparendes und kosteneffektives Protokoll existiert.

### Sportteilnahme gemäß Risikokategorien

#### «Hohes Risiko – Rotes Licht»: Sportteilnahme nicht erlaubt.

Aufgrund der Schwere seiner klinischen Präsentation könnte eine Sportteilnahme die Gesundheit ernsthaft gefährden und auch den Athleten davon ablenken, die erforderliche Aufmerksamkeit der Behandlung und Erholung zu schenken.

#### «Moderates Risiko – Gelbes Licht»: Sportteilnahme erlaubt, aber nur unter Auflage einer begleiteten Teilnahme und eines medizinischen Behandlungsplans.

Die Neubewertung der Risikobewertung des/der Athleten/in sollte je nach klinischem Szenario in regelmäßigen Abständen von 1-3 Monaten erfolgen, um die Compliance zu beurteilen und Veränderungen im klinischen Status festzustellen.

#### «Niedriges Risiko – Grünes Licht»: Sportteilnahme ohne Einschränkung.

## Behandlung des relativen Energiedefizits im Sport (RED-S)

Athlet/innen im roten oder gelben Bereich sollten medizinisch untersucht und behandelt werden. Die Behandlung von RED-S sollte durch ein Team von Gesundheitsfachleuten erfolgen. Gemäß Bedarf enthält dieses Team einen Sportmediziner, Sporternährungsberater, Sportphysiologen, Sportphysiotherapeuten oder Trainer und Sportpsychologen/Sportpsychiater. Die Behandlung sollte sich auf die Korrektur des relativen Energiedefizits durch Steigerung der Energiezufuhr und/oder Senkung des Energieverbrauchs konzentrieren und die medizinische Schweigepflicht muss dabei eingehalten werden. Die Aufnahme von Vitaminen und anderen Nährstoffen sollte gemäß festgelegten Richtlinien erfolgen. Eine erneute Messung der Knochendichte sollte in Abständen von 6-12 Monaten erfolgen, abhängig von der klinischen Präsentation und den Ausgangswerten.

Der Einsatz eines Vertrags mit dem/der Athleten/in wird ebenfalls empfohlen. (Siehe Anhang).

## RED-S Entscheidungsschritte für die Risikobewertung zur Ermittlung der Eignung zur Rückkehr in den Sport

Vor der Rücksendung eines Athleten zum Sport/zur physischen Aktivität nach Abwesenheit wegen einer RED-S Behandlung sollte eine Beurteilung der Gesundheit des Athleten/der Athletin und der Anforderungen seiner/ihrer Sportart gemäß des folgenden schrittweisen Ansatzes erfolgen:

SCHRITTE	RISIKO-FAKTOREN	KRITERIEN	RED-S SPEZIFISCHE KRITERIEN
<b>1. SCHRITT</b> Bewertung des Gesundheitszustands	MEDIZINISCHE FAKTOREN	<ul style="list-style-type: none"> <li>- Demographie des Patienten</li> <li>- Symptome</li> <li>- Medizinische Geschichte</li> <li>- Vorzeichen</li> <li>- Diagnostische Tests</li> <li>- Psychologische Gesundheit</li> <li>- Potenzielle Ernsthaftigkeit</li> </ul>	<ul style="list-style-type: none"> <li>- Alter, Geschlecht</li> <li>- Siehe Spalte «Gelbes Licht» im RED-S Risikobewertungsmodell</li> <li>- Wiederkehrende Diäten, menstruelle Gesundheit, Knochengesundheit</li> <li>- Gewichtsverlust/-fluktuationen, Schwäche</li> <li>- Hormone, Elektrolyte, Elektrokardiogramm, DXA</li> <li>- Depression, Angst, gestörtes Essverhalten/Essstörungen</li> <li>- Abnormale hormonelle und metabolische Funktion</li> <li>- Herzrhythmusstörungen</li> <li>- Stressfraktur</li> </ul>
<b>2. SCHRITT</b> Bewertung des Teilnehmeriskos	RISIKO-FAKTOREN DES SPORTES	<ul style="list-style-type: none"> <li>- Sportart</li> <li>- Spielposition</li> <li>- Wettkampfniveau</li> </ul>	<ul style="list-style-type: none"> <li>- Gewichtssensitiver Sport/Sportart, in der Untergewicht ausgeprägt ist</li> <li>- Individual- vs. Teamsport</li> <li>- Spitzens- vs. Freizeitsport</li> </ul>
<b>3. SCHRITT</b> Entscheidungsmodifikation	ENTSCHEIDUNGSMODIFIKATOREN	<ul style="list-style-type: none"> <li>- Zeitpunkt und Saison</li> <li>- Druck vom Athlet/in</li> <li>- Äußerer Druck</li> <li>- Interessenkonflikt</li> <li>- Angst vor Rechtsstreit</li> </ul>	<ul style="list-style-type: none"> <li>- Innerhalb/ außerhalb der Saison, Reise, Umweltfaktoren</li> <li>- Mentale Wettkampfbereitschaft</li> <li>- Trainer, Teambesitzer, Athletenfamilie, Sponsorenunterstützung</li> <li>- Falls Wettkampfeinschränkung vorliegend</li> </ul>

## Modell für die Rückkehr zum Sport

Nach erneuter klinischen Beurteilung unter Verwendung der obigen, schrittweisen Beurteilung können Athlet/innen wieder gemäß den drei Kategorien **«Hohes Risiko – Rotes Licht»**, **«Moderates Risiko – Gelbes Licht»** oder **«Niedriges Risiko – Grünes Licht»** eingestuft werden. Das RED-S Risikobewertungsmodell ist eine Entscheidungshilfe für Mediziner für die Bestimmung der Eignung der Rückkehr zum Sport/ zur physischen Aktivität eines/einer Athleten/Athletin.

Das **Modell für die Rückkehr zum Sport** nach RED-S beschreibt die empfohlene sportliche Aktivität gemäß Risikokategorie.

HOHES RISIKO ROTES LICHT	MODERATES RISIKO GELBES LICHT	NIEDRIGES RISIKO GRÜNES LICHT
<ul style="list-style-type: none"> <li>- Kein Wettkampf</li> <li>- Kein Training</li> <li>- Verwendung eines schriftlichen Vertrags</li> </ul>	<ul style="list-style-type: none"> <li>- Kann solange trainieren, wie sie/er den Behandlungsplan folgt</li> <li>- Kann nach medizinischer Freigabe unter Begleitung an Wettkämpfen teilnehmen</li> </ul>	<ul style="list-style-type: none"> <li>- Uneingeschränkte Sportteilnahme</li> </ul>

# ANHANG

## Vertrag über die Behandlung des relativen Energiedefizits im Sport (RED-S)

Vertrag für die Behandlung von RED-S für \_\_\_\_\_

### Multidisziplinäres Team:

- (Mediziner) \_\_\_\_\_
- (Psychologe/Psychiater) \_\_\_\_\_
- (Sportphysiologe) \_\_\_\_\_
- (Sporternährungsberater) \_\_\_\_\_
- (Andere) \_\_\_\_\_

### Auflagen

- Treffen mit dem Psychologen in Abständen, die vom Behandlungsteam der Gesundheitsfachleute empfohlen sind
- Treffen mit dem Sporternährungsberater in Abständen, die vom Behandlungsteam der Gesundheitsfachleute empfohlen sind
- Treffen mit dem Mediziner in Abständen, die vom Behandlungsteam der Gesundheitsfachleute empfohlen sind
- Den täglichen Essensplan folgen, der vom Behandlungsteam der Gesundheitsfachleute entwickelt wurde
- Den täglichen Trainingsplan folgen, der vom Behandlungsteam der Gesundheitsfachleute entwickelt wurde
- Falls untergewichtig, wird eine Gewichtszunahme von \_\_\_\_\_ kg pro Woche/ein stabiles Gewicht innerhalb von \_\_\_\_\_ Wochen erwartet
- Falls untergewichtig, muss ein minimales, akzeptables Gewicht / Körperfettanteil von \_\_\_\_\_ kg/% innerhalb von \_\_\_\_\_ erzielt werden
- Regelmässiges wiegen in Abständen von \_\_\_\_\_ Woche(n)
- Nach dem \_\_\_\_\_ (TT/MM/JJJJ) muss das Gewicht und der % Körperfettanteil am minimalen, akzeptablen Wert von \_\_\_\_\_ (kg/%) oder darüber gehalten werden
- Anderes \_\_\_\_\_

Wenn **ALLE** Anforderungen erfüllt und das Essverhalten (und andere schweren Konditionen) normalisiert sind, wird der Teamarzt über die Freigabe für Wettkämpfe entscheiden.

Ich, \_\_\_\_\_, habe diesen Vertrag gelesen und alle meine Fragen wurden beantwortet.

Name Athlet/in \_\_\_\_\_

Unterschrift Athlet/in \_\_\_\_\_

Datum \_\_\_\_\_

Name Teamarzt \_\_\_\_\_

Unterschrift Teamarzt \_\_\_\_\_

Datum \_\_\_\_\_

### Literatur

Mountjoy M, Sundgot-Borgen J, Burke L, et al. IOC Consensus Statement. Beyond the Triad – RED-S in sport. Br J Sports Med. 2014; 48: 491-7.

### Beitragende Autoren

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# RED-S CAT™

## Relative Energy Deficiency in Sport (RED-S) Clinical Assessment Tool (CAT)



For use by medical professionals only

Name \_\_\_\_\_

Date: \_\_\_\_\_

Examiner: \_\_\_\_\_

### What is the RED-S CAT?

The RED-S CAT is a clinical assessment tool for the evaluation of athletes/active individuals suspected of having relative energy deficiency and for guiding return to play decisions. The RED-S CAT is designed for use by a medical professional in the clinical evaluation and management of athletes with this syndrome. The RED-S CAT is based on the IOC Consensus Statement on RED-S, 2014.<sup>1</sup>

This tool may be freely copied in its current form for use by sport organizations and the athlete medical team entourage. Alterations to the tool or reproduction for publication purposes require permission from the International Olympic Committee.

NOTE: The diagnosis of RED-S is a medical diagnosis to be made by a trained health care professional. Clinical management and return to play decisions for athletes with RED-S should occur under the guidance of an experienced sports medicine team.

### What is Relative Energy Deficiency in Sport?

The syndrome of RED-S refers to impaired physiological functioning caused by relative energy deficiency, and includes but is not limited to impairments of metabolic rate, menstrual function, bone health, immunity, protein synthesis, and cardiovascular health.

The cause of RED-S is the scenario termed “low energy availability”, where an individual’s dietary energy intake is insufficient to support the energy expenditure required for health, function, and daily living, once the cost of exercise and sporting activities is taken into account.

The potential health consequences of RED-S are depicted in the RED-S conceptual model (See Figure 1). Psychological problems can be both the result of and the cause of RED-S.

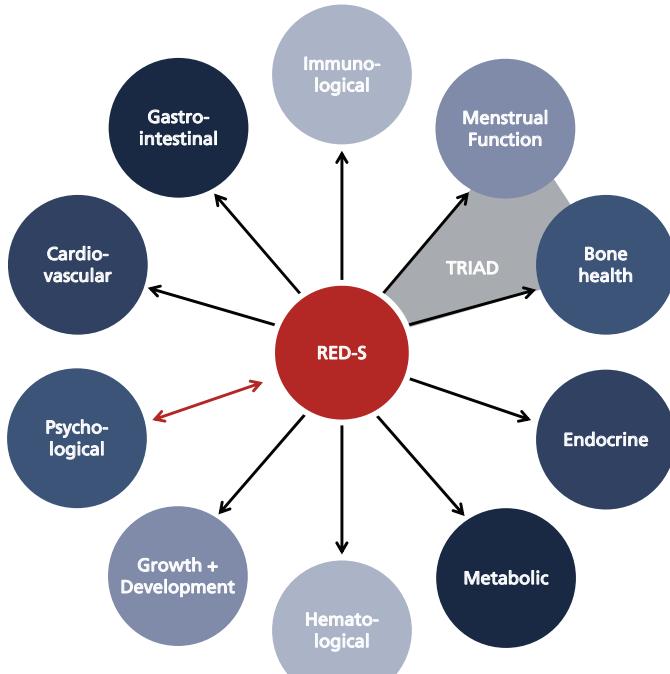


Figure 1

RED-S may also affect athlete sport performance. The potential effects of RED-S on sport performance are illustrated in Figure 2:

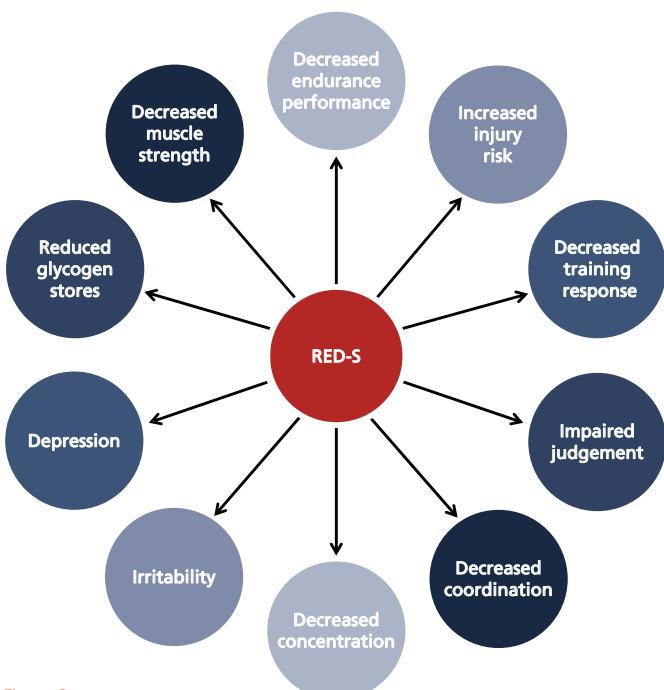


Figure 2

### Screening for RED-S

The screening and diagnosis of RED-S is challenging, as symptomatology can be subtle. A special focus on the athlete at risk is needed. Although any athlete can suffer from RED-S, those at particular risk are those in judged sports with an emphasis on the aesthetic or appearance, weight category sports, and endurance sports. Early detection is of importance to maintain and improve performance and prevent long-term health consequences.

Screening for RED-S can be undertaken as part of an annual Periodic Health Examination and when an athlete presents with Disordered Eating (DE)/Eating Disorders (ED), weight loss, lack of normal growth and development, endocrine dysfunction, recurrent injuries and illnesses, decreased performance/performance variability or mood changes.

## RED-S Risk Assessment Model for sport participation

This model can be incorporated into the Periodic Health Examination. Depending on the findings on history and physical examination, the athlete is classified into one of the 3 following categories: "Red Light": High risk, "Yellow Light": Moderate risk, "Green Light": Low Risk.

HIGH RISK: NO START RED LIGHT	MODERATE RISK: CAUTION YELLOW LIGHT	LOW RISK: GREEN LIGHT
- Anorexia nervosa and other serious eating disorders - Other serious medical (psychological and physiological) conditions related to low energy availability - Use of extreme weight loss techniques leading to dehydration induced hemodynamic instability and other life threatening conditions.	- Prolonged abnormally low % body fat measured by DXA* or anthropometry - Substantial weight loss (5–10% body mass in one month) - Attenuation of expected growth and development in adolescent athlete	- Appropriate physique that is managed without undue stress or unhealthy diet/exercise strategies
	- Low **EA of prolonged and/or severe nature	- Healthy eating habits with appropriate EA
	- Abnormal menstrual cycle: functional hypothalamic amenorrhea >3 months - No menarche by age 15y in females	- Healthy functioning endocrine system
	- Reduced bone mineral density (either in comparison to prior DXA or Z-score <-1 SD). - History of 1 or more stress fractures associated with hormonal/menstrual dysfunction and/or low EA	- Healthy bone mineral density as expected for sport, age and ethnicity - Healthy musculoskeletal system
- Severe ECG abnormalities (i.e. bradycardia)	- Athletes with physical/psychological complications related to low EA+/-disordered eating; - Diagnostic testing abnormalities related to low EA+/-disordered eating	
	- Prolonged relative energy deficiency - Disordered eating behavior negatively affecting other team members - Lack of progress in treatment and/or non-compliance	

\* dual energy X-ray absorptiometry

\*\*EA: Energy availability=Energy intake – Energy cost of exercise (additional energy expended in undertaking exercise).

### NOTES on diagnostic tools for Low EA:

Although low EA is a key factor in RED-S, at the present time there is no standardised protocol for undertaking an assessment of EA in free-living athletes. Some sports nutrition experts may have developed tools to monitor EA in which they have confidence, and may use these to screen for problems or guide dietary counselling. However, a universal recommendation to measure EA is unwise in the absence of a protocol that is sensitive, reliable, time-efficient and cost-effective.

## Sport Participation based on Risk Category

### "High Risk - Red Light": no clearance for sport participation.

Due to the severity of his/her clinical presentation, sport participation may pose serious jeopardy to his/her health and may also distract the athlete from devoting the attention needed for treatment and recovery.

### "Moderate Risk -Yellow Light": cleared for sport participation only with supervised participation and a medical treatment plan.

Re-evaluation of the athlete's risk assessment should occur at regular intervals of 1–3 months depending on the clinical scenario to assess compliance and to detect changes in clinical status.

### "Low Risk – Green Light": full sport participation.

## Treatment of Relative Energy Deficiency in Sport (RED-S)

Athletes categorized in the red light and yellow light zones should receive medical evaluation and treatment. The treatment of RED-S should be undertaken by a team of health professionals including a sports medicine physician, sports dietician, exercise physiologist, athletic therapist or trainer, sports psychologist/sports psychiatrist as needed. Patient confidentiality must be maintained. Treatment should focus on correcting the relative energy deficit through increasing energy intake and/or decreasing energy output. Intake of nutrients and other vitamins should follow established guidelines. Repeat assessment of BMD should occur at intervals of 6–12 months, depending on clinical presentation and initial values.

The use of an athlete contract is also recommended. (See Appendix)

## Relative Energy Deficiency in Sport (RED-S) risk assessment decision making steps for determining readiness for returning to play

Prior to returning an athlete to sport/physical activity following time away for RED-S treatment, an assessment of the athlete's health and the requirements of his/her sport should be undertaken following the step-wise approach:

STEPS	RISK MODIFIERS	CRITERIA	RED-S SPECIFIC CRITERIA
<b>STEP 1</b> Evaluation of Health Status	MEDICAL FACTORS	- Patient Demographics - Symptoms - Medical History - Signs - Diagnostic Tests - Psychological Health - Potential Seriousness	- Age, sex - See Yellow Light column in RED-S Risk assessment model - Recurrent dieting, menstrual health, bone health - Weight loss/fluctuations, weakness - Hormones, electrolytes, electrocardiogram, DXA - Depression, anxiety, disordered eating/eating disorder - Abnormal hormonal and metabolic function - Cardiac arrhythmia - Stress fracture
<b>STEP 2</b> Evaluation of Participation Risk	SPORT RISK MODIFIERS	- Type of Sport - Position Played - Competitive Level	- Weight sensitive, leanness sport - Individual vs. team sport - Elite vs. recreational
<b>STEP 3</b> Decision Modification	DECISION MODIFIERS	- Timing and Season - Pressure from Athlete - External Pressure - Conflict of Interest - Fear of Litigation	- In/out of season, travel, environmental factors - Mental readiness to compete - Coach, team owner, athlete family, sponsors support - If restricted from competition

## Return to Play Model

Following clinical reassessment utilizing the 3 step evaluation outlined above, athletes can be re-classified into the "High Risk – Red Light", "Moderate Risk – Yellow Light" or "Low Risk – Green Light" categories. The RED-S Risk Assessment Model is adapted to aid clinicians' decision making for determining an athlete's readiness to return to sport/physical activity.

The RED-S Return to Play Model outlines the sport activity recommended for each risk category.

HIGH RISK RED LIGHT	MODERATE RISK YELLOW LIGHT	LOW RISK GREEN LIGHT
- No competition - No training - Use of written contract	- May train as long as he/she is following the treatment plan - May compete once medically cleared under supervision	- Full sport participation

## APPENDIX

### Relative Energy Deficiency in Sport (RED-S) Treatment Contract

RED-S Treatment Contract for \_\_\_\_\_

#### Multidisciplinary Team:

- (Physician) \_\_\_\_\_  
 (Psychotherapist/Psychiatrist) \_\_\_\_\_  
 (Exercise physiologist) \_\_\_\_\_  
 (Dietitian) \_\_\_\_\_  
 (Other) \_\_\_\_\_

#### Requirements

Meet with:

- The psychotherapist at intervals recommended by the health professional treatment team  
 The dietitian at intervals recommended by the health professional treatment team  
 The physician at intervals recommended by the health professional treatment team  
 Follow daily meal plan developed by the health professional treatment team  
 Follow the adapted training plan developed by the health professional treatment team  
 If underweight, weight gain expected to be \_\_\_\_\_ kg per week/weight stable within week \_\_\_\_\_  
 If underweight, must achieve minimal acceptable body weight/fat of \_\_\_\_\_ kg/percent by \_\_\_\_\_  
 Regular weigh-in at the following time intervals of \_\_\_\_\_ week (s)  
 After this date, \_\_\_\_\_ (dd/mm/yyyy), must maintain weight and % fat at or above minimal acceptable body weight/fat mass of \_\_\_\_\_ (kg/%)  
 Other \_\_\_\_\_

If **ALL** requirements are met and the eating behavior (and other severe conditions) are normalized the Team Physician will decide if cleared for competition.

I, \_\_\_\_\_

have read this contract and all of my questions were answered.

Athlete Name \_\_\_\_\_

Athlete Signature \_\_\_\_\_

Date \_\_\_\_\_

Team Physician Name \_\_\_\_\_

Team Physician Signature \_\_\_\_\_

Date \_\_\_\_\_

#### References

Mountjoy M, Sundgot-Borgen J, Burke L, et al. IOC Consensus Statement. Beyond the Triad – RED-S in sport. Br J Sports Med. 2014; 48: 491-7.

#### Contributing Authors

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# RED-S CAT™

## Outil d'évaluation clinique du déficit énergétique relatif dans le sport (RED-S CAT)

A l'usage des professionnels du domaine médical uniquement



Nom:

Date:

Examinateur:

### Qu'est-ce que le RED-S CAT?

Le RED-S CAT (Relative Energy Deficiency in Sport Clinical Assessment Tool) est un outil d'évaluation clinique pour évaluer les athlètes ou individus actifs suspectés de déficit énergétique relatif et pour aider lors de décisions de retour à la compétition. Le RED-S est conçu pour être utilisé par les professionnels de la santé dans l'examen clinique et la prise en charge d'athlètes présentant ce syndrome. Le RED-S CAT est basé sur la déclaration du consensus du Comité International Olympique (CIO) sur le RED-CAT, 2014.<sup>1</sup>

Cet outil peut être librement copié dans sa forme courante pour une utilisation par les organisations sportives et les équipes médicales entourant l'athlète. Toute modification ou reproduction à des fins de publication nécessitent l'autorisation du CIO.

**NOTE :** Un diagnostic RED-S est un diagnostic médical qui doit être posé par des professionnels de la santé qualifiés. La prise en charge clinique et la décision du retour à la compétition de l'athlète avec RED-S doivent être effectuées sous l'égide d'une équipe de médecine du sport expérimentée.

### Qu'est-ce que le déficit énergétique relatif dans le sport?

Le syndrome de RED-S est un fonctionnement physiologique altéré causé par un déficit énergétique relatif et comprend, entre autres, une détérioration du métabolisme basal, du cycle menstruel, de la santé osseuse, de la synthèse protéique et de la santé cardiovasculaire.

RED-S est causé par une «disponibilité énergétique basse», quand l'apport énergétique d'un individu est insuffisant pour couvrir la dépense d'énergie nécessaire à la santé, au fonctionnement et à la vie quotidienne, une fois le coût énergétique des activités sportives pris en compte.

Les conséquences possibles du RED-S sur la santé sont illustrées dans son modèle conceptuel (Figure 1). Les problèmes psychologiques peuvent autant être le résultat que la cause de RED-S.

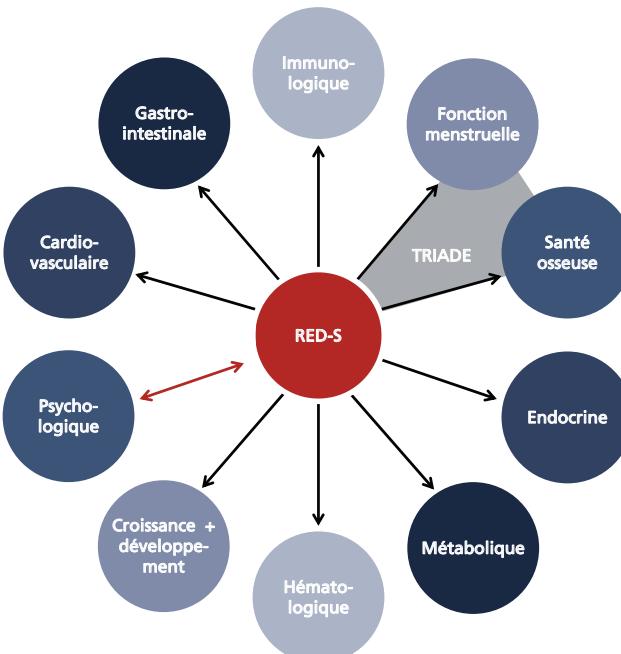


Figure 1

RED-S peut aussi affecter la performance sportive de l'athlète. Les effets possibles de RED-S sur la performance sportive sont représentés dans la figure 2 :

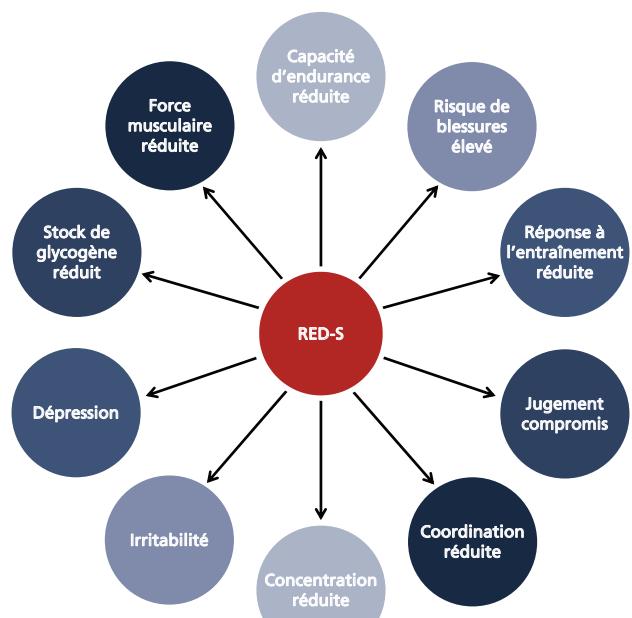


Figure 2

### Dépistage de RED-S

Le dépistage et le diagnostic de RED-S sont difficiles car la symptomatologie peut être subtile. Une attention particulière doit être apportée aux athlètes à risque. Bien que tout athlète puisse souffrir de RED-S, les athlètes particulièrement exposés sont ceux qui pratiquent des sports jugés comme ayant un aspect esthétique, des sports à catégories de poids et des sports d'endurance. Une détection précoce permet de maintenir et d'améliorer la performance ainsi que de prévenir les conséquences sur la santé à long terme.

Le dépistage de RED-S peut être effectué dans le cadre d'un examen médical périodique annuel et aussi lorsqu'un athlète présente une perte de poids, une croissance et un développement anormal, un dysfonctionnement endocrinien, des blessures ou des maladies chroniques, une diminution/variation de la performance ou des sauts d'humeur, accompagnés de conduites alimentaires perturbées ou de troubles du comportement alimentaire.

## Modèle RED-S d'évaluation des risques pour la participation au sport

Ce modèle peut être incorporé dans l'examen médical périodique. En fonction des antécédents et de l'examen physique, l'athlète est classé dans une des 3 catégories suivantes : **«Feu Rouge»**: Risque élevé, **«Feu Jaune»**: Risque modéré, **«Feu Vert»**: Risque faible.

RISQUE ÉLEVÉ : PAS DE PARTICIPATION FEU ROUGE	RISQUE MODÉRÉ : PRUDENCE FEU JAUNE	RISQUE FAIBLE : FEU VERT
- Anorexie mentale et autres troubles du comportement alimentaire sérieux - Autres affections médicales sérieuses (psychologiques et physiologiques) en lien avec une disponibilité énergétique basse - Utilisation de techniques extrêmes de perte de poids menant à la déshydratation et à l'instabilité hémodynamique ainsi qu'à d'autres situations potentiellement mortelles	- Pourcentage de graisse corporelle anormalement bas mesuré par anthropométrie ou par DXA* sur une période prolongée - Perte de poids substantielle (5-10 % de masse corporelle en un mois) - Ralentissement de croissance et de développement de l'athlète adolescent	- Physique approprié qui est géré sans stress excessif, alimentation mal-saine ou stratégies d'exercice
	- DE** basse prolongée et/ou sévère	- Habitudes alimentaires saines avec DE appropriée
	- Cycle menstruel anormal : aménorrhée hypothalamique fonctionnelle > 3 mois - Absence de ménarche jusqu'à 15 ans chez les femmes	- Fonctionnement du système endocrinien sain
	- Réduction de la densité minérale osseuse (en comparaison soit avec des résultats ultérieurs d'un DXA ou avec le score-Z < -1SD) - Antécédent de une ou plusieurs fractures de stress associée(s) à un dysfonctionnement hormonal / menstruel ou une DE basse	- Densité minérale osseuse saine correspondante à la discipline sportive, l'âge et l'ethnie - Système musculo-squelettique sain
- Sévères anomalies électrocardiographiques (c.-à-d. bradycardie)	- Athlètes présentant des complications physiques ou psychologiques en lien avec une DE basse / des conduites alimentaires perturbées - Anomalies au niveau de tests diagnostiques en lien avec une DE basse/ des conduites alimentaires perturbées	
	- Déficit énergétique relatif prolongé - Conduites alimentaires perturbées affectant négativement d'autres membres de l'équipe - Absence de progrès dans le traitement et/ou non-respect du traitement	

\* Dual energy X-ray Absorptiometry (Absorption biphotonique à rayons X)

\*\*DE: Disponibilité énergétique = apport énergétique – coût énergétique de l'activité (Surplus d'énergie dépensé pour l'activité physique).

### NOTES pour les outils de diagnostic concernant une DE basse :

Bien qu'une disponibilité énergétique basse soit un facteur-clé de RED-S, il n'existe, pour le moment, aucun protocole standardisé pour évaluer l'énergie disponible chez un athlète *in vivo*. Certains experts en nutrition du sport ont peut-être développé des outils en lesquels ils croient pour calculer l'énergie disponible et les utilisent pour dépister des problèmes ou les guider pour les conseils diététiques. Cependant, une recommandation universelle pour mesurer l'énergie disponible est imprudente en l'absence d'un protocole pertinent, fiable, efficace et rentable.

### Participation au sport basée sur les catégories de risques

#### «Risque élevé – Feu Rouge»: Pas d'autorisation de participation au sport.

En raison de la sévérité du tableau clinique, une participation au sport pourrait mettre en péril la santé de l'athlète ou détourner son attention consacrée à son traitement et à sa guérison.

#### «Risque modéré – Feu Jaune»: Apte à la participation sportive uniquement sous surveillance et avec plan de traitement médical.

Une réévaluation des risques de participation doit être répétée à des intervalles réguliers de 1-3 mois en fonction du scénario clinique afin d'attester la conformité et de détecter des changements dans le statut clinique.

#### «Risque faible – Feu Vert»: Pas de restriction de participation.

## Traitemennt du déficit énergétique relatif en sport (RED-S)

Les athlètes classés dans la catégorie «Feu Rouge» et «Feu Jaune» doivent bénéficier d'une évaluation médicale et d'un traitement médical. Le traitement du RED-S doit être entrepris par une équipe de professionnels de la santé comprenant, selon les besoins, un médecin du sport, un diététicien du sport, un physiologiste de l'exercice, un thérapeute sportif ou entraîneur, un psychologue du sport / psychiatre du sport. La confidentialité du patient doit être maintenue. Le traitement doit corriger le déficit énergétique relatif en augmentant l'apport énergétique et/ou en diminuant la dépense énergétique. L'apport de vitamines ou d'autres nutriments doit suivre les lignes directrices établies. Une mesure répétée de la densité minérale osseuse doit avoir lieu à intervalles réguliers de 6-12 mois, selon le tableau clinique et les valeurs initiales.

Le recours à un contrat avec l'athlète est aussi recommandé. (Voir annexe).

## Étapes du processus de prise de décision dans l'évaluation des risques dus au déficit énergétique relatif dans le sport (RED-S) pour déterminer le retour à la compétition

Avant d'autoriser un athlète à reprendre son activité physique/sport après un traitement de RED-S, l'évaluation de l'état de santé de l'athlète et les exigences de son sport doivent être considérées selon l'approche par étapes suivante :

ÉTAPES	FACTEURS MODIFIANTS DE RISQUES	CRITÈRES	CRITÈRES SPÉCIFIQUES À RED-S
ÉTAPE 1 Évaluation de l'état de santé	FACTEURS MÉDICAUX	- Caractères démographiques du patient - Symptômes - Antécédents médicaux - Signes - Tests diagnostiques - Santé psychologique - Gravité potentielle	- Âge, sexe - Se référer à la colonne «Feu Jaune» du modèle de l'évaluation des risques - Régime récurrent, santé menstruelle, santé osseuse, - Perte / fluctuation du poids, faiblesses - Hormones, électrolytes, électrocardiogramme, DXA - Dépression, anxiété, conduites alimentaires perturbées / troubles du comportement alimentaire - Fonction hormonale / métabolique anormale - Arrythmie cardiaque - Fracture de stress
ÉTAPE 2 Évaluation des risques de participation	FACTEURS DE RISQUE LIÉS AU SPORT	- Type de sport - Position - Niveau de compétition	- Sport lié au poids, à la composition en masse maigre - Sport individuel vs sport d'équipe - Elite vs loisirs
ÉTAPE 3 Modification de la décision	FACTEURS INFLUENÇANT LA PRISE DE DÉCISION	- Timing & Saison - Pression de l'athlète - Pression externe - Conflit d'intérêt - Crainte des litiges	- Pendant / en dehors de la saison, voyage, facteurs environnementaux - Capacité mentale à la compétition - Coach, appartenance à l'équipe, famille de l'athlète, sponsors - Si interdit de compétition

## Modèle du retour à la compétition

Suite à la réévaluation clinique utilisant la marche à suivre de l'étape 3 décrite ci-dessus, les athlètes peuvent être reclasés dans une des 3 catégories **«Risque élevé – Feu Rouge»**, **«Risque modéré – Feu Jaune»** ou **«Risque faible – Feu Vert»**. Le modèle d'évaluation des risques dus à RED-S est adapté pour faciliter la prise de décision des cliniciens à déterminer la condition de l'athlète face à un retour à la compétition.

Le **modèle du retour à la compétition** de RED-S décrit l'activité physique recommandée pour chaque catégorie de risque

RISQUE ÉLEVÉ FEU ROUGE	RISQUE MODÉRÉ FEU JAUNE	RISQUE FAIBLE FEU VERT
- Pas de compétition - Pas d'entraînement - Recours à un contrat écrit	- Peut s'entraîner tant que le plan de traitement est respecté - Peut prendre part à la compétition si médicalement autorisé et sous surveillance	- Participation sans restriction à l'activité sportive

## ANNEXE

### Contrat de traitement du déficit relatif énergétique (RED-S)

Contrat de traitement du RED-S pour \_\_\_\_\_

#### Équipe multidisciplinaire :

- (Médecin) \_\_\_\_\_  
 (Psychothérapeute/Psychiatre) \_\_\_\_\_  
 (Physiologue de l'exercice) \_\_\_\_\_  
 (Diététicien) \_\_\_\_\_  
 (Autre) \_\_\_\_\_

#### Exigences

- Entrevue avec le psychothérapeute à intervalles réguliers comme convenu avec l'équipe médicale  
 Entrevue avec le diététicien à intervalles réguliers comme convenu avec l'équipe médicale  
 Entrevue avec le médecin à intervalles réguliers comme convenu avec l'équipe médicale  
 Suivi quotidien du plan diététique développé par l'équipe médicale  
 Suivi du plan d'entraînement adapté développé par l'équipe médicale  
 Si poids corporel considéré insuffisant, prise de poids de \_\_\_\_\_ kg par semaine / poids stable en l'espace de \_\_\_\_\_ semaines  
 Si poids corporel insuffisant, une prise de poids / graisse acceptable minimale de \_\_\_\_\_ kg/% doit être atteinte entre \_\_\_\_\_  
 Prise de poids régulière à intervalles de \_\_\_\_\_ semaines(s)  
 Après le \_\_\_\_\_ (jj/mm/aaaa), le poids et le % de graisse doivent être maintenus égal ou supérieur à un poids / masse de graisse acceptable de \_\_\_\_\_ (kg/%)  
 Autre \_\_\_\_\_

Si **TOUTES** les exigences sont remplies et que le comportement alimentaire (et autres conditions sévères) se sont normalisés, l'équipe médicale décidera de l'autorisation du retour à la compétition.

Moi, \_\_\_\_\_, j'ai lu le contrat et j'ai obtenu des réponses à toutes mes questions.

Nom de l'athlète \_\_\_\_\_

Signature de l'athlète \_\_\_\_\_

Date \_\_\_\_\_

Nom du médecin de l'équipe \_\_\_\_\_

Signature du médecin de l'équipe \_\_\_\_\_

Date \_\_\_\_\_

#### Références

Mountjoy M, Sundgot-Borgen J, Burke L, et al. IOC Consensus Statement. Beyond the Triad – RED-S in sport. Br J Sports Med. 2014; 48: 491-7.

#### Auteurs contributeurs

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<b>Naama Constantini (ISR)</b>	Orthopedic Department, Hadassah-Hebrew University Medical Center
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<b>Nanna Meyer (USA)</b>	University of Colorado, Health Sciences Department
<b>Roberta Sherman (USA)</b>	The Victory Program at McCallum Place
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<b>Richard Budgett (SUI)</b>	IOC Medical and Scientific Department
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#### Traduit en français par

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# RED-S CAT™

## Relativ energimangel i idrett (RED-S) Klinisk måleinstrument (CAT)

Benyttes av helsepersonell



Navn:

Dato:

Undersøker:

### Hva er RED-S CAT?

En ekspertgruppe oppnevnt av IOC Medical Commission har publisert et klinisk instrument som kan benyttes i forbindelse med undersøkelse og diagnostisering av idrettsutøvere ved mistanke om relativ energimangel, og som et hjelpemiddel i forbindelse med det å ta stilling til om en utøver som har vært til oppfølging/behandling for syndromet er klar for å gjenoppta trening og konkurranser.

På engelsk omtales dette instrumentet som RED-S CAT (Relative Energy Deficiency in Sport Clinical Assessment Tool). Forkortelsen RED-S CAT vil bli benyttet i den videre tekst. RED-S CAT kan anvendes av personer med helsefaglig kompetanse, for en klinisk vurdering av utøvere med symptomer på syndromet lav energitilgjengelighet. RED-S CAT instrumentet er basert på Den Internasjonale Olympiske Komites (IOC) consensus artikkel (RED-S, 2014<sup>1</sup>).

Dette instrumentet kan kopieres i sin nåværende form til bruk av idrettsorganisasjoner og idrettsmedisinske team. Endringer av instrumentet eller reproduksjon for publikasjonsformål krever tillatelse fra IOC.

**NB:** RED-S er en medisinsk diagnose. Diagnostisering foretas av helsepersonell. Beslutning knyttet til spørsmålet om når utøver med RED-S syndromet kan returnere til trening og konkurranser utføres i samråd med erfarte idrettsmedisinske team.

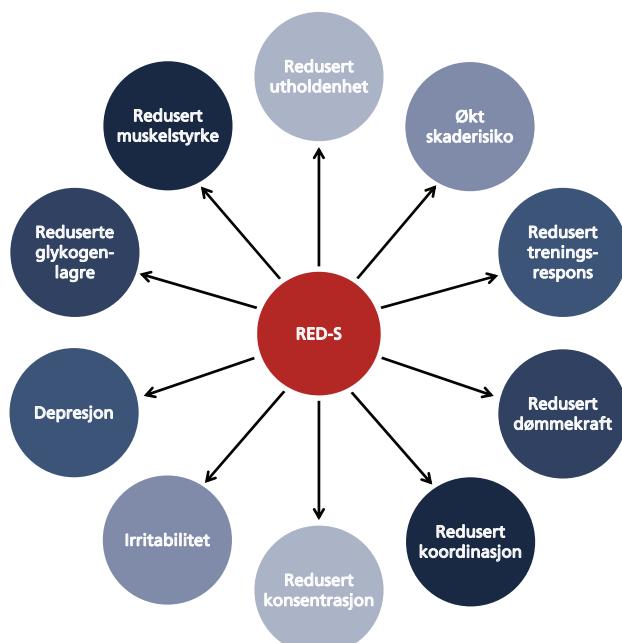
### Hva er relativ energimangel i idrett?

Syndromet RED-S refererer til nedsett fysiologisk funksjon forårsaket av relativ energimangel, og påvirker blant annet energiomsetningen, menstruasjonssyklusen, beinmineraltetthet, immunforsvaret, proteinsyntesen, og kardiovaskulær helse.

Årsaken til RED-S er lav energi tilgjengelighet, der et individ s totale energiinnntak via kosten ikke er tilstrekkelig til å dekke det resterende energi behov som kreves for helse, daglige gjøremål/hverdagsaktivitet, når energikostnadene ved trening også er tatt i betraktning.

Potensielle helsekonsekvenser knyttet til RED-S er presentert i figur 1. Når det gjelder psykologiske problemer kan det både være en årsak til og en konsekvens av RED-S.

Som det fremgår av figur 2 kan RED-S også påvirke ulike prestasjonsvariabler:

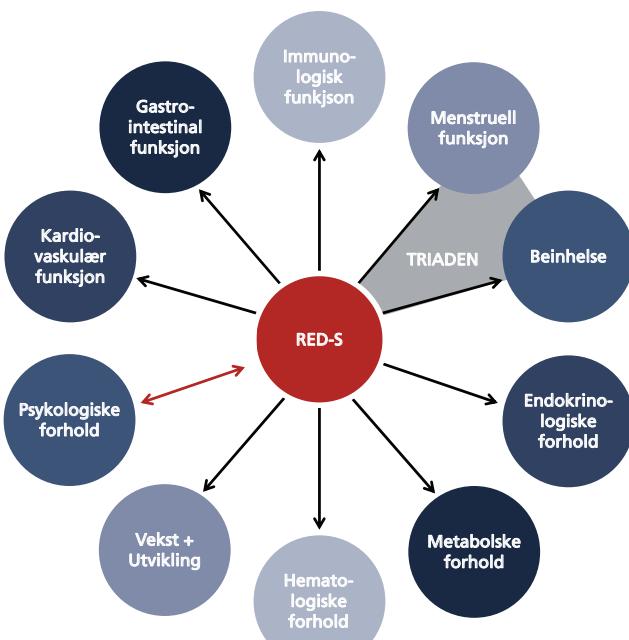


Figur 2

### Screening av RED-S

Screening og diagnostisering av RED-S kan være utfordrende i og med at symptomene kan være skjulte. RED-S kan forekomme i alle særidretter, men det er en overhøyhet i idretter hvor bedømming av prestasjon inkluderer vektlegging av estetikk eller utseende, idretter med vektkategorier, samt utholdenhetsidretter. Det bør være en spesiell fokus på de utøverne som er i risikosonen eller utøvere som representerer de kjente risikomiljøene (utholdenhetskrevende-, estetiske- og vektklasse idretter). Tidlig diagnostisering er viktig for å redusere risiko for langvarige helseplager og for å opprettholde og videreføre prestasjon.

Screening av RED-S kan foretas som en del av en årlig, helseundersøkelse og/eller når en idrettsutøver kommer til en konsultasjon og registreres med forstyrret spiseatferd (FS) / spiseforstyrrelse (SF), vekttap, mangel på normal vekst og utvikling, endokrin dysfunksjon, tilbakevendende skader og sykdom, nedsatt/variasjon i prestasjonsevne eller humørsvingninger.



Figur 1

## RED-S Modell for risikovurdering for deltagelse i idrett

Denne screeningundersøkelsen kan gjennomføres som en del av den ordinære helsesjekken som utøvere har. Avhengig av hvilke symptomer som registreres i forbindelse med undersøkelsen, kan utøveren via denne risikovurderingen klassifiseres i en av de tre følgende kategorier: «**Rødt lys**»: Høy risiko, «**Gult lys**»: Moderat risiko, «**Grønt lys**»: Lav risiko.

HØY RISIKO: START NEKT RØDT LYS	MODERAT RISIKO: VÆR OPPMERKSOM GULT LYS	LAV RISIKO: GRØNT LYS
<ul style="list-style-type: none"> <li>- Anorexia nervosa og andre alvorlige spiseforstyrrelser</li> <li>- Andre alvorlige medisinske (fysiologiske og psykologiske) tilstander relatert til lav energitilgjengelighet</li> <li>- Bruk av ekstreme vektregulerings teknikker som fører til dehydreringsindusert hemodynamisk ustabilitet, og andre livstruende tilstander</li> </ul>	<ul style="list-style-type: none"> <li>- Vedvarende unormal lav fett % målt med DXA* eller ved antropometri</li> <li>- Betydelig vekttap (5-10% av kroppsvekt på en måned)</li> <li>- Stagnasjon i forventet fysisk vekst og utvikling hos unge utøvere</li> </ul>	<ul style="list-style-type: none"> <li>- Tilfredsstillende fysikk som opprettholdes uten bruk av helsekadelig spise/treningsstrategier</li> </ul>
	<ul style="list-style-type: none"> <li>- Lav **energi tilgjengelighet av forlenget og/eller alvorlig natur</li> </ul>	<ul style="list-style-type: none"> <li>- Sunne spisevaner med optimal energi tilgjengelighet</li> </ul>
	<ul style="list-style-type: none"> <li>- Unormal menstruasjonssyklus: funksjonell hypotalamisk amenoré &gt;3 måneder</li> <li>- Ingen menarke ved 15-års alder hos jenter</li> </ul>	<ul style="list-style-type: none"> <li>- Friskt endokrint system</li> </ul>
	<ul style="list-style-type: none"> <li>- Redusertteinmineraltetthet (enten ved sammenligning med tidligere DXA eller Z-score &lt; -1 SD)</li> <li>- Historie med 1 eller flere brudd assosiert med hormonell/dysfunksjonell menstruasjon og/eller lav energitilgjengelighet</li> </ul>	<ul style="list-style-type: none"> <li>- Einmineraltetthet som forventet i forhold til type idrett, alder og etnisitet</li> <li>- Friskt muskel- og skjelettsystem</li> </ul>
<ul style="list-style-type: none"> <li>- Alvorlige EKG forandringer (f.eks. bradykardi)</li> </ul>	<ul style="list-style-type: none"> <li>- Utøvere med fysiske/psykiske komplikasjoner relatert til lav energitilgjengelighet +/- forstyrret spiseatferd</li> <li>- Tester som viser avvik som kan relateres til lav energitilgjengelighet +/- forstyrret spiseatferd</li> </ul>	
	<ul style="list-style-type: none"> <li>- Langvarig relativ energimangel</li> <li>- Forstyrret spiseatferd som påvirker andre med-utøvere</li> <li>- Mangel på prosesjon i behandling og/eller ikke etterfølgelse av behandling</li> </ul>	

\* Dual energy X-ray Absorptiometry

\*\*Energitilgjengelighet = Energintak – energiforbruk ved trening (et ytterligere energiforbruk ved gjennomføring av treningsøkt).

### MERKNAD knyttet til diagnostisk instrument for lav energitilgjengelighet:

Selv om lav energitilgjengelighet er en nøkkelfaktor i RED-S, er det på det næværende tidspunkt ingen standardisert protokoll for å måle energitilgjengelighet hos idrettsutøvere. Enkelte som jobber aktivt med idrettsernæring har utviklet egne verktøy for å overvåke energitilgjengelighet som de har tilstilt til, og benytter disse ved kartlegging av energitilgjengelighet eller ved kostholdsrådgivning. En universell anbefaling om hvordan en skal måle energitilgjengelighet er ikke gitt i og med at vi per i dag ikke har en protokoll/screeningverktøy som er sensitiv, pålitelig, tids-effektiv og kostnadseffektiv.

### Idrettsdeltakelse basert på risikokategori

**«Høy risiko – Rødt lys»:** ikke klarsignal for deltagelse i idrett.

På grunn av alvorlighetsgraden av hans / hennes kliniske tilstand kan deltagelse i idrett utgjøre en alvorlig fare for hans / hennes helse, og deltagelse vil også kunne ha en uheldig innvirkning på det fokuset som bør rettes mot behandling og restitusjon. **«Moderat risiko – Gult lys»:** klarering for trenings- og konkuransedeltagelse dersom utøveren veiledes tett og har en medisinsk behandlingsplan.

En risikovurdering av utøveren (re-evaluering) bør skje med jevne mellomrom på 1-3 måneder, avhengig av det kliniske bildet for å vurdere etterlevelse av behandlings/oppfølgingsplan samt å oppdage endringer i klinisk status.

**«Lav risiko – Grønt lys»:** full deltagelse på trening og i konkurranse.

## Behandling av relativ energimangel i idrett (RED-S)

Idrettsutøvere som kommer i kategorien «rødt lys» og «gule lys» bør få en medisinsk vurdering og behandling. Ideelt bør utøvere med RED-S behandles av et team bestående av en lege med spesialitet i idrettsmedisin, en fagperson med idrettsernæring som spesialitet, en treningsfisiolog, idrettsterapeut eller trener og idrettspsykolog/psykiater ved behov. Taushetsplikt må selvfølgelig opprettholdes. I behandlingen skal det være fokus på å korrigere den relative energimangelen gjennom å øke energinntaket og / eller redusere energiforbruket. Inntak av næringsstoffer og andre vitaminer bør følge de gjeldene retningslinjene for utøvere. Gjentagende vurdering av einmineraltetthet bør skje i intervaller på 6-12 måneder, avhengig av klinisk bilde og utgangsverdier. Det anbefales også å benytte en kontrakt i forbindelse med behandlingen (Se vedlegg).

## Relativ energimangel i idrett (RED-S); trinnvis risikovurdering i forhold til det å gjenoppta trening og konkurranse

Før det gis klarsignal for å gjenoppta trening og konkurranse etter en periode med behandling anbefales en ny helse undersøkelse hvor også idrettsspesifikke forhold knyttet til den gjeldene utøver blir tatt i betraktning:

TRINN	MODIFISERENDE RISIKOFAKTORENE	KRITERIER	RED-S SPESIFIKKE KRITERIER
Trinn 1 Evaluering av helsestatus	MEDISINSKE FAKTORER	<ul style="list-style-type: none"> <li>- Pasient demografi</li> <li>- Symptomer</li> <li>- Medisinsk historie</li> <li>- Tegn</li> <li>- Diagnostiske tester</li> <li>- Psykologisk helse</li> </ul>	<ul style="list-style-type: none"> <li>- Alder, kjønn</li> <li>- Se kolonne for «Gult lys» i RED-S risikovurderingsmodell</li> <li>- Gjentagende slanking, menstruasjons status, beinhelse</li> <li>- Vekttap/endringer, generell svekkelse</li> <li>- Hormoner, elektrolytter, EKG, DXA</li> <li>- Depresjon, angst, forstyrret spiseatferd/spiseforstyrrelser</li> <li>- Abnormal hormonell og metabolsk funksjon</li> <li>- Rytmeforstyrrelser i hjertet</li> <li>- Stress brudd</li> </ul>
TRINN 2 Evaluering av risiko ved deltagelse	MODIFISERENDE RISIKOFAKTORENE VED IDRETT	<ul style="list-style-type: none"> <li>- Type idrett</li> <li>- Spesifikke oppgaver i idretten/posisjon på laget</li> <li>- Konkurransenivå</li> </ul>	<ul style="list-style-type: none"> <li>- Vektsensitive idretter, fokus på kroppsform og tynnhet</li> <li>- Individuell vs. lagidrett</li> <li>- Elite vs. Mosjonist</li> </ul>
TRINN 3 Medvirkende forhold	MODIFISERENDE FORHOLD	<ul style="list-style-type: none"> <li>- Timing og sesong</li> <li>- Ytre press</li> <li>- Interessekonflikt</li> <li>- Frykt for søksmål</li> </ul>	<ul style="list-style-type: none"> <li>- Utenfor sesong, reise, miljømessige faktorer</li> <li>- Mentalt «klar» for å konkurrere</li> <li>- Trener, eier av lag, utøverens familie, sponsorstøtte</li> </ul>

## Reklassifisering av utøveren etter en trinnvis risikovurdering

I etterkant av en periode med oppfølging/behandling vil en trinnvis risikovurdering av den gjeldene utøver i forhold til det å gjenoppta trening og konkurranse igjen kunne klassifisere/re-klassifisere utøveren til «Høy risiko – rødt lys», «Moderat risiko – gult lys» eller «Lav risiko – grønt lys» kategoriene. RED-S modell for risikovurdering er tilpasset for å hjelpe klinikere til å ta en avgjørelse når det gjelder spørsmålet om utøveren er klar for å gjenoppta trening og konkurranser.

RED-S modell for gjenopptagelse av trening og konkurranse viser hvilken aktivitet som er anbefalt for hver risiko kategori.

HØY RISIKO RØDT LYS	MODERAT RISIKO GULT LYS	LAV RISIKO GRØNT LYS
<ul style="list-style-type: none"> <li>- Ingen konkurranser</li> <li>- Ingen trening</li> <li>- Bruk av skriftlig kontrakt</li> </ul>	<ul style="list-style-type: none"> <li>- Kan trenere så lenge han/hun følger behandlingsplanen</li> <li>- Kan konkurrere så lenge han/hun følger behandlingsplanen</li> </ul>	<ul style="list-style-type: none"> <li>- Kan delta på alt</li> </ul>

# VEDLEGG

## Behandlings kontrakt for Relativ energimangel i idrett (RED-S)

RED-S Behandlings kontrakt for \_\_\_\_\_

### Tverrfaglig Team:

- (Lege) \_\_\_\_\_  
 (Psykolog/Psykiater) \_\_\_\_\_  
 (Treningsfysiolog) \_\_\_\_\_  
 (Ernæringsfysiolog) \_\_\_\_\_  
 (Andre) \_\_\_\_\_

### Krav:

- Møte med psykater med intervaller anbefalt av behandlingsteamet  
 Møte med ernæringsfysiolog med intervaller anbefalt av behandlingsteamet  
 Møte med lege med intervaller anbefalt av behandlingsteamet  
 Følge daglig mat plan utviklet av behandlingsteamet  
 Følge den tilpassede treningsplanen utviklet av behandlingsteamet  
 Dersom undervektig, forventet vektøkning på \_\_\_\_\_ kg per uke/vektstabil innen \_\_\_\_\_ uker  
 Dersom undervektig, et krav på oppnåelse av minimum akseptabel kroppsvekt/ fettprosent på \_\_\_\_\_ kg/% innen \_\_\_\_\_  
 Regelmessig innveiing med følgende tidsintervall på \_\_\_\_\_ uke (er)  
 Etter denne datoен, \_\_\_\_\_ (dag/måned/år), må vekt og fett % opprettholdes på eller over minimum akseptert kroppsvekt/fett masse på \_\_\_\_\_ (kg/%)  
 Annet \_\_\_\_\_

Dersom **ALLE** kravene oppfylles samtidig med at spiseatferden (og andre alvorlige tilstander) er normalisert, vil team-legen ta en avgjørelse vedrørende klarering for konkuransedeltakelse.

Jeg, \_\_\_\_\_, har lest denne kontrakten og alle mine spørsmål ble besvart.

Utøvers navn \_\_\_\_\_

Utøvers signatur \_\_\_\_\_

Dato \_\_\_\_\_

Navn på team lege \_\_\_\_\_

Signatur team lege \_\_\_\_\_

Dato \_\_\_\_\_

### Referanser

Mountjoy M, Sundgot-Borgen J, Burke L, et al. IOC Consensus Statement. Beyond the Triad – RED-S in sport. Br J Sports Med. 2014; 48: 491-7.

### Medvirkende forfattere

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### Til norsk og oversatt av

Jorunn Sundgot-Borgen (NOR) Department of Sports Medicine, The Norwegian School of Sport Sciences

# RED-S CAT™

## Strumento di accertamento clinico del deficit energetico relativo nello sport (RED-S CAT)

Riservato a solo uso di medici professionisti



Nome:

Data:

Esaminatore:

### Cos'è il RED-S CAT?

Il RED-S CAT (Relative Energy Deficiency in Sport Clinical Assessment Tool) è uno strumento di accertamento clinico per la valutazione di atleti/individui attivi sospettati di avere una carenza energetica relativa e per indirizzare le decisioni sul ritorno all'attività. Il RED-S CAT è creato in modo che un professionista medico possa utilizzarlo durante l'accertamento clinico e la gestione di atleti con questa sindrome. Il RED-S CAT è basato sul Consensus Statement sul RED-S del Comitato Olimpico Internazionale, 2014.<sup>1</sup>

Questo strumento può essere copiato liberamente nella sua forma attuale per l'uso da parte di organizzazioni sportive e team medici. Modifiche dello strumento o riproduzioni a scopo di pubblicazione esigono il permesso del Comitato Olimpico Internazionale.

**NOTA:** La diagnosi del RED-S è una diagnosi medica che deve essere eseguita da un professionista sanitario esperto. La gestione clinica ed il ritorno all'attività di atleti con RED-S dovrebbe avvenire sotto la guida di un team medico sportivo competente.

### Cos'è il deficit energetico relativo nello sport?

*La sindrome del RED-S riferisce ad un compromesso funzionamento fisiologico a causa di una carenza di energia relativa, ed include, ma non è limitato, all'indebolimento di metabolismo basale, funzionalità mestruale, salute delle ossa, immunità, sintesi proteica e salute cardiovascolare.*

La causa del RED-S è uno scenario definito «bassa disponibilità energetica», dove l'apporto energetico individuale è insufficiente a sostenere il fabbisogno energetico necessario per la salute, il funzionamento e la vita quotidiana, una volta che è stato considerato il dispendio energetico per le attività fisiche e sportive.

Le possibili conseguenze sanitarie del RED-S sono illustrate nel relativo modello concettuale (Figura 1). Problemi psicologici possono essere sia risultato che causa del RED-S.

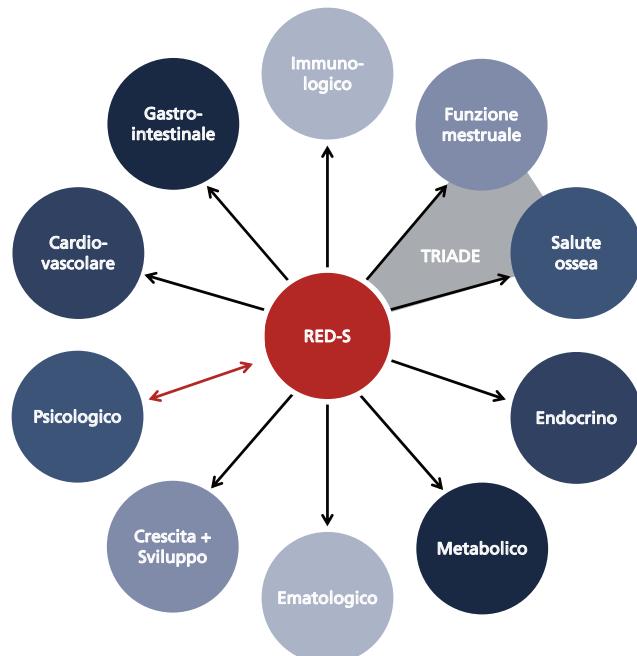


Figura 1

Il RED-S può anche influenzare la prestazione sportiva dell'atleta. Le possibili conseguenze del RED-S sulla prestazione sono illustrate nella Figura 2:

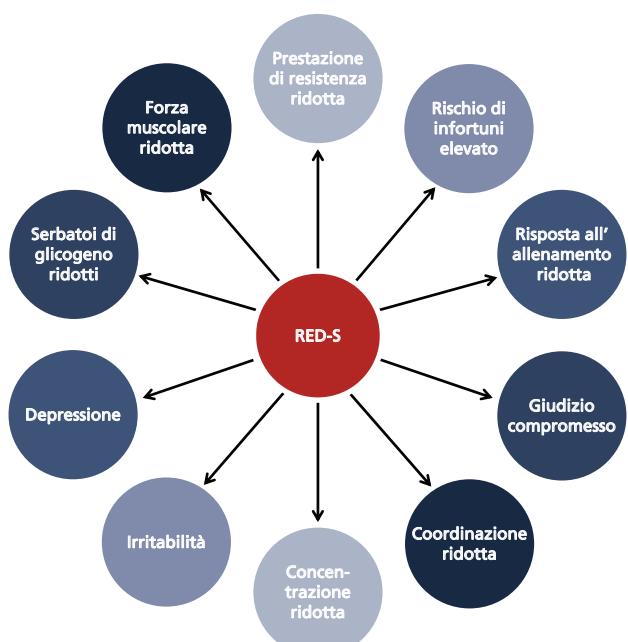


Figura 2

### Screening del RED-S

Screening e diagnosi del RED-S risultano impegnativi, perché la sintomatologia può presentarsi in maniera poco accentuata. Un'attenzione particolare all'atleta a rischio è necessaria. Sebbene qualsiasi atleta può incorrere nel RED-S, sono particolarmente a rischio quelli che praticano sport in cui si pone un'enfasi sull'estetica o l'aspetto, sport con categorie di peso, e sport di resistenza. Una diagnosi precoce è fondamentale per mantenere e migliorare le prestazioni ed evitare conseguenze a lungo termine sulla salute.

Lo screening per il RED-S può essere intrapreso come parte di un esame medico periodico annuale e quando un atleta si presenta con alimentazione disturbata / disturbi del comportamento alimentare, perdita di peso, mancanza di normali crescita e sviluppo, disfunzioni endocrine, infortuni e malattie ricorrenti, diminuzione / variabilità della prestazione o cambiamenti di umore.

## Modello dell'accertamento del rischio RED-S per partecipazione allo sport

Questo modello può essere incorporato nell'esame medico periodico. A seconda dei risultati su storia ed esame fisico, l'atleta è classificato in una delle seguenti 3 categorie: **«Luce Rossa»: Rischio elevato**, **«Luce Gialla»: Rischio moderato**, **«Luce Verde»: Rischio basso**.

RISCHIO ELEVATO: NIENTE PARTENZA LUCE ROSSA	RISCHIO MODERATO: CAUTELA LUCE GIALLA	RISCHIO BASSO: LUCE VERDE
- Anorexia nervosa e altri disturbi seri del comportamento alimentare - Altre gravi condizioni mediche (psicologiche o fisiologiche) collegate a bassa disponibilità energetica - Uso di tecniche di perdita di peso estreme che portano ad instabilità emodinamica indotta da disidratazione ed altre condizioni di pericolo di vita	- Anormalmente bassa % di massa grassa (misurata con DXA* o antropometria) per un tempo prolungato - Perdita di peso sostanziale (5-10 % massa corporea in un mese) - Attenuazione di crescita e sviluppo attesi nell'atleta adolescente	- Fisico appropriato che viene gestito senza eccessivo stress o malsane abitudini alimentari/ strategie di esercizio
	- Bassa **DE prolungata e/o di natura seria	- Sane abitudini alimentari con un'adeguata DE
	- Ciclo mestruale anomalo: amenorrea ipotalamica funzionale >3 mesi - Mancanza di menarca all'età di 15 anni nelle femmine	- Sistema endocrino sano e funzionante
	- Massa minerale ossea ridotta (sia comparando con DXA antecedenti o Z-score <-1 DS) - Storia di una o più fratture da stress associate a disfunzione ormonale / mestruale e/o bassa DE	- Massa minerale ossea sana come prevista per sport, età ed etnicità - Sistema muscolo-scheletrico sano
- Anormalità severe dell'ECG (cioè bradicardia)	- Atleti con complicazioni fisiche/psicologiche collegate a bassa DE +/- alimentazione disturbata - Anomalie di test diagnostici collegate a bassa DE +/- alimentazione disturbata	
	- Deficit relativo dell'energia prolungato - Alimentazione disturbata con impatto negativo sugli altri membri della squadra - Mancanza di progresso del trattamento e/o di compliance	

\* Dual Energy X-ray Absorptiometry (assorbimetria a raggi X a doppia energia)

\*\*DE: Disponibilità energetica = Apporto energetico – dispendio energetico per esercizi fisici e sportivi (surplus d'energia spesa per l'esercizio).

### NOTA su strumenti diagnostici per bassa DE:

Anche se la bassa DE è un fattore chiave nel RED-S, per ora non vi è alcun protocollo standardizzato per valutare la DE negli atleti non strettamente e costantemente monitorati. Alcuni esperti di nutrizione sportiva possono aver sviluppato degli strumenti per monitorare la DE in cui hanno fiducia, e possono usare questi per lo screening dei problemi o per indirizzare la consulenza dietetica. Tuttavia, in mancanza di un protocollo sensibile, affidabile, efficiente per durata e costi una raccomandazione universale per misurare la DE non è applicabile.

## Partecipazione allo sport basata sulle categorie di rischio

**«Rischio elevato – Luce Rossa»: Niente permesso per partecipazione allo sport.**

A causa della gravità della sua presentazione clinica, la partecipazione allo sport può costituire un serio pericolo alla sua salute e può anche distrarre l'atleta dal dedicare l'attenzione necessaria per trattamento e recupero.

**«Rischio moderato – Luce Gialla»: Permessa la partecipazione allo sport solo sotto supervisione e con trattamento medico pianificato.**

La rivalutazione dell'accertamento del rischio per l'atleta dovrebbe avvenire ad intervalli regolari di 1-3 mesi secondo lo scenario clinico per valutare la compliance e per rilevare cambiamenti dello stato clinico.

**«Rischio basso – Luce Verde»: Partecipazione a pieno allo sport.**

## Trattamento del deficit energetico relativo nello sport (RED-S)

Gli atleti classificati nelle zone di luce rossa e luce gialla dovrebbero ricevere valutazione e trattamento medico. Il trattamento del RED-S dovrebbe essere effettuato da un team di professionisti sanitari, tra cui e a seconda delle necessità un medico dello sport, dietista sportivo, fisiologo dello sport, terapeuta atletico o allenatore, psicologo/psichiatra sportivo. La riservatezza del paziente deve essere mantenuta. Il trattamento dovrebbe concentrarsi sulla correzione del deficit energetico relativo tramite aumento dell'apporto energetico e/o riduzione del dispendio di energia. L'assunzione di vitamine e di altre sostanze nutritive dovrebbe avvenire secondo linee direttive stabilite. L'analisi della massa minerale ossea dovrebbe avvenire ad intervalli di 6-12 mesi, a seconda della presentazione clinica e dei valori iniziali.

Si consiglia inoltre l'utilizzo di un contratto con l'atleta. (Vedi Appendice).

## Step del processo decisionale per l'accertamento del rischio del deficit energetico relativo nello sport (RED-S) per determinare la condizione al ritorno all'attività

Prima di concedere ad un atleta il permesso di riprendere sport/attività fisica in seguito a trattamento RED-S, un accertamento della salute dell'atleta e delle esigenze del suo sport dovrebbero essere effettuate secondo l'approccio graduale:

STEPS	MODIFICATORI DEL RISCHIO	CRITERI	CRITERI SPECIFICI DEL RED-S
STEP 1 Valutazione dello stato di salute	FATTORI MEDICI	- Dati demografici del paziente - Sintomi - Storia clinica - Segni - Test diagnostici - Salute psicologica - Potenziale gravità	- Età, sesso - Vedi colonna «Luce Gialla» del modello dell'accertamento del rischio - Diete ricorrenti, salute mestruale, salute ossea - Perdita/fluttuazioni di peso, debolezza - Ormoni, elettroliti, elettrocardiogramma, DXA - Depressione, ansia, alimentazione disturbata / disturbi del comportamento alimentare - Funzione ormonale & metabolica anomale - Aritmia cardiaca - Fratture da stress
STEP 2 Valutazione del rischio di partecipazione	MODIFICATORI DEL RISCHIO DELLO SPORT	- Tipo di sport - Ruolo - Livello di competizione	- Sport sensibili al peso/ magrezza - Sport individuale vs sport di squadra - Sport d'élite vs ricreativo
STEP 3 Modificazione della decisione	MODIFICATORI DELLA DECISIONE	- Tempismo & stagione - Pressione dell'atleta - Pressione esterna - Conflitti d'interesse - Paura di vertenze	- In/fuori stagione, viaggio, fattori ambientali - Condizione mentale per competere - Allenatore, proprietario della squadra, famiglia dell'atleta, sostegno degli sponsor - Se limitato dalla concorrenza

## Modello per il ritorno all'attività

A seguito della rivalutazione clinica utilizzando la valutazione a 3 passi descritta sopra, gli atleti possono essere riclassificati nelle categorie **«Rischio elevato – Luce Rossa»**, **«Rischio moderato – Luce Gialla»** o **«Rischio basso – Luce Verde»**. Il Modello dell'accertamento del rischio del RED-S è stato adattato per aiutare la decisione dei medici a determinare la condizione di un atleta per ritornare a praticare lo sport/attività fisica.

Il **modello per il ritorno all'attività** del RED-S delinea l'attività sportiva raccomandata per ciascuna categoria di rischio

RISCHIO ELEVATO LUCE ROSSA	RISCHIO MODERATO LUCE GIALLA	RISCHIO BASSO LUCE VERDE
- Niente competizione - Niente allenamento - Uso di contratto scritto	- Si può allenare purché seguendo il piano di trattamenti - Può competere sotto la supervisione di un medico	- Partecipazione allo sport completa

## APPENDICE

### Contratto per il trattamento del deficit energetico relativo nello sport (RED-S)

Contratto per il trattamento RED-S per \_\_\_\_\_

#### Team multidisciplinare:

- (Medico) \_\_\_\_\_  
 (Psicoterapista/Psichiatra) \_\_\_\_\_  
 (Fisiologo dello sport) \_\_\_\_\_  
 (Dietista) \_\_\_\_\_  
 (Altri) \_\_\_\_\_

#### Requisiti

- Incontro con psicoterapista ad intervalli raccomandati dal team di professionisti della salute che eseguono il trattamento  
 Incontro con dietista ad intervalli raccomandati dal team di professionisti della salute che eseguono il trattamento  
 Incontro con medico ad intervalli raccomandati dal team di professionisti della salute che eseguono il trattamento  
 Seguire la pianificazione giornaliera dei pasti raccomandata dal team di professionisti della salute che eseguono il trattamento  
 Seguire la pianificazione adattata dell'allenamento raccomandata dal team di professionisti della salute che eseguono il trattamento  
 Se sottopeso, l'aumento di peso previsto è di \_\_\_\_\_ kg alla settimana/avere peso stabile entro \_\_\_\_\_ settimane  
 Se sottopeso, bisogna arrivare ad un minimo accettabile di peso / massa grassa di \_\_\_\_\_ kg/% entro \_\_\_\_\_  
 Pesate regolari ai seguenti intervalli di \_\_\_\_\_ settimane  
 Dopo questa data, \_\_\_\_\_ (gg/mm/aaaa), deve mantenere peso e % massa grassa al/al di sopra del minimo accettabile di \_\_\_\_\_ (kg/%)  
 Altro \_\_\_\_\_

Se **TUTTE** le esigenze sono soddisfatte ed il comportamento alimentare (ed altri condizioni serie) sono normalizzate, il medico del team deciderà di accordare il permesso a riprendere le attività.

Io, \_\_\_\_\_

ho letto questo contratto e ricevuto risposta a tutte le mie domande.

Nome atleta \_\_\_\_\_

Firma atleta \_\_\_\_\_ Data \_\_\_\_\_

Nome medico del team \_\_\_\_\_

Firma medico del team \_\_\_\_\_ Data \_\_\_\_\_

#### Riferimenti bibliografici

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