Bulletin de medicine du sports

Bulletin of Sports Medicine

Volume 23 , May 2018

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UAMS Bulletin
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Dear African countries,

I would like to express my deepest gratitude and appreciation to all the board members of the African Union of Sports Medicine (UAMS) to allow me to write in the 23th edition of the UAMS magazine.

The field of Sports medicine in Egypt is developing by implementing new methods and through the cooperation with the African countries towards achieving sport of high performance under the umbrella of the African Union of Sports Medicine (UAMS) and the World Anti-Doping Agency (WADA). Moresover, Egypt is now taking all the necessary procedures to accredit the International Egyptian Anti-Doping Laboratory.

The UAMS Magazine has a great role in emphasizing the importance of sports medicine awareness among African athletes, coaches and trainers in order to improve sports performance in African Countries.

Finally, I wish all the best and great achievements for all the African countries in the field of sport medicine.

Eng. Khaled Abdel Aziz

Minister of Youth and Sport

welcome

Twenty two years have passed since the UAMS Bulletin was launched. We brought it into being with the aim to create a Sports Medicine Bulletin that comes from Africa, a high quality medium which was designed to represent Africa as a continent of first rate medicine and provide an adequate frame for international publications from specialists in the field of Sports Medicine.

Finally, I wish you an interesting and fruitful reading to this valuable edition.

Dr. Sayed.H.Khashaba

UAMS General Secretary

President of the Egyptian Association Of Sports Medicine

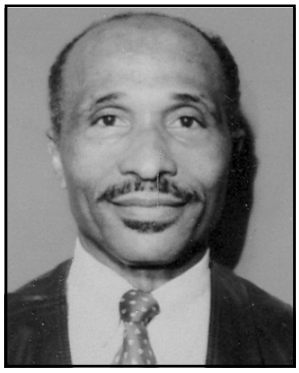
Member of International Fedration of Sports Medicine (FIMS)

Medical Advisor of Special Olymbics Committee (MAC) Washington DC

Sport medicine and new challenges

Dr. Kahled Masoud

Sport medicine is encountering new challenges in the way of manufacturing Olympic champion ; on top of which is the right way to face doping and knowing their direct effect on implanting negative thoughts like false gaining , in addition to this how dose doping adversely affect sportsmen's health and the safety of the physiological organs and C.N.S. . On the other hand; came the matter of champion formation, as from the point of sport medicine, comes the psychological side, specifically psychological rehabilitation after injury and the stages that affect sportsman starting from chock just after injury till reaching the fact that the player is now confirmed by his injury and he got the right psychological program and trainer for rehabilitation. Third axis is the choice, which includes four sides physical, physiological, morphological, and psychological; hence, came the role of sportsmen sector, as it should be like special selection machine in all fields of sport, and this is what we are going to discuss in the coming articles, GOD welling.



PRESIDENTIAL EDITORIAL

Prof. Constant Antoine ROUX - Côte d'Ivoire
President of African Union of Sports Medicine

A vous tous Membres du Comité Exécutif et Membres Individuels de l' UAMS

J'espère que vous avez passé d'excellentes fêtes de fin d'année ; RAMADAN ; NOËL Familial et St Sylvestre le 31 décembre 2017.; alors veuillez accepter :VOUS TOUS et TOUX CEUX QUI VOUS SONT CHERS , mes meilleurs voeux de Bonne HEUREUSE NOUVELLE ANNÉE 2018;SANTÉ , PROSPÉRITÉ, et PAIX .Puisse l'Amitié , l'Amour et la PAIX (Loin des ''attentats '',des perturbations climatiques dévastatrices ..) prévaloir entre les Gens ,les Nations , d'Afrique -certes - , mais aussi du Monde Entier ...

--J'ai personnellement participé -- comme invité -- au congrès Commun de la SFMES/SFTS à Marseille au 21 au 23 septembre 2017 ,ou nous avons pris part à la réunion du Conseil d'Administration de l'UVFMS avec nos amis les Professeurs Michel RIEU , ,Xavier Bigard , Pierre Pesquies ,Pierre Berteau (--ancien Président de la SFMS -qui décédera les 30 november à Rouen; un brillant cardiologue en médecine du sport), François Delmotte; lors de l'Assemblé générale de la SFMES un émouvant hommage a été décerné à la mémoire de notre ami -- aussi ancien Président de la SFMS --le regretté Professeur Pierre Rochcongar -

Avec notre ami Sayed Hussein KASHABA , j'ai participé à la réunion du Comité Exécutif de la FIMS le vendredi 17 novembre 2017 à l'Estoril Lisbonne (Portugal) .--Il est fortement recommandé que les Associations nationales de Médecine du Sport en Afrique s'acquittent de leur droit de cotisation annuelle à la FIMS--La prochaine réunion du Co-

mité Exécutif de la FIMS aura lieu à Macao le 07 avril 2018. et le 35 ème Congrès Mondial de la FIMS se tiendra au Brésil :à Rio de Janeiro du 12 au 15 septembre 2018. Nous invitons vivement toutes Associations nationales et les Membres Africains de l'UAMS à y prendre part .

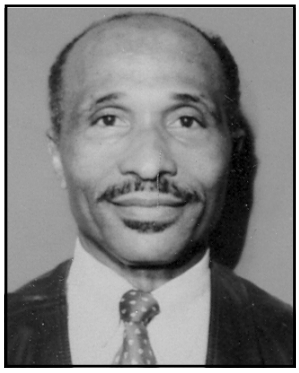
-Dear Friends . Chers Amis

To ALL of YOU : UAMS EXECUTIVE Board MEMBERS and INDIVIDUALS MEMBERS ,I hope THAT that you have enjoyed excellent deasts of end of year : RAMADAN, Familial CHRISTMAS , St Nicklaus ans St Sylveter , on 31st December 2017 Can you accepte to yourselves and to all your favorites relatives :My BEST WISHES of a GOOD HAPPY NEW YEAR 2018 : HEALTH , PROSPERITY ans PEACE --May FRIENDSHIP ,LOVE and PEACE (so far Outrages , so devastation climatic perturbations...) predispose between people , Nations , yes indeed: In Africa , but also in the Whole World .As a Guest , I have personnally attended to common SFMES/SFTS Sports Medicine Congress from 21st to 23rd september 2017 in Marseilles (France) , where We have also attended Administratiion Counsel UVFMS with ours friends Professors Michel RIEU , Xavier BIGARD , Pierres PESQUIES , Pierre BERTEAU (Former FIMS Past President , who be dead on 30 november 17 at Rouen ; a so famous cardiologist in sports medicine)Francois DELMOTTE . During General Assembly SFMES; a pathetic homage was done to our regretted Friend Pierre ROCGHCONGAR's memory , former FIMS Past President , too .

---With our friend Sayed Hussein KASHABA I took part on 17 th september 17 to FIMS Executive Board meeting at ESTORIL LISBON (Portugal)-We fermelly recomand the Africa Spotrs Medicine Associations pay their annual FIMS fee.

--Next FIMS Executive meeting must be held in Macao on 07 April 18 , and the 35th World Congress of Sports Medicine FIMS will be from 12 to 15th September 2018 in Rio de Janeiro (Brazil).- We invite --of course --the All Sports medicine Africa Associations and all UAMS members to attend that FIMS World Congress .

Friendly yours -



LES PROBLEMES DE LA ROTULE "PATELLA PROBLEMS"

Prof. Constant Antoine ROUX - Côte d'Ivoire
President of African Union of Sports Medicine

1- INTRODUCTION :

I-La Pathologie Fémoro-patellaire forme un tout : qu'il s'agisse de luxation récidivante , de subluxation rotulienne , d'instabilité, de chondromalacie -

-Le terme évolutif est le même : l'arthrose fémoro-patellaire .-

-la cause est unique : c'est la malposition , le ''dysfonctionnement ''de l'appareil extenseur .-

II - La BIOMECANIQUE de la rotule offre deux particularités : -la sollicitation externe de la rotule -la contrainte en compression sur le fémur .

a) la sollicitation externe de la rotule : -l tendon quadricipital et tendon rotulien ne sont pas alignés , mais ils forment un angle ouvert en dehors dont la rotule est le sommet : c'est l'angle Q.

-La contraction du quadricipital tend à aligner le système , donc sollicite la rotule en dehors : elle restera en place normalement , grâce à l'association de facteurs osseux , ligamentairs et articulaires .

b) Les contraintes fémoro-patellaires en compression .-La contraction du quadriceps tend à écraser la rotule sur le fémur .Cette contrainte représente 250 kgs , soit environ 3 fois le poids du corps . --Normalement ces contraintes sont supportées parcequ'elles distribuent sur toute la surface de l'articulation fémoro-patellaire --Mais en cas de malposition rotulienne , les surfaces au contact sont rétrécies , donc la pression unitaire au cm2 augmente :l'évolution se fera vers l'arthrose .

III- ANATOMIE :Moyens de contention de la rotule .

1) -Osseux . -Vallée trochléenne : doit être creuse et former un angle ouvert an avant de 140° -la crête externe doit être plus saillante que l'interne de 5 mm en moyenne .--La rotule , qui s'engage (lors de la flexion du genou) dans la vallée trochléenne comme un filin dans une poulie , sur une course de 8 cm au total , doit avoir une crête bien dessinée , séparant 2 joues dont la symétrie est variable (WIBERG)

2)-LIGAMENTO-CAPSULAIRES ce

sont les ailmerons rotuliens , qui maintiennent latéralement la rotule , tendu de ses bords latéraux aux condyles fémoraux .

3) - les MUSCLES , et surtout le Vaste Interne , véritable ''gardien de la rotule ''- Ses fibres les plus basses , presque horizontales , s'opposent à la sollicitation externe de la rotule .-C'est pourquoi ele s'insèrent sur le bord interne (alors que le vaste externe ne s'insère pas sur le bord externe).- Le bord inférieur du vaste interne doit se situer à 1 ou 2 cm au-dessous du bord supérieur de la rotule .

IV - les causes et conditions de l'instabilité .

1- OSSEUSES

a) - Fémorales : trochlée plate , sans berge externeb)

b)- rotuliennes :

-rotule dysplasique:

- petite , sans crête médiane , sans facette externe

- anomalie de hauteur : Patella alta.

La rotule est instable avant de s'engager dans la poulie trochléenne .

c)-tibiales:

- insertion trop externe du tendon rotulien sur le tibia.

-hyper rotation externe du tibia qui tend ''fonctionnellement'' à reporter en dehors la tubérosité tibiale antérieure , donc à augmenter l'angle A , donc la sollicitation externe de la rotule .Cette hyper-rotation externe peut-être =-congénitale --ou acquise par laxité chronique antéro-interne du genou (lésion traumatique du point d'angle postéro-interne et du L.C.A.

d) -Désaxation frontale du membre inférieur avec genu-valgum , augmentant ainsi l'angle Q .

2-Musculaires :

a)- Vaste externe :

-Brièveté congénitale ou acquise.

-Pas d'insertion basse latéro-rotulienne.

b)- Dysfonctionnement et asynchronisme avec retard à la contraction du vaste interne

3- AILERONS ROTULIENS .

a)-Externe :court ; épais , rétracté : -Syndrome d'hypertension externe (S.H.T.E.)

b) - Interne : -Lâche et déhiscent ; mais à cause ou conséquence du déséquilibre ?

Au TOTAL : -Conditions et causes d'instabilités multiples .: -formant un ensemble d'anomalies différemment associées selon les cas .

-d'où un examen clinique et radiologique minutieux .,

-et un traitement qui devra être adapté.

V - CLINIQUE ET TRAITEMENT .

3 Grands Groupes :

1-La Luxation Traumatique .

2- Les Subluxations ou instabilités

3- Les chondromalacies .

1- La luxation traumatique : toujours EXTERNE !!!

-Mérite à peine d'être isolée , car c'est le plus souvent le symptôme révélateur et inaugural (réception d'un saut , mouvement

de V.F.E.) -Très rarement luxation traumatique vraie par un choc purement tangentiel .-L'aileron rotulien interne est déchiré ou arraché avec un fragment osseux rotulien essentiel pour un diagnostic rétrospectif .-Réduction par le blessé lui-même , mais nécessite parfois une anesthésie générale .

-TRAITEMENT :

1-ORTHOPEDIQUE par genouillère plâtrée 1 mois , mais récidive fréquente. .

2-Chirurgical :-Soit simple suture de l'aileron interne , mais peu logique car insuffisant .

Plutôt choisir le traitement complet soit d'emblée , soit plutôt à froid .

2- Les SUBLUXATIONE EXTERNES --Les INSTABILTES ROTULIENNES .

-Groupe le plus fréquent , le plus important -Il est facile d etout regropuer et de d"=écrire un syndrome rotulien . a)- clinique : -Souvent alternance de :-accidents aigus :luxation ou instabilité sur des mouvements de V.F.E. 6sUR UNFOND PLUS OU MOINS PERMANENT DOULEURS DANS LES ESCALIERS ? EN POSITION ASSISE PROLOGEE .

b) -Examen clinique : -Diagnostic positif --Rotule Luxable -Signe de SMILLIE (douleur provoquée lors de la sollicitation externe de la rotule par pression sur le bord interne , à divers degrés degrés de flexion du genou) --Signe de lésions chondrales de la face postérieure de la rotule , notamment douleur à la percussion de la rotule , à l'ascension contrariée de la rotule :signe du ''rabot ''-- Recherche étiologique : -Baïonnette de l'appareil en extenseur , avec position externe de la tubérosité tibiale .--Patella alta -Amyotrophie du vaste interne _Genu Valgum - Hyper - rotation externe du tibia (normale 45°)--Instabilité du genou par laxité antéro-interne .

c) - Signes radiologiques :montrant la malposition rotulienne --Latéralement : - sur les incidences axiales à 30° , 60°,90° examen indispensable qui dit impérativement faire partie systématiquement du bilan radio du genou .--Met en évidence , la subluxation externe de la rotule . et sa malformation éventuelle (aspect en béret basque , par aplasie de la facette articulaire interne. --Peuvent être faite avec et sans contraction .-

du quadriceps ..

--EN HAUTEUR ; rechercher une patella alta difficile à mesurer

-. Repères a) _d'INSALL(hauteur du tendon rotulien par rapport à la hauteur de la rotule) b) de CATON(distance pointe de la rotule -angle supéro-antérieur du tibia , par rapport à la hauteur de la rotule) c) de BLUMENSAAT (projection de la pointe de la rotule pae rapport à la ligne intertrochléo-condylienne , sur un genou de profil à 30 ° de flexion montrant la baïonnette de l'appareil extenseur d) mesure de la distance séparant les projections de la gorge trochléenne (GT) et

de la tubérosité tibiale antérieure (TA) qui théoriquement ne doit pas dépasser 15 mm.

-En FAIT : Ces signes radiologiques sont très insuffisants et une étude radiographique normale ne peut jamais faire rejeter le diagnostic car ils ne tiennent pas compte de 2 éléments fondamentaux : 1- On sait que la zone d'instabilité rotulienne se situe entre 0 et 30° , c'est à dire une zone inexplorable par les moyens radios habituels pour des raisons techniques . Actuellement il existe l'IRM .-Le Scanner ou tomo-densitométre comble cette énorme lacune et apporte des renseignements fondamentaux montrant la malposition rotulienne dès les tous premiers degrés de flexion avant que la rotulene s'engage franchementdans la poulie trochléenne. 2- Toutes ces études sont statiques et font la part trop belle aux facteurs purement osseux et négligent totalement l'aspect dynamique (facteurs musculaires et ligamentaires), probablement le plus important .

-DIAGNOSTIC ; - ESSENTIELLEMENT FAIT par l'interrogatoire du patient .--Se rappeler la très grande augmentation de fréquence chez la jeune fille de 16 ans .environ , age auquel se démasque l'instabilité parfois par une luxation vraie .- Seul diagnostic différentiel:la lésion méniscale +++ .Se rappeler sa raeté statistique chez l'adolescente

-Méfiance :trop de méniscectomies ont été faites inutilement à cet age.--MAIS association possible de l'arthrographie ,du schuss, de l'IRM .

-LE TRAITEMENT :

1) -Interventions périmées

- ROUX .Transposition isolée de la tubérosité tibiale

- KROGIUS :-LECENE : Plastie du Vaste interne .

- FEVRE -DUPUIS : Combinaison des 2 précédentes .

-RELEVEMENT de la joue externe de la trochlée

2) Actuellement : Intervention d'ELMSLIE , qui comprend :-la transposition interne de la tubérosité tibiale._ La section de l'aileron rotulien externe --Le raccourcissement de l'aileron interne ..Selon les cas on ajoutera à la demande : - la régularisation du cartilage malacique .- l'abaissement de la tuberosité si ''Patela alta '' --La plastie d'allongement du vaste externe --L'abaissemet de l''insertion latérorotuliene du vaste interne .

-Le transfert des muscles de la patte d'oie . selon la technique de SLOCUM, s'il existe une composante de laxité antéro-interne ..

3)- le plus souvent ce traitement chirurgical sera précedé d'un traitement kinésitherapique visant à muscler le quadriceps en isométrique et utilisant la rééducation de la proprioceptivité sur planche instable , par exemple.Il permet das un certain nombre de cas diversement appreciésuivant les uteurs d'éviter l'intervention chi-

rurgicale .- Résultats du traitement chirurgical .: Très bons dans l'immédiat car il supprime les accidents aigus (luxation ou instabilité) , MAIS ne préviet pas toujours la survenue d'arthrose fémoropatellaire à long terme.--Chez l'adolescent jeune , s(il faut périr :on ne peut pratiquer de transposition de la tubérosité tibiale antérieure tant que subsite le cartilage de conjugaison , car on risque , par la stérilisation ,d'engendrer un genu recurvatum .--Il faut la technique de G. OLDWAITH qui consiste en une hemitransposition du tendon rotulien .

-3- LES CHONDRO-MALACIES ROTULIENNES

a) - La chondromalacie post traumatique pure qui succède à un choc direct sur la rotule entraînant des lésions chondrales :tenaces , récidivantes , elle est de traitement difficile et décourageante .-- Le plus sovent elle finie pae céder au traitement édical (antiinflammatoire et surtout reeducation isométrique)et au temps .-b)- La chondromalacie habituelle et non traumatique --Entre dans le même cadre que les instabilités .--La douleur , de type rotulien , domine le tableau , parfois sans accident aigu .--Ilexiste un syndrome d'hyper - pression externe(SHPE)-Selon leut gravité , les lésions cartilagineuses sont classée en 4 stades.s--La radiographie ; -Ne montre toujours pas de malposition rotulienne (mais intérêt majeur du scanner étudie les premiers degrés de flexion)--Ne montre pas souvent non plus les signes directs des lésions chondrales , même par arthrographie la aussi) intérêt du scanner et du schuss).--Le diagnostic est avant tout clinique .

-c) -Traitement de la chondromalacie .Avant tout médical et surtout Kinesithérapique , souvent efficace .--Si échec : - Chirurgie - 1)- traitement des lésions chondrales par régularisation, perforation de l'os scléreux sous chondral (PRDIE) spongialisation de la rotule - 2) - section de l' (aileron rotulien externe (FICAT) -3)- Avancée de la tubérosité tibiale (MAQUET)pour diminuer les contraintes fémoro-patellaires .--S'il existe une désaxation de l'appareil extenseur avec subluxation rotulienne , ces gestes s'ajouteront aux interventions de réaxation précédemment décrites ..--Il faut savoir que dans les chondromalacie s dites ''axées'' les résultats sur les phenomènes douloureux ne sont pas constants .--En l'absence de traitement, ces conflits fémoropatellaires ménent , à plus ou moins long terme , à l'arthrose fémoro-patellaire..

FIN de la publication END of MY

Receiving a Merit Award from Mr Foluso Phillips, the President in Council of Igbobi College Old Boys Association (ICOBA) in recognition of my Services to our Great Nation during our 86th Founder's Day Ceremony in Lagos. It was a privilege and honor to have the Vice President of the Federal Republic of Nigeria Prof. Osinbajo who is an Old Student of the College in attendance. Where there is an IGBOBIAN, there is indeed a NOBLE NIGERIAN.

Congratulations to Dr. Lanre Glover from UAMS Executive Board

U·V·F·M·S
Université Virtuelle Francophone de Médecine du Sport

« Prévention des maladies chroniques par l'activité physique et sportive »

Responsable de la formation: **Professeur Michel RIEU**

Certificat habilité par l'Université Senghor

Le rôle bénéfique de la pratique sportive dans la prévention des maladies (prévention "primaire") ainsi que dans la réduction des effets néfastes des pathologies déclarées et des risques de récidives (prévention "tertiaire") est abondamment documenté comme en témoignent les milliers de publications parues dans la littérature scientifique internationale et notamment au cours de la dernière décennie.

Depuis de nombreuses années plusieurs pays comme les Scandinaves, le Québec, les Etats Unis, la Suisse ... la pratique de l'activité physique avait déjà fait déjà l'objet de plusieurs campagnes promotionnelles entrant dans le cadre d'une politique de santé publique nationale avec des résultats qui demeurent cependant difficiles à évaluer.

En France, malgré la position de quelques personnalités médicales isolées et le développement spontané et heureux des activités de pleine nature ou encore du "sport de rue" il a fallu attendre le débuts des années 2000 pour que les pouvoirs publics commencent à s'intéresser à cette possibilité, jusque là négligée, d'améliorer le niveau global de santé de la population par l'activité physique. Ainsi, après le travail d'une commission créée au ministère de la santé en 2001, le ministère de la Jeunesse, des Sports et de la Vie associative passa en 2005 commande à l'INSERM d'une expertise collective dont les conclusions furent rendues en 2008 sous la forme d'un volumineux rapport : "*Activité physique, Contextes et effets sur la santé*".

Mais le chemin est long entre les évidences scientifiques et les applications sociétales. c'est pourquoi il a fallu attendre près de dix années pour que soit officiellement reconnu le bien

fondé de la mise en œuvre d'une politique "sport santé" par le biais de la loi* du 26 janvier 2016 autorisant les médecins à prescrire des activités physiques et sportives aux personnes atteintes d'une maladie chronique. Depuis, cette loi a été précisée par un décret** du 30 décembre 2016 et une circulaire*** du 3 mars 2017.

Néanmoins, la difficulté de la démarche reste entière. En effet il convient maintenant d'organiser à l'échelon national,

- La demande par le biais d'une sensibilisation non seulement des personnes souffrant d'affections chroniques les incitant à la pratique d'une activité physique qui, pour être efficace doit être adaptée, régulière et pérenne, mais aussi du corps médical encore, dans sa majorité, mal préparé à cette nouvelle orientation de leur métier.
- L'offre c'est à dire les structures où pourront s'adresser en toute sécurité les patients concernés.
- L'évaluation :
  en amont, de ces personnes afin de les orienter vers les établissements les plus adaptés à leur état de santé et à leur condition physique ;
  en aval, 1- à l'échelon individuel, de ces mêmes personnes afin de contrôler leur évolution; 2- à l'échelon épidémiologique, afin d'objectiver statistiquement les résultats globaux de la politique Sport/Santé sur les plans sanitaires et économiques.

* Art. L. 1172-1de la LOI n° 2016-41 du 26 janvier 2016 de modernisation de notre système de santé -"Dans le cadre du parcours de soins des patients atteints d'une affection de longue durée, le médecin traitant peut prescrire une activité physique adaptée à la pathologie, aux capacités physiques et au risque médical du patient."

** Décret n° 2016-1990 du 30 décembre 2016 "relatif aux conditions de dispensation de l'activité physique adaptée prescrite par le médecin traitant à des patients atteints d'une affection de longue durée"

*** INSTRUCTION INTERMINISTERIELLE N° DGS/EA3/DGESIP/DS/SG/2017/81 du 3 mars 2017 relative à la mise en œuvre des articles L.1172-1 et D.1172-1 à D.1172-5 du code de la santé publique et portant guide sur les conditions de dispensation de l'activité physique adaptée prescrite par le médecin traitant à des patients atteints d'une affection de longue durée.

L'action de l'Université virtuelle francophone de médecine du sport (UVFMS) s'inscrit dans cette démarche au niveau de **l'offre** en assurant la formation des encadrants sportifs grâce à l'organisation d'un certificat habilité par l'Université Senghor dont l'intitulé est :

"Attestation de formation à la prévention des maladies chroniques par l'activité physique et sportive"

Cette formation s'adresse aux :

- Educateurs sportifs titulaires d'un brevet d'Etat souhaitant approfondir leurs connaissances
- Bénévoles titulaires d'un diplôme fédéral souhaitant acquérir les compétences requises
- Elus associatifs désireux de s'imprégner de la thématique sport/santé

Avec l'objectif général de la prise en charge dans les clubs des personnes totalement autonomes mais dont l'état de santé peut néanmoins être amélioré par une pratique ludique et régulière de l'activité physique :

- Sédentaires en surpoids ou vieillissantes;
- Convalescentes, relevant d'une maladie;
- Souffrant d'une pathologie chronique.

A l'issu de leur formation, les apprenants seront en mesure de posséder les ressources de base permettant de mieux comprendre les pathologies chroniques suivantes : cancers, diabètes, maladies cardio-vasculaires, transplantés, effets de la sédentarité.

Ces éléments permettront aux clubs sportifs dans lesquels sont engagés les apprenants de mieux accueillir les patients atteints de ces pathologies, de leur permettre une activité physique adaptée et de recréer le lien social attendu.

Les ressources présentées dans cette formation constitue un socle de connaissances de base transversal à toutes les disciplines sportives.

Les éducateurs sportifs et les bénévoles affiliés à une fédération qui développe une formation sport/santé spécifique à l'activité sportive fédérale, seront évidemment invités à suivre cette formation.

Celle-ci comprend trois parties :

- Un enseignement en ligne
- Un enseignement en présentiel
- Une vérification des connaissances

Le plan général de formation (56h)

• Consultation des ressources	25 Heures
• Travaux dirigés - QCM	05 heures
• Séminaire en ligne - tutorat	05 heures
• Présentiel	07 heures
• tests – validation finale	04 heures
• Formation continue – CAMPUS	10 heures

1- L'enseignement en ligne

L'enseignement en ligne présente de nombreux avantages : il permet en effet à l'apprenant de se former librement au lieu et à l'heure de son choix et dans un espace personnalisé 24h / 24h. La formation est accessible sur Smartphones et sur tablettes.

La plateforme de formation choisie est *CrossKnowledge* reconnue au plan mondial comme l'un des acteurs majeurs du secteur du Digital Learning. En attestent les nombreuses récompenses attribuées à ses solutions technologiques et ses contenus.

Cette plateforme offre les possibilités suivantes :

- Cours en ligne
- Autoévaluation par QCM
- Travaux dirigés
- Espace d'échanges
- Tutorat avec rendez-vous en ligne

Elle permet une évolution permanente des interfaces de communication permettant une adaptation constante aux besoins formulés par nos apprenants.

Les ressources consultables

Les pathologies :

- ✓ Les cancers : Qu'est-ce que le cancer; Dépistage et diagnostic du cancer; Cancer, effets secondaires; Les soins de support et le suivi; Escrime et cancer du sein.
- ✓ Les diabètes : APS et diabète de type 2; Le diabète c'est quoi ?; L'hémoglobine gliquée; Equilibre alimentaire et diabète; Diabète et activité physique; Sport et diabète.
- ✓ Maladies cardio-vasculaires : Prévention des maladies C.V.; Mort subite du sportif; prévention et mort subite.
- ✓ Obésité
- ✓ Transplantation rénale : Greffés rénaux; Le sport pour les transplantés.
- ✓ Effets du vieillissement : Activité physique et pathologie rhumatismale, ostéoporose; Stratégie préventive des maladies non transmissible (MNT); APS-MNT-Sédentarité; La sédentarité; MNT et vieillissement.
- ✓ Maladies neurodégénératives : Sclérose en plaque et activité physique.

Médecine du sport

- ✓ Alimentation du sportif au quotidien
- ✓ Déshydratation et activités physiques
- ✓ Relaxation et sport
- ✓ Sport et stress
- ✓ Le sommeil facteur de relaxation

Traumatologie

- ✓ L'entraineur face aux pathologie de l'appareil locomoteur : généralité
- ✓ L'entraineur face aux pathologie de l'appareil locomoteur : lésions musculaires
- ✓ L'entraineur face aux pathologie de l'appareil locomoteur : os
- ✓ L'entraineur face aux pathologie de l'appareil locomoteur : cas particuliers
- ✓ Accidents de terrain

Entraînement physique

- ✓ Introduction
- ✓ L'entraînement physique (2)
- ✓ Evaluation de la condition physique
- ✓ Le MET

Les travaux dirigés

Consistent en des études de cas concernant essentiellement l'accueil des personnes souhaitant participer à un programme de remise en condition physique. Les réponses fournies par les apprenants seront analysées et discutées au cours du présentiel.

Le QCM d'auto-évaluation

Ce QCM est ouvert aux candidats ayant consulté l'ensemble des ressources mises à leur disposition dans le respect de la durée exigée (25h, le temps passé étant enregistré par la plateforme). L'épreuve n'a pas pour objectif de sanctionner un niveau mais de permettre à l'apprenant de tester ses connaissances acquises avant d'aborder la formation en présentiel qui va suivre.

L'espace d'échange

Cette section permet d'organiser un tutorat ayant pour but de répondre aux questions pratiques ou théoriques que peuvent se poser les apprenants tout au long de leur parcours de formation. Il peut s'agir de problèmes pratiques ou d'aspects plus théoriques concernant un chapitre particulier de leurs cours. Cet espace permet aussi au tuteur d'intervenir directement auprès d'un élève quand il apparait qu'il éprouve des difficultés voire une forme de démobilisation de sa part.

Des échanges direct entre élèves et enseignants peuvent être aussi organisés à la demande.

2 - Rencontres en présentiel

Présentiel regroupant tous les participants de la session dont le thème central est :

Comment accueillir les personnes en pathologies chroniques.

Il se tient en présence de médecins spécialistes (cancérologue, diabétologue, cardiologue, médecins du sport ...).

- *La matinée est consacrée à ;*

- Retour sur la session
- Analyse des réponses au QCM final et aux études de cas
- Débat sur : "L'activité physique adaptée, les objectifs, les moyens, les limites" consistant en une discussion entre les participants et les médecins présents. Les questions médicales seront abordées, notamment la notion de prescription mais également les aspects des orientations et des adaptations nouvelles concernant les éducateurs sportifs, notions d'évaluation et de suivi

- *L'après-midi est consacrée à l'évaluation de la condition physique*

Elle comprend l'étude des différents tests d'évaluation permettant d'accompagner l'élève vers l'activité physique et sportive de son choix.
Les étudiants organisés par petits groupes de trois effectuent eux-mêmes sous le contrôle des enseignants les QUESTIONNAIRES et TESTS selon le déroulé suivant :

1- Réponse au questionnaire sur l'aptitude physique *Q-AAP et vous* qui permet de détecter un éventuel risque de santé nécessitant une visite médicale.

2- Questionnaire mondial sur la pratique de l'exercice physique (GPAQ) qui permet de quantifier le niveau de pratique hebdomadaire tant dans les domaines du travail, des transports et des loisirs ainsi que d'estimer le degré de sédentarité

3- Réalisation des tests
- Indices anthropométriques
  - IMC
  - Indice taille/hanches
- Aptitude neuro-motrice
  - Equilibre sur une jambe
  - Test de souplesse
- Aptitude musculo-squelettique
  - Force des muscle de la main
  - Force musculaire des jambes
- Aptitude aérobie
  - Test 6 minutes de marche

Les résultats obtenus sont quantifiés sur des grilles de lecture validées et permettent ensuite d'établir un ***profil de forme***

4- La perception de l'intensité de l'effort est estimée par l'échelle de Borg

3 - Vérification des acquis

Cette partie se fera au domicile ou tout autre lieu choisi par le candidat. Justifiant l'ensemble des ressources acquises, elle se fera en ligne sur la plateforme habituelle.
Elle comporte 3 parties qui s'enchainent au fur et à mesure des réponses apportées.

1- A chaque thème, le médecin spécialiste du thème traité présentera en vidéo ce que l'on attend de l'épreuve.
2- S'ouvrira ensuite l'épreuve qui comportera une question ouverte à laquelle l'apprenant devra apporter une réponse
3- Le médecin viendra ensuite apporter sa réponse que l'apprenant pourra aisément comparer à la sienne.

Thèmes abordés :

- Maladies cardiovasculaire
- Cancers
- Maladies métabolique
- Vieillissement

L'ensemble des épreuves étant réalisé, les médecins en feront la correction et vous recevrez ensuite le résultat de votre formation par email.

La validation de celle-ci permettra de recevoir

« L'attestation de formation à la prévention des maladies chroniques par l'activité physique et sportive »

Conclusion

1 - La démarche des éducateurs sportifs s'inscrit dans « **le parcours de soins de leur élève** » c'est à dire dans un parcours des patients qui débute à l'hôpital, se poursuit en centre spécialisé de rééducation physique pour aboutir à une pratique dans un des club dont les Éducateurs sportifs ont été formés à accueillir cette nouvelle population.

Il convient d'insister sur le fait que seule la continuité de l'action peut permettre d'apporter au patient le bénéfice scientifiquement validé de l'activité physique

2- La tenue rigoureuse **du profil de forme** constitue un moyen de suivi et d'évaluation dans le temps de l'élève permettant également un lien entre le médecin traitant et l'équipe pédagogique.

Il permet ainsi de pointer les adaptations nécessaires à l'activité physique et sportive choisie par l'élève (ex: amélioration de l'endurance qui peut se faire par quelques séances supplémentaires dans la section Athlétisme du club omnisport…)

Afin que les résultats soit interprétables d'un moment à l'autre et/ou d'un éducateur à l'autre, et exploitable sur le plan statistique, il est essentiel que les protocoles de passation des tests, tels qu'ils sont décrits dans la formation, soient rigoureusement respectés.

3 - La relation entre l'éducateur sportif et l'équipe soignante, notamment le médecin traitant, reste à établir. La constitution à l'échelon au moins régional sinon national, d'un **livret de suivi** regroupant des informations médicales et "sportives" parait éminemment souhaitable afin que la pertinence de la démarche *Sport/Santé* puisse être évaluée à titre individuel et sur le plan épidémiologique.

U·V·F·M·S

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IMPACT DU CANNABISME DANS L'APPRENTISSAGE DU MOUVEMENT GENERAL EN RUGBY à XV OBSERVE DANS DEUX CLUBS DU QUARTIER A MADAGASCAR

Dr. Jim

Il se rapporte sur les joueurs de rugby dans le club de quartier le TFA et les AMAZONES qui ont été observés suivant l'apprentissage du mouvement durant deux mois d'observation.

LE MOUVEMENT GENERAL : c'est une phase qui met en œuvre l'intelligence de jeu d'un joueur et sa capacité technico-tactique selon la situation rencontrée. Généralement, la progressivité des thèmes d'apprentissage en rugby respecte la logique suivante :

Jeu en mouvement phase de fixation - phase statique

Le résultat de l'enquête et l'observation, nous aident à comprendre la réalité dans les clubs du quartier et l'environnement du rugby Malgache.

Dans une première constatation, on observe des groupes de jeune joueur qui fument du cannabis même au bord du terrain d'entrainement avant de pratiquer le jeu ou le cas contraire après l'entraînement.

En revanche, des joueurs à la quarantaine d'âge qui sont dépendants du cannabis et devenus une mauvaise référence pour les jeunes .C'est le cas du club de quartier qui dépendent surtout l'expérience des anciens. Il s'agit d'un problème très sérieux car il touche de plus en plus les clubs de quartier en voyant la couleur des maillots, des drapeaux et les tee-shirts de couleurs rouge- jaune-verte qui représentent la culture des rastas.

Deuxièmement, lors des matchs, des séances de formation de rugby quelques soient les endroits, l'existence des places qui sont réservés aux fumeurs de cannabis qui n'hésitent pas à fumer publiquement. Cette image nuise la valeur de rugby Malgache. C'est déplorable mais c'est la réalité.

On a remarqué aussi que le mode de consommation se fait toujours par groupe ; Ils savent que le cannabis est un produit dopant et interdit par la loi, donc constituer un groupe c'est devenu une force pour y exister et résister dans une société, en plus c'est l'un des moyens pour intégrer et d'appartenir à un groupe.

D'après l'enquête, les joueurs prennent du cannabis entre 15 à 45 ans.

En conséquence,

sur le plan moteur, Il y a un dysfonctionnement au niveau de coordination motrice et neuromusculaire (ex : détente musculaire) surtout les jeunes joueurs et les âgés dans ce domaine. Leur façon de courir avec la balle ont tendance à planer ,d'autre foncer à tête baissée sans soucier les soutiens et surtout sans mettre de l'incertitude chez les opposants. La majorité n'arrive pas à appliquer les attitudes et les comportements attendus lors d'un contact ou évitement. Pourtant, le rugby sollicite toujours des rapports de force.

Sur le plan technique, la plupart des joueurs

n'ont pas les bagages techniques pour faire le jeu de rugby parce que la formation selon les étapes n'est pas respectée. En plus, ils ne se contentent d'améliorer leurs performances. C'est devenu un handicap à part la mauvaise habitude de consommer le cannabis.

Dans un autre point de vue, les exigences du rugby sur la condition physique sont très importantes que ce soit la force, la vitesse ; l'explosivité et la puissance. Les joueurs cannabinomanes qui fument avant l'entraînement ont de problèmes de récupération et surtout la gestion des énergies puisque pendant le jeu, il ya toujours des moments fort et faible et des régulations permanentes.

Le CANNABIS

C'est une plante qui contient du THC « TetraHydroCannabinol », une substance psycho active ou psychostimulante qui agit sur le SNC .L'intensité des effets de cette plante dépend de sa concentration en THC ,très variable selon la variété, la provenance et la préparation. Une tige de cannabis contient 2 à 5 mg de THC dont la moitié seulement est absorbée lors de l'inhalation. La teneur en THC varie grandement selon les variétés .Ce qui explique en partie les différences d'effets rencontrés chez les usagers.

Les effets du cannabis sur le psychisme se manifestent pou une dose de l'ordre de 0,05mg/kg de THC absorbé. Le pic plasmatique est atteint plus rapidement lors de l'inhalation que par la prise, mais la concentration plasmatique décroit plus lentement dans ce cas. Le demi-vie plasmatique est courte ; il existe une fixation tissulaire maximale dans les tissus riche en lipide, c'est-à-dire le THC est stocké dans les graisses en particulier le gonade et le cerveau .

Mode d'action du Cannabinoide sur les cellules du cerveau :

Au niveau du Cortex : donne de L'euphorie

Hippocampe : affaiblissement de mémoire à court terme

Striatum : réduction de l'activité motrice (détente musculaire)

Cervelet : trouble de coordination motrice

Effets physiques à court terme

- Sécheresse de la bouche et de la gorge,
- dilatation de la pupille et yeux rouge
- Augmentation du rythme cardiaque, modification de la pression artérielle
- Détente musculaire
- Ralentissement des reflexes ou inversement une excitation
- Difficulté de concentration, allongement du temps de réaction
- Trouble de l'attention, pensée fragmentaire
- Trouble de la locomotion et vertige (lors du passage à la station debout en particulier)
- Baisse de la température du corps, sensation de froid
- En cas de surdose, trouble circulatoire et vomissement

Effets psychologiques à court terme

- Modification de l'état de conscience, perception exacerbée de la lumière et de la musique
- Grande faculté d'association
- Euphorie et desinhibition
- Sensation agréable de détente, de la légèreté, de bien être, sentiment de communauté
- Conscience accrue de soi, indifférence et détachement vis-à-vis de l'environnement
- Etat occasionnel et atypique de désorientation, de confusion, d'angoisse, de panique et de délire avant tout lors de surdose.

En bref, certains effets de cannabis se manifestent en général par la baisse de l'attention et de la concentration, modification de la motricité et de la coordination, difficulté d'appréciation de situation gênante. De même, une consommation régulière de cannabis est en relation avec de l'anxiété et la dépression, et peut entraîner une légère dépendance physique. La dépendance psychologique doit être prise beaucoup plus au sérieux.

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- Dr William LOWENSTEIN, Jean Pierre TAROT, Rham olivier&Pierre SIMON. Le drogue.EJL.2005,92.libriosanté.

SUGGESTION : mesure préventive

Comme nous avons vu, le cannabis fait partie du monde du rugby dans notre pays. La prévalence des fumeurs reste élevée et devient plus en plus très dangereuse sur le monde de rugby Malgache et la société en générale. Nous suggérons alors quelques solutions qui paraissent essentielles.

La CCC : communication pour le changement de comportement

Alors idéal, c'est encore d'être informé et d'informer les joueurs, surtout les très jeunes pour leur faire prendre conscience l'importance de la fonction du cerveau et la santé en général.

L'ouverture de dialogue notamment entre le médecin du sport et les dirigeants du club, les éducateurs, les entraîneurs, la fédération, les ligues, les sections, surtout les parents et les joueurs pour les effets néfastes du cannabis le plus tôt possible avant que les jeunes n'y soient confrontés.

L'IEC : Information, Education et Communication

Les jeunes joueurs qui sont déjà dans un mode épisodique devraient être incités à réduire progressivement la fréquence de leur consommation, voire à la stopper, pour qu'ils n'entrent pas dans une consommation régulière et quotidienne (passage à l'habitude).

Il faut donc privilégier les approches individuelles de conseil et de dialogue.

Quant aux jeunes cannabinomanes réguliers voir quotidiens en situation de risque élevé, il faut les inciter au changement de comportement, c'est-à-dire à l'arrêt définitif ou au moins à une réduction significative de leur consommation.

Le rôle des éducateurs est très primordial dans ce domaine de conseil parce qu'il doit connaître parfaitement ses joueurs et de leur orienter petit à petit selon le rythme de l'évolution sur le plan psychologique, physique et technico-tactique.

CONCLUSION

Le cannabis reste une mauvaise culture et habitude dans le monde du rugby de quartier car la plupart des joueurs sont habituellement fréquentés à ce produit.

Nous avons pu mettre en exergue la gravité de situation de 30 à 33% de joueurs fumeurs, la précocité des jeunes de quartiers défavorisés par rapport à d'autres , des difficultés sur le plan technique, tactique, psychologique et surtout l'intelligence de jeu de situation. Ce qui est frustrant, beaucoup d'entre eux ignorent les effets néfastes du cannabis. Nous avons suggéré plusieurs moyens préventifs pour aider les joueurs à passer ce produit. C'est que tout le monde doit s'entraider pour conscientiser la société.

Clinical Imaging Guidelines (CIG)

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A Secretory General, Egyptian Society of Radiology

1. A significant number of radiological investigations do not fulfil the imaging guidelines aims (inform by clinical management and/or add confidence to the clinicians diagnosis) and may add unnecessarily to patient irradiation. In addition leads to misuse of personnel, machines and consumables.

2. Clinical Imaging Guidelines are regulations imposing responsibilities on imaging departments to ensure that all exposures to ionizing radiation are justified and that the doses are optimized.

3. Pre examination mistakes in medical imaging are not less important than technique, perception and interpretation errors

1- Inadequate clinical data (history & examination)

2 - Unavailable previous studies.

3 -False choice of imaging modality or technique

4 - Delayed date of examination without reviewing recent clinical data

5 - Improper preparation
- Bowel over distension
- Improper fasting
- Improper U.B filling

Vitality of Imaging Referral guidelines Implementation projects

1. Such projects have become so vital for the use of radiology departments and improving the quality of health care that they were introduced in the Medical Exposure Directive as a legally-binding requirement for EU Member States.

2. Subsequently, the European Commission launched a project to develop European referral guidelines, which were first published in the UK.

3. A regulated member must recognize his or her limitations in the delivery of patient care and collaborate as appropriate with other healthcare providers for the benefit of the patient.

4. One of the most important conditions for the work of health insurance hospitals in European countries is to ensure their application of the principles of Clinical referral guidelines.

Stratification of recommended investigations is based on:

1. Evidence-based diagnostic impact.

1. The best test is ensured for the clinical indication

2. systemic review of literature

3. consensus from different experts

4. Radiation effective dose.

5. Low or no dose investigations are promoted

6. Cost-effectiveness.

General rules:

Clinician should ask a question and wait for clarification or clear answer.

Radiologist should describe everything as crime investigator as any word could be the key for

diagnosis.

Subspecialty should be encouraged to enhance practice

Discussing reports with radiologists is better than interpreting it by clinician then ask radiologist.

Clinician could be efficiently interpret special radiographs but the problem is that radiograph does not

Show one system or organ but others which could be the cause of patient complaint.

Look for a lesion and assess patient globally not

for a system or organ.

Recommendations:

1. Indicated: the investigation most likely to contribute to clinical diagnosis and management.

2. Not indicated initially, clinical problem usually resolves with time performing it if symptoms continue e.g shoulder pain.

3. Not indicated routinely: back-pain in whom there were clinical findings to suggest something more than degenerative disease.

4. Specialized investigation. Complex or expensive investigations asked only by certain clinician in each department, often justify individual discussion with a consultant radiologist.

A useful investigation is one in which the results positive or negative, will alter management or add

Confidence to the clinician diagnosis.

Choice depends upon:

1. Clinical data.

2. Availability of imaging modality

3. Availability of technique

4. Availability of personnel

5. Dependable personnel

6. Emergency cases

Justification:

1. Process in which the referring health care provider and radiologist make a decision as to whether the examination is clinically indicated and whether the benefits outweigh the likely radiation risks

2. There are estimates that a significant fraction of examinations are unjustified

3. Avoid repeate examinations and multiple phase scans.

Optimisation:

1. ALARA principle states that dose should be kept As Low As Reasonable Achievable

1. But not to the extent that compromises diagnostic image quality

2. As the dose and risk increases benefits should be greater

Causes of the wasteful use of radiology are:

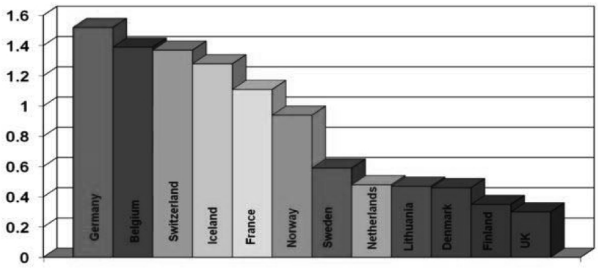
1. Repeating investigations which have already been done

2. Investigation when results are unlikely to affect patient management

3. Investigating too often

4. Doing the wrong investigation.

5. Failing to provide appropriate clinical information and questions that the imaging investigation should answer.



Self-referral:

Physician self-referral is a term describing the practice of a physician ordering tests on a patient that are performed by either the referring physician himself or a fellow faculty member from whom he receives financial compensation in return for the referral. Examples of self-referral, a surgeon suggesting an operation that he himself would perform, and a physician ordering imaging tests that would be done at a facility he owns or leases.

Fee splitting:

1. This is essentially the payment of a commission to the referrer with the express intention of ensuring that the referring doctor directs referrals of patients to the payee.

2. In most parts of the world, the practice is considered unethical and unacceptable, hence fee splitting is often covert. The reason it is believed not to be in the interests of patients is because it represents a conflict of interest which may adversely affect patient care and well-being, since patients will not necessarily be referred to the most appropriate doctor to provide their on-going care but will instead be referred to those doctors or hospitals with whom the referring doctor has a "fee splitting" or commission payment type of arrangement.

Why are guidelines needed?

1. Best imaging for patient

2. Elimination of unnecessary imaging

3. Reduction in radiation

4. Optimization of cost and service

5. Guidelines must exist in order for insurance companies to pay for an imaging investigation.

6. The IAEA is hoping to tackle the problem with its "AAA" initiative, promoting Awareness about radiation risks; Appropriateness to ensure that those referred for radiological examinations really need them; and Audit to check the effectiveness of the referral and related processes.

The guidelines are available to purchase as:

1- An online version

2-an app (available for Android or iOS)

3-a booklet.

4-The Royal College of Radiologists has pub-

lished guidelines for >20 years since 1989. 8th editionIn 2017.

The guidelines are implemented to avoid:

1. Repeating investigations which have already been done.

2. Investigation when results are unlikely to affect patient management.

3. Too often Investigations.

4. The wrong choice of investigation.

5. Increase of radiation hazard.

Technical Meeting on Justification of Medical Exposure and the use of Appropriateness Criteria

Vienna 2015

Stratification of recommended investigations is based on:

1. The best test is ensured for the clinical indication

Per person annual collectivedose from diagnostic medicalexposure

Per caput annual

Collective dose/mSv

Hart et al. 2010

30% of all CT examinations were NOT justified

o CT Lumbar spine - 77%

o CT head - 36%

o CT abdomen - 37%

1. reduced 20% exams

2. potential for 44% reduction

3. reduce imaging costs by 39%

4. Reduce radiation dose by 44%.

Benefits of Computer (web)-based Viewing Systems:

1. Hardcopy studies are no longer misplaced or lost- eliminates films

2. Multiple physicians may access same patient films

3. Patients do not have to wait in Radiology for films once study is completed

Teleradiology:

1. Has gone global. Driven by the explosion in night-call coverage and a concomitant slump in the radiology workforce, the idea of sending images around the world has taken a new twist. Radiologists are seeing the potential to exploit global time differences as a way to turn night duty into day.

2. It's an attractive image to many radiologists: the thought of sipping a cool drink under a palm tree on some idyllic island before flipping open their laptop to read incoming studies.

Conclusion:

1. Plain radiographs are usually the starting point

2. US, CT , MRI and isotope scanning have specific indications , advantages and disadvantages

3. Clinical history and previous examination are essential for choosing the best imaging modality and technique.

4. A specific question is helpful to get a clear answer When in doubt, ask for MSK Radiologist

5. Radiology is a double edged sword, Mistakes lead to consumable abuse , radiation exposure , false or delayed diagnosis thus improper treatment, increase morbidly and mortality

Referring Physician should pay attention to: patient data, previous exams, Awareness by imaging modalities and ethical concern, choice of good radiologist and department, communication with radiologist.

Radiologist should choose the best imaging modality, manage technique, communication with patient and referring physician, careful interpretation and proper reporting.

If all speak to those instructions, you'll gain more from medical imaging.

Physical activity: Evidence for the Anti-aging effects in elderly

Prof. Moatasem Salah Amer, Prof. Doha Rasheedy

Abstract:

Searching for the best anti-ageing therapy is the target of modern preventive research. Physical activity demonstrated multisystem benefits as well as multiple potential anti-ageing effects.Many cellular ageing processes can be attenuated by physical activity. However, existing human model data is limited and insufficient, and there is a lack in the interventional trials to determine the age of onset, type, duration, frequency and intensity of the optimum anti-ageing exercise program.

Background:

Greying of the population is an emerging global phenomenon attributed to medical advances worldwide.1This growth in the elderly population led to the emergence of the concept of healthy ageing which is a multidimensional phenotype describes growing old without physical disability, and with preserved cognitive, affective and social functioning.2

Over the last 30 years, a growing body of evidence suggested that regular physical activity (PA) and exercise are important lifestyle factors contributing to healthy ageing. Regular physical activity has been associated with favorablephysiologic and psychosocialoutcomes in old age 3-5

Higher levels of PA and cardiorespiratory fitness were associated with lower risk of all-cause mortality in both genders. 6-10 even among the very old 11

Evidence supports that PA is associated with reduced risk of several age-related diseases.Physicalactivity plays a major role in the treatment of coronary heartdisease12, hypertension 12and peripheral vascular disease.13It allows for better glycemic control 14 and management of obesity 15and dyslipidemia.16

Moreover, PA prevents many geriatric syndromes. It preserves bone mass, 17 enhance balance18, and prevents falls and related fractures.19It is also associated with delayed cognitive decline.20, 21

Preventive research continues to search for the best anti-ageing agent. To date, PA is thought to be the safest anti-ageing therapy. Although, it cannot reverse the aging process, it can attenuate many of its deleterious cellular effects. 22

Cellular evidence forthe anti-ageing effects of physical activity:

Cellular ageing has been discussed as a complex process involving multiple interrelated pathways.Thisprocess involves the accumulation of toxic metabolites, mitochondrial dysfunction, nuclearDNA damage, proteostasis loss, limited cellular proliferative capacity, extracellular signaling and epigenetic remodeling.23

To date, few researchesaddressed the anti-ageing effects of physical activity in elderly population. In the following section, we will demonstrate the initial data obtained from these studies:

1. Effects of PA on Nuclear and mitochondrial DNA damage:

The DNA damage theory of ageing suggests that unrepaired NuclearDNA (nDNA)damage fromcontinuous exposure to different toxic agents-such as reactive oxygen species(ROS), UV radiation and other environmental mutagens, is the direct cause of cellular ageing.24,25

The free radicals are associated with oxidative modifications and replicative errors of DNA bases,

which; subsequentlyimpair gene expression, transcription, arrest cell cycleand trigger apoptosis. Mitochondrial DNA (mtDNA) is more susceptible to damage than nDNA because mtDNAlacks histoneproteins and is closer to the site of ROS production.mtDNA damage contributes to the ageing process by altering the functionality of mitochondrial proteins.26

A 4-month aerobic exercise program implemented at old age was associated with increasedskeletal muscle mitochondrial content and markedly upregulated transcriptional regulatorsof mitochondrial biogenesis. There was increased geneexpression of both the peroxisome proliferator-activatedreceptor_-coactivator-1_and the mitochondrialtranscription factor A but not in nuclear respiratory factors 1and 2. 27

In another study, regular endurance exercise increased skeletal muscle mtDNA. Thelevels of peroxisome proliferator-activated receptor_-coactivator-1_ and the mitochondrial transcription factor A and nuclear respiratory factors 1 were higher in trained compared to sedentary subjects.28

Resistance exercise programs failed to achieve similar results on mtDNA compared to endurance exercise. The whole-body resistance exercise training for 14 weeks in elderly was associated with a 17.5% decrease inurinary 8-hydroxy-2' -deoxyguanosine (8-OHdG) (A critical biomarker of oxidative stress). However, there was no apparent change in normal mtDNA content or visible mtDNA deletion products.29

2. Effects of PAon telomere length:

Telomere length has been introduced as a cellular marker for biological aging, the limited cellular proliferative capacitydue to telomere depletion explained the theory of replicative senescence or Hayflick limit.30 Telomere length was described as the biological clock limiting the somatic cells replication.31

Recently, many observational studies assessed the impact of physical activity on leukocyte and skeletal muscle telomere length. The athletes were found to have longer telomere lengths than non-athletes even in the elderly. It was noted that regular PA attenuated age related telomere attrition. However, these findings may beinfluenced by other confounders including changes in telomerase activity, oxidative stress, systemic inflammation, and decreased stem cells.32

3. Effects of PAon stem cells:

Aging is a universal process ofdecreased tissue homeostatic and regenerative capacities, caused by degenerative changes of different adult stem cells. This degenerationresults from accumulation of DNA damage and toxic metabolites over time, defective proteostasis, and mitochondrial dysfunction along with systemic factors such as chronic inflammation.33

Whether aged stem cells can be reset to a more youthful state is the field of extensive research, human models found that physicalexercise for 12 weeks enhanced the endothelial repair capacity of the endothelial progenitor cells of elderly men by increasing chemokine receptor four (CXCR4)/ Janus kinase-2 (JAK-2) signaling.34

Another example of thereactivating aged stem cells was encountered in elderly with sarcopenia. There was a reduced number and self- renewal capacity of myogenicsatellite cells (SC) present in atrophic type II musclefibers. After 3 months of resistance exercise training, there was a significant increase in muscle mass and strength in healthyelderly men. Resistance exercise enhanced SC proliferation and differentiation, type II muscle fiber SC content increased from 0.048 ± 0.003 to 0.084 ± 0.008 SCs per fiber ($p < .001$).35

4. Effects of PAon epigenetics:

The addition or removal of epigenetic tags to DNA by methylation/demethylation, acetylation/ deacetylation, phosphorylation/ dephosphorylation,histone modification or microRNA expression modifies gene expression in response to environmental stimuli including physical exercise allowing for metabolic adaptation after exercise.36

In a recent meta-analysis, older adult experienced exercise associated decreased methylation of DNA of tumor suppressor genes suggesting thatexercise-associated DNA methylation modificationcan turn the epigenetic clock back.37

More interestingly, the anti-inflammatory effect of aerobic exercise was attributed to increased methylationlevels of the pro-inflammatory apoptosis-associatedspeck-like protein caspase (ASC) gene, which encode for age related pro-inflammatory rise in IL-1band IL-18 in the leukocytes of old people.38

5. Effects of PAonproteostasis:

Ageing is associated with impaired proteostatic

mechanisms such as autophagy and the ubiquitin–proteasomesystems. Combined exercise programs (aerobic and resistance exercises) enhanced autophagy in old women. The interventional group demonstrated a three-fold rise in messenger RNA levels of the autophagy regulators (Microtubule-associated proteins 1A/1B light chain 3B (LC3B), Autophagy-related protein 7(Atg7), and lysosome-associated membrane protein-2 (LAMP-2)) compared to controls.39

In conclusion, many of the processes involved in cellular ageing can be attenuated by regular physical activity.These benefitscan be achieved in olderpopulation. However, despite these promising findings in human models, further research is needed to explore the molecular bases of exercise as an anti-ageing intervention. The optimum exercise program (types, frequency, duration, and intensity) for older people should be investigated.

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BCAA Benefits

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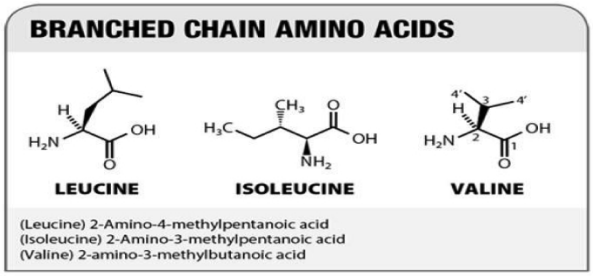
Branched-chain amino acids (BCAAs) are a group of three essential amino acids:Leucine, Isoleucine and Valine. BCAA supplements are commonly taken in order to boost muscle growth and enhance exercise performance. They may also help with weight loss and reduce fatigue after exercise.

What Are BCAAs?

Leucine - Isoleucine - Valine essential amino acids are grouped together because they are the only three amino acid to have a chain that branches off to one side.

Their molecular structure looks like this:



Like all amino acids, BCAAs are building blocks your body uses to make proteins.BCAAs are considered essential because, unlike non-essential amino acids, your body cannot make them. Therefore, it is essential to get them from your diet.

How Do Branched-Chain Amino Acids Work?

BCAAs make up a large chunk of the body's total amino acid pool. Together, they represent around 35–40% of all essential amino acids present in your body and 14–18% of those found in your muscles. Contrary to most other amino acids, BCAAs are mostly broken down in the muscle, rather than in the liver. Because of this, they are thought to play a role in energy production during exercise.

Benefits of BCAA :

BCAAs May Reduce Fatigue During Exercise

Consuming BCAAs may help reduce physical and mental fatigue. Studies in human participants report up to 15% less fatigue in those given BCAAs during exercise, compared to those who were given a placebo.

In one study, this increased resistance to fatigue helped the BCAA group exercise for 17% longer before reaching exhaustion, compared to the placebo group.

In another study, participants were put under heat stress during a cycling test. They were asked to ingest either a drink containing BCAAs or a placebo. Those who drank the BCAA drink cycled for 12% longer than the placebo group. However, not all studies found that decreased fatigue caused improvements in physical performance .In addition, BCAAs may be more effective at reducing exercise fatigue in untrained compared to trained individuals .

Bottom Line: In some people, BCAAs may help reduce exercise fatigue. Whether this improves exercise performance is still up for debate.

BCAA Supplements Reduce Muscle Soreness

BCAAs may also help your muscles feel less sore after exercise.

One way they may do so is by lowering blood

levels of the enzymes creatine kinase and lactate dehydrogenase, which are involved in muscle damage. This may improve recovery and provide some protection against muscle damage .

Various studies asked participants to rate their muscle soreness levels after performing certain strength-training exercises.Participants who were given BCAA supplements rated their muscle soreness levels as much as 33% lower than those given a placebo . In some cases, those given BCAAs also performed up to 20% better when they repeated the same strength-training tests 24–48 hours later .However, effects may vary based on your gender or the total protein content of your diet .

Bottom Line: BCAAs taken before or after strength training may reduce muscle soreness following your workout. However, the effects may vary from one person to another.

Dosage Instructions

A World Health Organization report from 1985 states that the average adult should consume a minimum of 15 mg of BCAAs per pound (34 mg/kg) of body weight each day. However, according to more recent research, the daily requirements may actually be as high as 65 mg/lb (144 mg/kg) of body weight per day .

Based on these newer studies, healthy adults should aim to consume:

• Women: A minimum of 9 grams of BCAAs per day

• Men: A minimum of 12 grams of BCAAs per day

People who include sufficient protein-rich foods in their diets most likely do not need to take supplements.However, daily requirements may be slightly higher for athletes and people doing heavy resistance training. In these cases, supplements may be beneficial.

Most of the studies observing the benefits in trained individuals used supplement doses ranging from 10–20 grams of BCAAs per day.

The best time to take BCAA supplements is before and/or after your workout. Many people who are trying to gain muscle also take them in the morning and before bed.

Top Food Sources

Luckily, there's a large variety of foods that contain BCAAs. Those with the highest amounts include:

• Meat, poultry and fish: 3–4.5 grams per 3 oz (84 grams)

• Beans and lentils: 2.5–3 grams per cup - Milk: 2 grams per cup (237 ml)

• Cheese: 1.4 grams per 1 oz (28 grams) - Eggs: 1.3 grams per large egg

• Safety and Side Effects

•

• Taking BCAA supplements is generally safe and without side effects for most people.

• Studies on the safe upper intake levels of BCAAs are rare, but studies report that total BCAA intakes between 15–35 grams per day seem generally safe.

• However, BCAA supplements are not recommended for those suffering from ALS, also known as Lou Gehrig's disease.

• In addition, individuals with a rare congenital disorder called maple syrup urine disease should limit their intake of BCAAs because their bodies cannot break them down properly.

• Bottom Line:

• BCAA intakes of 15–35 grams per day are considered safe for most people. However, those with ALS or maple syrup urine disease should limit their intakes.

"Sport Psychology"

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What is sport psychology?

Sport psychology is concerned with the psychological foundations, processes and consequences of the psychological regulation of sport-related activities of one or several persons acting as the subject (s) of the activity. The focus may be on behaviour or on different psychological dimensions of human behaviour, i.e. affective, cognitive, motivational or sensori-motor dimensions.

The physical activity can take place in competitive, educational, recreational, preventative and rehabilitation settings and includes health-related exercise. Subjects are all persons involved in the different sport and exercise settings, e.g. athletes, coaches, officials, teachers, physiotherapists, parents, spectators etc.

How is sport psychology constituted?

Sport psychology as a scientific discipline, as well as a professional field, is loosely associated with, and draws upon, the three areas of (1) sport practice, (2) psychology and (3) other sport sciences. These areas are considered equally valid. All of them have a bearing on the topics, the theoretical foundations, the methodological approaches, and the scientific and ethical standards of sport psychology.

What may sport psychology contribute to sport?

Sport psychology as a scientific discipline and professional area furthers the understanding of sport. It analyzes, assesses and directs activity in all aspects of sport by means of psychological processes. Thus sport psychology has a responsibility for well-being, the attainment and maintenance of health, and the improvement of performance. Sport psychology may support the individual or the group with the aim that the actions of the subject master the requirements of the task, fit with situational demands and constraints, and are appropriate to the subject's abilities and needs.

Sport psychology gives the body of knowledge that contributes both to the personal growth and development of the subject and to the formation of the conditions under which exercise and sport are performed.

What do people in sport psychology do?

We use the term 'sport psychologist' in a broad sense including all qualified persons working in the field, independent of their academic education.

• Sport psychologists have three interrelated tasks:

Research: Research is needed to understand the psychological regulation of activity in the setting of sport. The following types of research are conducted: Theoretical or empirical, basic and applied, laboratory and field studies. All contribute to the construction of a specific body of knowledge.

Education: Sport psychology is an important subject in the education of almost every person involved in sport. Three different groups of people may be given knowledge and competence in sport psychology: a). on an academic level, students in psychology, the sport sciences and physical education; b). on a professional level, psychologists moving into the field of sports, coaches, training supervisors, officials and administrators; and finally c). sport participants, e.g. top level athletes, health-related exercise participants, participants in adventure sports, or rehabilitation patients.

Application: Knowledge and competence in sport psychology may be applied to two main functions, namely (1) diagnosis and assessment (e.g. talent detection, testing of cognitive or sensorimotor skills, or evaluation of the needs of participants), and (2) intervention (e.g. guidance in cooperation with – other responsible persons in the field, counselling, or consulting in special problem situations).

• Sports psychologists can work in a range of fields

- Arrange programmes for teams
- Coaching professional and amateur athletes

and coaches
- Sports organizations
- Youth development programmes
- Student teams and coaches
- Helping players to cope with injuries

Individuals will usually specialise in either sports or exercise. It is rare to practice in both. Sports psychologists work with sports men and women across teams and individual sports, both amateur and professional. They aim to prepare athletes psychologically for competition and enable them to deal with both competition and training. They may help athletes to deal with the stressful and demanding aspects of their professional, help coaches build team cohesiveness, help athletes deal with the emotional consequences of injuries and so on. Exercise psychologists are mainly interested with the application of psychology to exercise participation and motivating the general public. This may include encouraging people to see the benefits of exercise, encouraging individuals to set goals.

Sports psychologists (usually holding a degree or much higher qualification) may provide Clinical services, or be involved in research, or may be involved in teaching. Sports and exercise psychologists will work in a range of sports and exercise sectors and work with a range of clients. Sports psychologists will generally combine consultancy work with research or psychological consultancy in other areas, eg. Clinical psychology. Some sports psychologists may hold positions within government organizations or national governing bodies for sports. The opportunities to work full time as a sports psychologist are increasing in number.

Exercise psychologists have similar opportunities. They may work in consultancy with teaching and research careers. Much of their work may require referrals from doctors, and setting up and evaluating exercise programmes in prisons, employment and psychiatric situations. There may also be consultancy work within an office or at competition venues, clinics, recreational settings and so on. Sports and Exercise psychologists will usually require a degree and further qualifications to work in this field. Experience is also very important.

Duration 100 hrs (study at your own pace, on average taking 4-6 months part time)

What is the role of Sport Psychology for Coaches ?

Provides information that coaches need to help athletes build mental toughness and achieve excellence—in sport and in life. As a coach, you'll gain a big-picture perspective on the mental side of sport by examining how athletes act, think, and feel when they practice and compete. You'll learn to use such mental tools as goal setting, imagery, relaxation, energization, and self-talk to help your athletes build mental training programs. You'll also see how assisting your athletes in developing mental skills such as motivation, energy management, focus, stress management, and self-confidence leads to increased enjoyment, improved life skills, and enhanced performance. And you'll discover how to put it all together into mental plans and mental skills training programs that allow your athletes to attain and maintain a mind-set that fosters peak performance.

An essential part of any coaching curriculum, Coaches Guide to Sport Psychology helps students understand the key concepts of sport psychology and develop the psychological skills they need to be effective coaches. Renowned sport psychologist Rainer Martens shows them how to formulate a coaching philosophy and sharpen their leadership and communication skills.

Numerous examples, checklists, and self-evaluation forms show students how to teach such important skills as:
- Imagery
- Psychic energy management
- Stress management
- Attentional skills
- Self-confidence

Breathing

Whate is The Importance of the Breath?

As it is well known, people cannot live very long without breathing. People die when they breathe in but not back out or when they breathe out but not back in. So it can be said that 'breathing is life'. However, this is only its importance at the normal level, which is not yet related to exercise of the mind. Generally, everybody lives while they are breathing, regardless of whether or not they are mindful of it. The importance of breathing, as referred to in this paper, relates to its importance in terms of mind development.

One can obtain the many benefits of mind development by simply concentrating on the air that one breathes and by not letting it pass away uselessly and wastefully.

1. Breathing in long (duration), one knows, "I am breathing in long". Breathing out long, one knows, "I am breathing out long".

2. Breathing in short (duration), one knows, "I am breathing in short".

3. "Realizing the whole process of breath, I shall breathe in";

Thus one trains oneself. "Realizing the whole process of breath, I shall breathe out"; Thus one trains oneself.

4. "Calming the breath, I shall breathe in"; Thus one trains oneself. "Calming the breath, I shall breathe out"; Thus one trains oneself.

Step 1. One knows the long breath in and out as a long breath in and out. Naturally, the strength of the air passing with the in and out breaths is not equal for both nostrils. Sometimes it is stronger for the right side than for the left side or vice versa. One should observe this for oneself and then concentrate on the stronger side.

Natural breathing is always manifested as considerably longer breaths. So it is advised that one should be conscious of the long breaths first and then of the short breaths later. Short breaths usually occur when the physical state is not normal. For normal people, the breath tends to be long.

In this step, when one is breathing a long breath, one should know that this is so. When breathing, if one is not aware of whether the breath is short or long, or knowing that it is short or long, but not knowing whether it is an in-breath or an out-breath, then such a person is regarded as not yet having accomplished this step. One is considered to be successful in the first step only when one knows a long in-breath as a long in-breath and a long out-breath as a long out-breath.

Step 2. One knows the short breath in and out as a short breath in and out. One also knows the length of the short breath when one is actually taking a short breath. Natural breaths tend to be long but tend to get shorter when the one is not normal, for example, when one is angry, afraid, sad, tired, or when one loses one's temper. This second step is not fulfilled as long as one is not aware of whether the breath is a short breath in or out. One accomplishes this step only when breathing in a short breath, one knows "I breathe in a short breath" and when breathing out a short breath, one knows "I breathe out a short breath".

However, it is not easy to be conscious of the long in and out breaths or the short in and out breaths because the mind, in its natural state, always tends to waver, wander, and struggle and can be very hard to control. It is like a small baby who cannot stay still or like a naughty monkey that keeps running along the branches of the trees all the time, never being quiet and still. Therefore it is hard to discipline the mind, especially for those new to the practice of meditation..

Step 3. One trains oneself to experience the whole breathing process as one breathes in and out. At this step, one observes and knows the whole process of breathing, both long and short breaths. One feels the air touching the three points i.e. the nose-tip, the middle of the chest, and the belly. The starting point of the in-breath is the nose-tip, then the air flows in to touch the middle of the chest, and then it ends at the belly. Then the breath turns around and goes out. The out-breath has the starting point inside the abdomen, then it runs through the middle of the chest, and finally it terminates at the nose-tip.

Some people are able to observe only at the middle point and not at the other two points; it is harder for them to develop a sensitivity for the starting and the terminal points. Some people are able to observe only at the terminal point and not at the other two points. For them it is harder to develop a sensitivity for the starting and the middle points. On the other hand, some people are sensitive to all three points and all appear clearly. One who observes and is able to feel the air as it contacts at all three points is said to have accomplished this third step.

Step 4. One trains oneself to calm the breathing process, as one breathes in and out. In this step, one controls rough breathing to become subtle breathing until one is completely absorbed in appana-samadhi or deep absorption or Jhana, which is the highest level for mind development in the stage of recollection of the body (kayanupassana). It is certainly not easy for one to develop the mind to reach this state. During the process of mind development, in this stage the meditator will experience various strange happenings that occur to the mind.

DEEP BREATHING EXERCISE

Deep breathing exercises have been used for years as a way of relaxing the body. Anyone who has ever noticed how an infant's abdomen rises and falls with each breath has experienced the art of proper deep breathing. Most adults today tend to fill only the upper chest when they breathe and thus miss how the increased oxygen intake relieves tension and improves metal alertness. By employing some of the more popular deep breathing exercises listed below you can strengthen the lungs, relieve bronchitis, improve circulation, oxygenate the blood and minimize the reoccurrence of respiratory ailments.

Another wonderful deep breathing exercise to relieve stress can be done in any location. Sitting straight in a chair, place one hand on your abdomen and breathe in deeply through your nose counting to ten. Hold the breath for a count of five and then release slowly through your mouth to a

count of ten. While you are holding the breath, focus on your abdomen to ensure it is extended as far as you can comfortably extend it. It is good to start with five of these exercises, but even two will have an immediate affect.

BREATHING EXERCISE TO HELP WITH SUDDEN STRESS

When stress hits suddenly, it can be very helpful to perform a short breathing exercise before saying or doing anything in response. Examples of sudden (acute) stresses include the following:

A car abruptly pulling out in front of you while you are driving

Hearing very upsetting, unexpected information, such as being fired or being diagnosed with an illness

A conflict suddenly arising between you and a co-worker, friend or family member

In any of these situations, the body's natural response is to prepare the body for "fight or flight," a primal series of reactions designed to increase heart rate, respiration and sudden, quick body movement. "Fight or flight" does not, however, enhance the brain's ability to fashion a mature, socially and professionally appropriate response to a difficult situation. Therefore, people are encouraged to pause, take a deep breath and think before responding. Ideally, people may take a "time out" away from the situation in order to calm down further (e.g., using one of the other breathing exercises listed below) before identifying and addressing the problem at hand

BREATHING EXERCISES TO DO AT WORK

People tend to breathe very shallowly, working for hours without taking a good, deep, cleansing breath. When people catch themselves sighing or yawning during the day, this may be a sign that the body is trying to take in more oxygen . As people continue to work long hours, eating meals on the run or skipping them altogether, a short breathing exercise in the middle of the day can relieve stress and be emotionally and physically rejuvenating. Afterward, people may be surprised to find themselves getting more work done, with better quality.

Each step of this exercise can be done while sitting . The steps are as follows:

Take a deep breath as you drop your chin toward your chest, touching the chest if possible. Exhale as you gently raise your head slowly to an upright position. Repeat as desired. It may also be helpful to do some "head rolls," in which the head is rolled slowly to the right, to the chest, to the left, and to the chest in a semicircle.

Take a deep breath as you stretch your arms over your head. Hold your breath and the stretch for a few seconds, and then release both slowly.

Take a deep breath as you stretch your arms out in front of you. Hold your breath and the stretch for a few seconds, and then release both slowly. Take a deep breath as you stretch your arms behind you. Hold your breath and the stretch for a few seconds, and then release both slowly.

DEEP BREATHING EXERCISE

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BREATHING EXERCISES TO HELP YOU SLEEP

Thinking about stressful situations before going to sleep can trigger the stress response, which is the exact opposite of what the body requires in order to go to sleep. A breathing exercise can help people turn their attention from their racing thoughts to their hard-working body's need for sleep.

Each step of this exercise can be done while lying in bed. The steps are as follows:

Close your eyes and take three deep, cleansing breaths. Focus on inhaling clean air and exhaling stale air.

Continuing to breathe deeply, spend a few moments focusing your attention on your toes. You will have fully focused your attention on this part of your body when you can mentally visualize the position of each toe. This, in itself, can be quite relaxing as attention shifts from the mind to the body.

Breathe fresh air into the toes, fingertips, scalp and every other part of the body. Exhale stale air from all of those locations, feeling warm and

If attention wanders, go back to the second step, re-focusing on the toes before beginning the process again. If necessary, keep your attention on the toes, skipping the third step of the exercise entirely. Different strategies will be more helpful for different people. It may take some time to find a strategy that works best for you.

Notice: Next time we shall complete other important modalities in this very important subject of sport psychology.

The Nine Mental Skills of Successful Athletes

Dr. Abdulmonem ZARKA
Sports Medicine Physician

What athletes have in common is that their sport is important to them and they're committed to being the best that they can be within the scope of their limitations – other life commitments, finances, time, and their natural ability. They set high, realistic goals for themselves and train and play hard. They are successful because they are pursuing their goals and enjoying their sport. Their sport participation enriches their lives and they believe that what they get back is worth what they put into their sport.

There are nine, specific mental skills that contribute to success in sports. They are all learned and can be improved with instruction and practice.

The same mental skills that athletes use in achieving success in sports can be used to achieve success in other areas of their lives.

Successful Athletes:

1. Choose and maintain a positive attitude.
2. Maintain a high level of self-motivation.
3. Set high, realistic goals.
4. Deal effectively with people.
5. Use positive self-talk.
6. Use positive mental imagery.
7. Manage anxiety effectively.
8. Manage their emotions effectively.
9. Maintain concentration.

Mental Skills Training

These nine mental skills are necessary for performing well in sport as well as in non-sport performance situations:

• These skills are learned and can be improved through instruction and practice.

• Atbeginning each individual should be assessed for his/her current proficiency in each of the skills.

• There should be teaching and enhancing of the specific skills that need improvement for the individual.

• There should be reassess of the client's proficiency in each of the skills in order to evaluate progress.

The Performance Pyramid

Although each of the nine skills is important, its primary importance will occur during one of three phases: long-term development, immediate preparation for performance, and during performance itself.

Level I - These mental skills constitute a broad base for attaining long-term goals, learning, and sustaining daily practice. They are needed on a day-by-day basis for long periods of time, often months and years.

Level II - These skills are used immediately before performance to prepare for performance. They may be used just before competition begins, or immediately before a specific performance action, such as a golf shot or a free throw in basketball.

Level III - These skills are used during actual performance behavior.

The pyramid below represents the relationship of the nine skills to one another. Each of the higher levels incorporates and is based upon the skills of the preceding levels.

1. Attitude

Successful athletes:

• Realize that attitude is a choice.

• Choose an attitude that is predominately positive.

• View their sport as an opportunity to compete against themselves and learn from their successes and failures.

• Pursue excellence, not perfection, and realize that they, as well as their coaches, teammates, officials, and others are not perfect.

• Maintain balance and perspective between their sport and the rest of their lives.

• Respect their sport, other participants, coaches, officials, and themselves.

2. Motivation

Successful athletes:

• Are aware of the rewards and benefits that they expect to experience through their sports participation.

• Are able to persist through difficult tasks and difficult times, even when these rewards and benefits are not immediately forthcoming.

• Realize that many of the benefits come from their participation, not the outcome.

3. Goals and Commitment

Successful athletes:

• Set long-term and short-term goals that are realistic, measurable, and time-oriented.

• Are aware of their current performance levels and are able to develop specific, detailed plans for attaining their goals.

• Are highly committed to their goals and to carrying out the daily demands of their training programs.

4. People Skills

Successful athletes:

• Realize that they are part of a larger system that includes their families, friends, teammates, coaches, and others.

• When appropriate, communicate their thoughts, feelings, and needs to these people and listen to them as well.

• Have learned effective skills for dealing with conflict, difficult opponents, and other people when they are negative or oppositional.

5. Self-Talk

Successful athletes:

• Maintain their self-confidence during difficult times with realistic, positive self-talk.

• Talk to themselves the way they would talk to their own best friend

• Use self-talk to regulate thoughts, feelings and behaviors during competition.

6. Mental Imagery

Successful athletes:

• Prepare themselves for competition by imagining themselves performing well in competition.

• Create and use mental images that are detailed, specific, and realistic.

• Use imagery during competition to prepare for action and recover from errors and poor performances.

7. Dealing Effectively with Anxiety

Successful athletes:

• Accept anxiety as part of sport.

• Realize that some degree of anxiety can help them perform well.

• Know how to reduce anxiety when it becomes too strong, without losing their intensity.

8. Dealing Effectively with Emotions

Successful athletes:

• Accept strong emotions such as excitement, anger, and disappointment as part of the sport experience.

• Are able to use these emotions to improve, rather than interfere with high level performance

9. Concentration

Successful athletes:

• Know what they must pay attention to during each game or sport situation.

• Have learned how to maintain focus and resist distractions, whether they come from the environment or from within themselves.

• Are able to regain their focus when concentration is lost during competition.

• Have learned how to play in the "here-and-now", without regard to either past or anticipated future events.

IMPORTANT FACTORS IN RELATION TO SPORTS INJURIES

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M . D . Orthopaedic Surgery
C . E . S . Medicine du Sport
Deploma Universitaire Traumatologie du Sport
(M . D .) Toulose - France

For every sport_ a number of factors of varying degrees of importance must be considered in relation to injury. _

1. The athlete's qualifications

2. Sports equipment and facilities

3. Characteristics of sports

1.The athlete's qualifications

1. Age.

2. Personal characteristics.

3. Experience.

4. Level of training.

5. Technique.

6. An insufficient warm – up period. _

7. Intensive competition and training programmes.

8. Health problems.

9. A balanced and nutritious diet.

10. General measures.

1.The athlete's qualifications

• Age affects the strength and resilience of the tissues. Muscular strength begins to decline at the relatively early age of thirty to forty years_ while elasticity in tendons and ligaments decreases from the age of thirty and the strength of bone after the age of fifty.

Inactivity accelerates the natural degeneration of muscles_ tendons ligaments_ articular surfaces and bone structure _ while activity tends to delay it.

Physical achievement reaches its peak between the ages of twenty and forty _ unlike intellectual ability which is at its best between thirty and sixty years of age.

• Personal characteristics such as temperament and maturity may affect the athlete's tendency to take or to avoid risks.

• Experience is important. Beginners often suffer more injuries than experienced athletes.

• Level of training is significant since injuries occur often at the beginning of the season and towards the end of matches

and are caused by inadequate basic physical fitness.

Too much training - on the other hand - may cause injuries as a result of overuse.

• Technique is of the greatest importance to any taking part in such sports as high jump_ javelin throwing and tennis. Faulty technique can contribute to overuse syndromes and cause traumatic injuries_ for example_ in Alpine skiing.

• An insufficient warm – up period may contribute to muscle and tendon injuries.

• Intensive competition and training programmes which do not allow a sufficient recovery period after maximum effort increase the risk of injury

• Health problems (for example - infection and flu – like illnesses) increase the risk of complications such as inflammation of cardiac muscle. No athlete should participate in training or competition until his tempera ture has returned to normal after an illness.

• A balanced and nutritious diet_ including adequate fluids - is a prerequisite for sporting activities.

• General measures - including sufficient rest and sleep and avoiding alcohol reduce the risk of injury.

2.Sports equipment and facilities

1. Equipment.

2. Protective clothing.

3. Sports facilities.

4. Lighting.

5. Unsuitable weather conditions.

2.Sports equipment and facilities

• Equipment used in any sport may be inadequate poorly designed and / or defective.

• Protective clothing can be faulty insufficient or even discarded.

• Sports facilities are not always suitable for the activities for which they are used.

• Lighting of the sports area may the judgement of distances_ the perception of colours and the athlete's visual acuity.

• Unsuitable weather conditions increase the risk of injury.

3.Characteristics of sports

• Different sports make different demands on the athlete. Competitive sport perthaps involves an increased risk of injury but some people have a positive need to participate at the level and gain great satisfaction from doing so Top athletes often help up as example to the young who are encouraged to attend sports ground and running tracks as a result.

• Also top level sport arouses great public interest and plays an important part in the everyday life of many people_ so is not to be discouraged.

Regardless of the level at which it is played each sport is unique in terms of the demands it places on participants and its special characteristics which can cause both overuse and traumatic injures.

SPORTS MEDICINE – A DEFINITION

Dr. Mohammed Iraqui Hassan
M . D . Orthopaedic Surgery
C . E . S . Medicine du Sport
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(M . D .) Toulose - France

• Sports medicine encompasses the following elements: preparation and training prevention of injuries and illness_ diagnosis and treatment of injuries and illness_ and rehabilitation and return to active participation in sports. This definition relates_ to the athlete_ the sport_ sporting equipment and diagnostic instrumentation.

SPORTS MEDICINE – A DEFINITION

1. Preparation and training.
2. Prevention of injury and illness.
3. Diagnosis and treatment of injury and illness.
4. Rehabilitation and return to sporting activities.

1. Preparation and training

• Preparation and training includes instruction in training methods_ technique_ dietary requirements_ the negative effects of drugs and alcohol_ and psychological preparation for competition.

A. Training methods.
B. Technique.
C. Diet.
D. Drugs and alcohol.
E. Psychological preparation.

A. Training methods

• A good_ general conditioning achieved through_ for example interval and endurance training programmes_ is the basis of all sporting activities_ though there are many other factors involved in creating a good athlete. Strength training includes isometric exercise and different types of dynamic training.

• A good example of an effective dynamic strength training method which has been developed in recent years is isokinetic strength training in which muscles are made to work against accomodating resistance. Increased flexibility can be achieved by stretching exercises are essential for all sport – specific training and aim to aim to improve skill in each sport.

B. Technique

• Technique is improving constantly in most sports. As sports becomes more demanding_ correct techniques are crucial if inadvertent overuse injury is to be avoided.

C. Diet

• Physiologists have described how important it is for the athlete to follow a balanced diet before and after training ses-

sions and competitions and to compensate for fluid loss during and after exercise. It is surprising how many athletes are unaware of these facts. It is important to maintain a well – balanced diet before_ during and after practice and competition.

D. Drugs and alcohol

• Taking drugs to improve performance is nothing short of cheating and can increase the risk of injury. All forms of drug-taking in connection with sport are to be deplored.

• Alcohol has deleterious effects upon performance for up to 48 hours after consumption, which again increase the risk of injury and tends to cancel out the beneficial effects of training. Sports and alcohol should not be combined.

• Tobacco, too, has a detrimental effect on performance in addition to its other harmful side-effects.

E. Psychological preparation

• Performance is in many ways dependent upon psychological preparation, and a wall-balanced and motivated athlete will usually perform well even though Psychological effects may be difficult to evaluate scientifically.

2. Prevention of injury and illness

• The prevention of illness and injury in sport depends_ at least in part on appropriate clothing (including protective clothing)_ equipment_ rules_ facilities and health controls.

• Clothing.

• Protective clothing.

• Equipment and rules.

• Sports facilities.

• Routine medical examinations.

A. Clothing

• In many sports, shoes or boots are the most important items of clothing. They should be designed to meet the demands made on the foot by each particular sport; today's market offers plenty of choice for all types of sporting activity. Joggers, for example, require shoes which give adequate support and a sole thick enough to provide shock absorption on hard running surfaces,

• Whereas those involved in court games such as squash require shoes which provide them with a closer contact with the court surface.

• In Alpine skiing, the design of boots, bindings and skis has improved significantly to decrease the incidence of injury, but has resulted in a changed injury panorama.

B. Protective clothing

• Specialized protective clothing has been developed for many sports such as fencing, ice hockey, cricket, baseball, American football and riding. Pioneers in sports medicine have made efforts not only to ensure that such protective clothing (equipment) achieves the required standards but also to ensure that it is used.

C. Equipment and rules

• Equipment used in sport can itself cause injury, particularly if it is used incorrectly. Both equipment and the rules of the

game should be amended if they are in any way likely to contribute towards causing injury. .

D. Sports facilities

• At one time only technology and economics were considered when sports facilities were built – medical expertise was not consulted. Now times are changing and the authorities have realized, for instance, that surfaces and turfs should be designed and constructed to take account of the demands to be made upon them by different sporting activities.

E. Routine medical examinations

• Routine medical examination can never entirely eliminate the possibility of cardiovascular disease, but they can be useful in revealing hidden infection and areas weakened by old injuries. They are probably most useful when they are carried out on a selective basis according to the particular sport in question.

• Examinations before competition and at the beginning of the season are important because they highlight the athlete's risk areas and help the trainer to design specific training programmes. In most sports, an evaluation of the musculoskeletal system is of special value.

3. Diagnosis and treatment of injury and illness

• Serious acute injuries are generally treated adequately in hospital and it is the sub-acute and chronic injuries which present more of problem to the coach or trainer in sport. Meniscal and overuse injuries, including inflammation of periosteum, tendons and bursae, are often difficult to diagnose and treat and are not always well understood.

4. Rehabilitation and return to sporting

activities

• Injuries heal at varying paces depending on their severity and location. If rehabilitation is to be complete, it is essential that whoever is treating the injury should have a thorough knowledge of the healing process in different tissues and should also be thoroughly familiar with the demands of the sport concerned.

• Then the various element of the rehabilitation programme can be introduced appropriately to ensure a successful return to active soprt.

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D. Drugs and alcohol

• Taking drugs to improve performance is nothing short of cheating and can increase the risk of injury. All forms of drug-taking in connection with sport are to be deplored.

• Alcohol has deleterious effects upon performance for up to 48 hours after consumption, which again increase the risk of injury and tends to cancel out the beneficial effects of training. Sports and alcohol should not be combined.

• Tobacco, too, has a detrimental effect on performance in addition to its other harmful side-effects.

E. Psychological preparation

• Performance is in many ways dependent upon psychological preparation, and a wall-balanced and motivated athlete will usually perform well even though Psychological effects may be difficult to evaluate scientifically.

2. Prevention of injury and illness

• The prevention of illness and injury in sport depends_ at least in part on appropriate clothing (including protective clothing)_ equipment_ rules_ facilities and health controls.

• Clothing.

• Protective clothing.

• Equipment and rules.

• Sports facilities.

• Routine medical examinations.

A. Clothing

• In many sports, shoes or boots are the most important items of clothing. They should be designed to meet the demands made on the foot by each particular sport; today's market offers plenty of choice for

all types of sporting activity. Joggers, for example, require shoes which give adequate support and a sole thick enough to provide shock absorption on hard running surfaces,

• Whereas those involved in court games such as squash require shoes which provide them with a closer contact with the court surface.

• In Alpine skiing, the design of boots, bindings and skis has improved significantly to decrease the incidence of injury, but has resulted in a changed injury panorama.

B. Protective clothing

• Specialized protective clothing has been developed for many sports such as fencing, ice hockey, cricket, baseball, American football and riding. Pioneers in sports medicine have made efforts not only to ensure that such protective clothing (equipment) achieves the required standards but also to ensure that it is used.

C. Equipment and rules

• Equipment used in sport can itself cause injury, particularly if it is used incorrectly. Both equipment and the rules of the game should be amended if they are in any way likely to contribute towards causing injury. .

D. Sports facilities

• At one time only technology and economics were considered when sports facilities were built – medical expertise was not consulted. Now times are changing and the authorities have realized, for instance, that surfaces and turfs should be designed and constructed to take account of the demands to be made upon them by different sporting activities.

E. Routine medical examinations

• Routine medical examination can never entirely eliminate the possibility of cardiovascular disease, but they can be useful in revealing hidden infection and areas weakened by old injuries. They are probably most useful when they are carried out on a selective basis according to the particular sport in question.

• Examinations before competition and at the beginning of the season are important because they highlight the athlete's risk areas and help the trainer to design specific training programmes. In most sports, an evaluation of the musculoskeletal system is of special value.

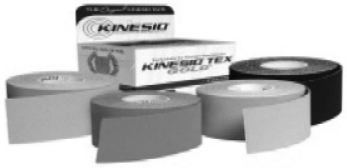
3. Diagnosis and treatment of injury and illness

• Serious acute injuries are generally treated adequately in hospital and it is the sub-acute and chronic injuries which present more of problem to the coach or trainer in sport. Meniscal and overuse injuries, including inflammation of periosteum, tendons and bursae, are often difficult to diagnose and treat and are not always well understood.

4. Rehabilitation and return to sporting activities

• Injuries heal at varying paces depending on their severity and location. If rehabilitation is to be complete, it is essential that whoever is treating the injury should have a thorough knowledge of the healing process in different tissues and should also be thoroughly familiar with the demands of the sport concerned.

• Then the various element of the rehabilitation programme can be introduced appropriately to ensure a successful return to active soprt.



What is the Kinesio Taping Method?

Dr. Gamal Diaa Aldeen Shaheen

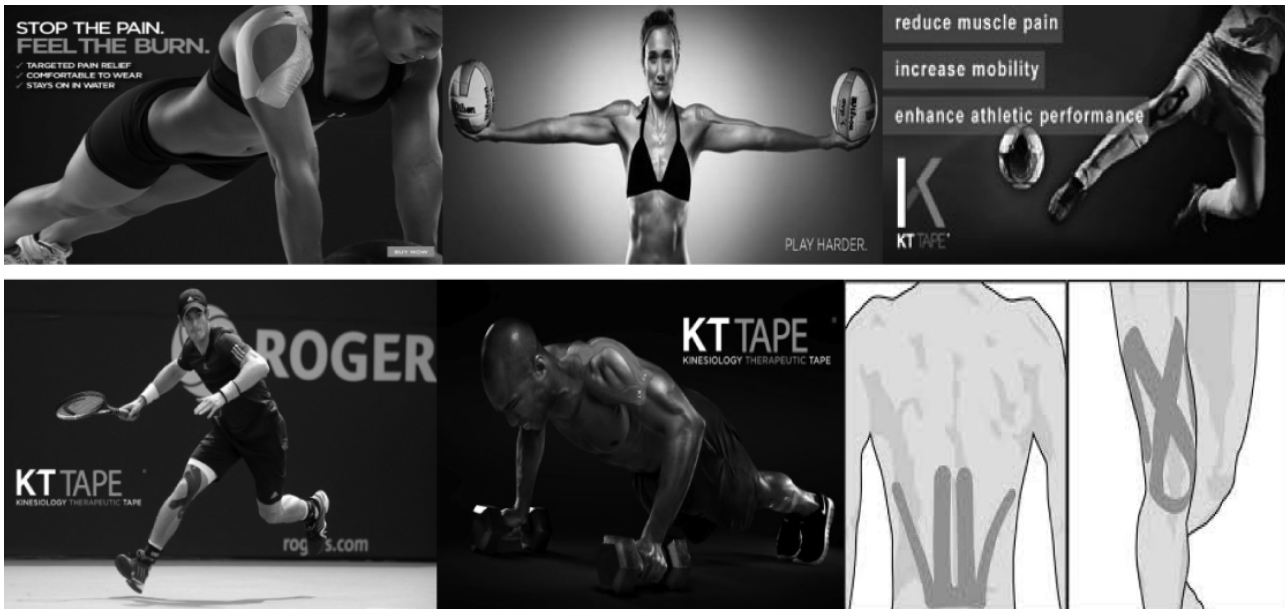
Consultant Physiotherapy & sport medicine
Sport medicine specialized centre

The Kinesio Taping Methodis a definitive rehabilitative taping technique that is designed to facilitate the body's natural healing process while providing support and stability to muscles and joints without restricting the body's range of motion as well as providing extended soft tissue manipulation to prolong the benefits of manual therapy administered within the clinical setting. Latex-free and wearable for days at a time, Kinesio Tape is safe for populations ranging from pediatric to geriatric, and successfully treats a variety of orthopedic, neuromuscular, neurological and other medical conditions. The Kinesio Taping Method is a therapeutic taping technique not only offering your patient the support they are looking for, but also rehabilitating the affected condition as well. By targeting different receptors within the somato-sensory system, and alleviates pain and facilitates lymphatic drainage by microscopically lifting the skin. This lifting affect forms convolutions in the skin thus increasing interstitial space and allowing for a decrease in inflammation of the affected areas.

Based upon years of clinical use, Kinesio® Tex Tape is specifically applied to the patient based upon their needs after evaluation. The findings of the clinical evaluation or assessment dictate the specifics of the Kinesio® Tex Tape application and other possible treatments or modalities. With the utilization of single "I" strips or modifications in the shape of an "X", "Y" or other specialized shapes as well as the direction and amount of stretch placed on the tape at time of application, Kinesio® Tex Tape can be applied in hundreds of ways and has the ability to re-educate the neuromuscular system, reduce pain and inflammation, optimize performance, prevent injury and promote good circulation and healing, and assist in returning the body to homeostasis.

The Kinesio Taping Method is felt to cause physiological effects on several body systems. The systems affected by the body are thought to include the circulatory , lymphatic, neural, muscular, and fascial systems, as well as the joints. Kinesio Taping is currently being used by therapists to change muscle tone, move lymphatic fluids, correct movement patterns, and improve posture. The Kinesio Taping Method is a unique method of applying Kinesio Tex Tape in a specific manner to create change in the aforementioned systems. Benefits of using the tape are that it is more economical over time than other modalities, it is easy to learn and apply, there are less types of tape, and it may be used over a longer period of time.

The KinesioBenefit:Evaluation and assessment are key in the treatment of any clinical condition. In order to get the desired results from a Kinesio Tex Tape application as well as any other treatment, a full assessment of your patient is necessary. In some cases, the treatment of a condition may require treatment of other underlying conditions as well. This assessment should include manual muscle testing, range of motion testing, gait assessment, and any other orthopedic special tests that you deem necessary. The information gained from these assessments will allow for the proper treatment protocol to be laid out. Kinesio Tex Tape can be a valuable addition to this protocol. It has been proven to have positive physiological effects on the skin, lymphatic and circulatory system, fascia, muscles, ligaments, tendons, and joints. It can be used in conjunction with a multitude of other treatments and modalities within your clinic and is effective during the rehabilitative and chronic phases on an injury as well as being used for preventative meas-



ures.Kinesio Tex Tape was created and developed by Dr. KenzoKase in 1973. It is a treatment that is felt to prolong the effects of physiologic work done. After many unsuccessful attempts to use adhesive tapes that were commercially available, Dr. Kase developed Kinesio Tex Tape.

The kinesio tape method differs from athletic strapping tape and the traditional McConnell Taping Method. Athletic strapping tape is used mostly to limit ranges of motion and to constrict muscle movement. The effect of this method is to create a bridge over the areas that are injured so that athletes can perform sport movements and have either prophylactic support or support to an injured part of the body. Athletic tape is typically removed after the end of an athletic event.The McConnell Taping Method is a technique that tapes body parts to affect a specific biomechanical movement. McConnell Tape uses a very rigid, highly adhesive tape that is applied for no more that 18 hours and often for shorter periods of time due to patient discomfort.

What is Kinesio Tex Tape?Kinesio Tex Tape is a newly popularized modality that is used by therapists trained in the Kinesio Taping Method by Certified KinesioTaping Instructors (CKTI). Kinesio Tex Tape is a latex-free hypoallergenic cotton fiber tape with an acrylic heat-activated backing that stretches only along its longitudinal axis. The tape can be stretched 40%-60% of its resting length. The tape has no medicinal properties. The thickness and weight of the tape is designed to approximate the weight and thickness of skin.

The product is a type of thin, elastic cotton tape that can stretch up to 140% of its original length.[2] As a result, if the tape is applied stretched greater than its normal length, it will "recoil" after being applied and therefore create a pulling force on the skin. This elastic property allows much greater range of motion compared to traditional white athletic tape and can also be left on for long periods of time before reapplication.[3]

Designed to mimic human skin, with roughly the same thickness and elastic properties, the tape can be stretched 30–40% in the longitudinal direction. [2] It is a latex free material with acrylic adhesive, which is heat activated. The cotton fibers allow for evaporation and quicker drying leading to longer wear time, up to 4 days.[4] How the tape is claimed to affect the body is dependent on its usage throughout the body and how it is applied: the direction of pull, the shape, and the location; all play a role in its hypothetical function.[4]

There are several theoretical benefits claimed for the tape. One of those is correcting the alignment of

weak muscles as well as facilitating joint motion as a result of the tape's recoiling qualities. Additionally, the tape is claimed to lift the skin, increasing the space below it, and increasing blood flow and circulation of lymphatic fluids (swelling). This increase in the interstitial space is said to lead to less pressure on the body's nociceptors, which detect pain, and to stimulate mechanoreceptors, to improve overall joint proprioception.

Effectivness :A 2015 meta analysis found that the taping provided more pain relief than no treatment at all, but was not better than other treatment approaches in patients with chronic musculoskeletal pain. The same meta analysis did not find any significant changes in disability as a result of taping. A 2012 journal article from the Journal of Hand Therapysuggests that kinesio tape might have some effect on lymph drainage. Based on a double blind study, elastic therapeutic tape may be of some assistance to clinicians in improving pain-free active range of motion immediately after tape application for patients with shoulder pain. Utilization of the tape for decreasing pain intensity or disability for young patients with suspected shoulder tendonitis/ impingement is not supported. Based on two different studies, kinesio tape showed quicker drainage than manually and better patient compliance. A 2014 meta analysis looked at methodological quality of studies along with overall population effect and suggested that studies deemed of lower methodological quality are more likely to report beneficial effects of elastic therapeutic taping. It also suggested that applying elastic therapeutic tape, "to facilitate muscular contraction has no or only negligible effects on muscle strength". A 2012 meta analysis found that the efficacy of elastic therapeutic tape in pain relief was trivial given that no studies found clinically important results. The tape "may have a small beneficial role in improving strength, range of motion in certain injured cohorts and force sense error compared with other elastic tapes, but further studies are needed to confirm these findings". The same article concluded: "KT had some substantial effects on muscle activity, but it was unclear whether these changes were beneficial or harmful. In conclusion, there was little quality evidence to support the use of KT over other types of elastic taping in the management or prevention of sports injuries".Some researchers claim that what athletes are experiencing is a placebo effect.

Application :The tape is applied to skin, with the intent to stabilize and support muscles, ligaments, tendons, and joints as whole. Applications can also focus on fascia, the superficial lymphatic system, capillary system and nervous system. The type of cut, the amount of stretch, and placement of the tape on the body will vary based on the type of tissues being treated.

The tape is applied with the affected muscle in a stretched position, taping from the origin of the muscle to the insertion point. Once applied, it is rubbed to activate the pressure-sensitive adhesive.

Application is in three general shapes or techniques. An "I" shape is used for small or linear places, for ex. an I-shaped piece of tape will be applied to the teres minor or rhomboid minor. A "Y" shape is used for larger muscles, like the deltoid. The "X" shape is used for large and long muscles, such as the biceps femoris.

Attention please

I Hope that any new edition of our bulletin will include one important research which has been puplished in the most famous and respected magazines and newspapers of sport medicine. President of the bulletin

Research article

Resistance Training using Low Cost Elastic Tubing is Equally Effective to Conventional Weight Machines in Middle-Aged to Older Healthy Adults: A Quasi-Randomized Controlled Clinical Trial

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ABSTRACT

The objectives of the study were to compare the effects of resistance training using either a low cost and portable elastic tubing or conventional weight machines on muscle force, functional exercise capacity, and health-related quality of life (HRQOL) in middle-aged to older healthy adults. In this clinical trial twenty-nine middle-aged to older healthy adults were randomly assigned to one of the three groups a priori defined: resistance training with elastic tubing (ETG; n = 10), conventional resistance training (weight machines) (CTG; n = 9) and control group (CG, n = 10). Both ETG and CTG followed a 12-week resistance training (3x/week - upper and lower limbs). Muscle force, functional exercise capacity and HRQOL were evaluated at baseline, 6 and 12 weeks. CG underwent the three evaluations with no formal intervention or activity counseling provided. ETG and CTG increased similarly and significantly muscle force (_16-44% in ETG and _25-46% in CTG, $p < 0.05$ for both), functional exercise capacity (ETG _4 ± 4% and CTG _6±8%; $p < 0.05$ for both). Improvement on "pain" domain of HRQOL could only be observed in the CTG (_21 ± 26% $p = 0.037$). CG showed no statistical improvement in any of the variables investigated. Resistance training using elastic tubing (a low cost and portable tool) and conventional resistance training using weight machines promoted similar positive effects on peripheral muscle force and functional exercise capacity in middle-aged to older healthy adults.

Key words: Exercise, muscle strength, functional exercise capacity

Key Points

- There is compeling evidence linking resistance training to health.
- Elastic resistance training improves the functionality of middle-aged to older healthy adults.
- Elastic resistance training was shown to be as effective as conventional resistence training in middle-aged to older healthy adults.

INTRODUCTION

There is compeling evidence linking resistance training (RT) to health. Benefits span across a broad range of outcomes with primary effects observed on muscle force and power (American College of Sports, 2009; Geirsdottir et al., 2012). Secondary effects are observed on metabolic control (e.gcontroling the risk factors related to metabolic syndromes, increase sensitivity to insulin and glucose tolerance (Hotamisligil, 2006)), improved systemic inflammatory response (Calle and Fernandez, 2010), and increased functional exercise capacity with consequent improvement in health-related quality of life (American College of Sports, 2009; Geirsdottir et al.,2012).

The American College of Sports Medicine recommends RT with a frequency of 2-3 days/week with intensities of 60-70% of one repetition maximum (RM) for 8-12 repetitions to maximize muscular strength (American College of Sports, 2009). Commonly, RT is delivered using dumbbells, barbells and weight machines. The elevated costs associated with the large space requirements of such equipments limit its availability (Ramos et al., 2014).

In the last few years, modalities have been proposed as alternative to deliver RT. The use of elas-

tic resistance (ER) is a method that uses elastic bands / tubes as resistive load (American College of Sports Medicine, 2011; Ramos et al., 2014; Simoneau et al., 2001). Muscle activation measured by electromyography was found similar to both upper and lower limbs during isotonic contractions with the advantage of permiting greater range of motion compared to weight machines (American College of Sports Medicine, 2011; Andersen et al., 2010; Brandt et al.,2013). Aboodarda et al. (2016) performed a meta-analysis of 18 articles with 35 different measures of activation and observed that ER provides similar prime mover, antagonist, stabilizer and assistant movers activation as isoinertial resistance. There is also the advantage to use it in places with limited space including home environment, since the equipaments used on elastic resistance are relatively inexpensive and more portable than weight machines.

Likewise conventional RT, benefits of elastic resistance training are observed on muscle force and exercise capacity in healthy older adults and individuals with different diseases (Martins et al.,2013; Mikesky et al., 1994; Motalebi and Loke, 2014; Ramos et al., 2014; Singnoy et al., 2017; Turban et al., 2014). Behm (1991) conducted the first randomized trial comparing elastic resistance to traditional machine and hydraulic resistance machine during a 10-week training program in young women and concluded that the three training methods were equally effective in promoting strength gains. Similarly, Colado et al. (2010) compared the resistance training using Thera-Band® elastic tubes with conventional resistance training in young women and described comparable gains in isometric force in both groups. In middle-aged sedentary women, Colado and Triplett (2008) compared elastic resistance training to conventional RT and found similar benefits in functional exercise capacity and body composition in both groups. Furthermore, Webber and Porter (2010) observed similar improvement in strength and muscle power between ER and conventional RT in mobility-impaired older women.

Therefore, although literature seems decisive about the benefits of ER, the comparability of a resistance training protocol using elastic tubing to conventional resistance training in middle-aged to older healthy adults including men and women, remains to be investigated.

This study compared the effects of resistance training using elastic tubing to conventional resistance training using weight machines on muscle force, functional exercise capacity, and health-related life quality. We hypothesized that RT using elastic tubing promotes similar positive effects to those found in conventional RT in middle-aged to older healthy adults.

METHODS

Participants

In this quasi-randomized controlled trial, middle-aged to older healthy adults (mean age 58 years) were included between March and December 2015. The study was conducted in a university-based, outpatient, physical therapy clinic. Subjects were considered eligible if were older than 45 years old without any underlying cardiac, musculoskeletal or pulmonary disease and were not engaged in regular physical activity program during the last 6 months. Individuals would be excluded if they had low adherence to training (less than 75% of all sessions). All procedures were approved by the Research Ethics Committee (CAAE: 16606213.4.0000.5402) and followed the resolution #466/12 of the National Health Council, Brazil. Written informed consent was obtained from all patients. This study was registered in the Brazilian clinical trials registration (#RBR-4tswsq).

Study design

Subjects included in the study followed an initial assessment including medical consultation (including physical fitness test: cardiopulmonary exercise test), identification and assessment of medical history, anthropometric measurements and vital signs, physical activity levels (International Physical Activity Questionnaire - IPAQ questionnaire) (Pardini et al., 2001), health-related quality of life (Medical Outcomes Study 36-Item Short Form Health Survey, SF-36) (Ciconelli et al., 1999), functional exercise capacity (six minute walk test, 6MWT) (Holland et al.,2014), muscle force of upper limbs (UL) and lower (LL) (dynamometry) (Ramos et al., 2014).

After the initial assessment, subjects were allocated into one of three a priori defined groups (ETG = elastic tubing group; CG = control group;

CTG = conventional training group). Allocation of the first three individuals occurred via sealed opaque envelopes. All subsequent subjects included in the study were allocated following the sequence of these three individuals (quasi-randomization, sequence: ETG, CG, CTG) (Figure 1).

Individuals in the control group did not receive physical training or formal activity counseling, but were instructed to mantain their daily activities. Patients in ETG and CTG groups performed resistance exercise training for 12 weeks (3x/week) with recuperative intervals of 48 to 72 hours between sessions. After six and 12 weeks of training, patients had their muscle force, functional exercise capacity and health-related quality of life reassessed. Details on muscle force measurements, load progression during the sessions and composition of exercise programs are described below.

Evaluation of muscle force and load increment over the sessions

The measurement of muscle force was performed using a digital dynamometer (Force Gauge®, model FG-100kg, USA) in the dominant UL and LL and the results were expressed in Newtons (N) (Ramos et al., 2014). Tested muscle groups were knee extensors, knee flexors, shoulder flexors, shoulder abductors and elbow flexors. Recent data confirms validity and reliability of the elastic resistance for muscle testing. (Andersen et al., 2017)

The criterion to increase workload was based on the number-of-repetitions test (NR) performed at the beginning of each session. Participants performed the NR to verify the maximum number of repetitions they could perform with a given load. The load would be maintained for that session when the maximum number of repetitions performed was 15 ± 2, it would be otherwise adjusted to achieve the expected number of repetitions. The increment in the ETG was done by changing the diameter of the tubes and/or adding extra tubes. Increases in the workload for subjects in CTG followed the same criterion of ETG with changes in the weights of the machine.

Training programs offered at ETG and CTG

The duration of each exercise session varied between 40 and 60 minutes and included the resistance training as well as global stretching exercises and the verification of vital signs. Prior to the start of the training, participants were familiarized with the exercises, equipment and elastic tubing. The movements were performed in the following order: shoulder abduction, elbow flexion, shoulders flexion, knee extension and knee flexion. Exercises were conducted under a periodized and progressive design starting with 2x15 NR (weeks 1 – 3), 3x15 NR (weeks 4 – 6), 3x10 NR (weeks 7 – 9) and finally 4x6 NR (weeks 10 – 12) with 2-minute interval between sets. More details of the adopted training protocols can be found in the literature (Silva et al., 2016).

Resistance training with elastic tubing

Five models of elastic tubing were used (#200, #201, #202, #203 and #204) (Lemgruber, Brazil). The estimated cost of the elastic tubing per patient is US$20. Higher numbers indicate larger tube diameters. Tubes #200 (internal/external diameter: 3.0/5.5mm), #201 (internal/external diameter: 4.0/5.5mm), #202 (internal/external diameter:4.0/8.0mm) and #203 (internal/external diameter: 6.0/9.0mm) were used for the upper limbs training. Tubes #203 and #204 (internal/external diameter: 6.0/11.5mm) were used for lower limbs training. All tubes were connected to a specific chair with length and position adjusted for each trained muscle group. Trained muscle groups were the same as evaluated during the assessments (i.e. knee flexors and extensors, shoulder flexors and abductors and elbow flexors). An example of the training execution using elastic tubes can be seen in Figure 2.

Conventional resistance training

Participants allocated to the CTG used a weight machine (Ipiranga®, Brazil) (Figure 3). A simple pulley equipment was used for the upper limb training. One-legged open chain knee extension/flexion exercises were conducted on a sated position.

Statistical analysis

Data analysis was conducted using SPSS v.22 (SPSS Inc., Chicago, USA) by a researcher (IBT) blinded for the subjects' allocation and training progression. Normality of data was checked using Shapiro-Wilk test. Results are reported as mean±standard deviation or median [interquartile range] according to the data distribution. We per-

formed a priori the sample calculation based on previous study (Locks et al., 2012). To achieve an improvement of 51 m in the 6MWD (for the conventional and elastic tubing training modalities) with a standard deviation of 63 m it was necessary to include 9 subjects in each group. Considering 10% of sample loss the calculation was adjusted to 10 individuals each group to obtain 80% of power with a statistical significance of 5% (Z= 1.96). Categorical data was presented as frequency and compared using the chi-square test. One-way ANOVA or Kruskal-Wallis test for repeated measures was used to compare intra-group differences between baseline, 6 and 12 weeks. Two-way ANOVA was used to compare changes between 3 groups across 3 testing times. Magnitude of differences between group responses was also describe as effect size using Cohen's d. The effect size classes were defined according to calculated values d [small ($d \leq 0.2$), moderate ($d = 0.5$) or large ($d \geq 0.8$)] (Cohen,1988). An intension-to-treat analysis was performed for variables with missing data in the final evaluation by the last observation carried forward (Elkins and Moseley, 2015).

RESULTS

Characteristics of the subjects included in the study are shown in Table 1. As expected, none of the individuals presented cardiac, respiratory or musculoskeletal disease. All subjects were irregularly active (i.e. subjects performed physical activity but not enough to be classified as active, according to IPAQ) (Matsudo et al., 2002) and no statistically significant difference was observed between the three groups at baseline. Five individuals (ETG, n = 1; CG, n = 2; and CTG, n = 2) had their data of functional exercise capacity, muscle force and health-related quality of life repeated in the final assessment (intention-to-treat analysis) due to discontinued intervention or lost to follow-up.

Changes in muscle force from baseline (Table 2) were observed in ETG and CTG for all the trained muscle groups (T16% to 44% for ETG and o25% to 46% for CTG, $p< 0.05$ for all movements at least one of the groups). No significant differences were observed in the control group. Observed effect size was large for all trained groups in ETG (0.86 to 1.62) and CTG (0.94 to 1.29). Only small to moderate (0.14 to 0.58) effect size was observed between ETG and CTG training responses.

Effects on functional exercise capacity are described in Table 3. Significant improvements from baseline were observed on walked distance in both ETG (_+4.5 ± 4.3%, $p < 0.05$) and CTG (_+6.5 ± 8.1% $p < 0.05$) (Cohen's $d = 0.99$ for both).

Changes on domains of health-related quality of life (Table 4) were only observed in the CTG for "pain" (21 ± 26 points $p = 0.037$). No significant differences between groups were observed for changes in none of the domains of the questionnaire.

DISCUSSION

This study confirms the effects of a conventional resistance training on muscle force and add that a RT program using elastic tubing resistance of equal duration and intensity was able to promote similar effects in irregularly active middle-aged to older healthy adults. The two training regimens also showed similar improvements in functional exercise capacity.

The force curve of elastic tubing is not as simple as a linear increase in force and the differences in load applied may not be that different between ER and conventional RT (Aboodarda et al.,2016). The similar level of exercise resistance between ER and conventional RT support the similarity in gains in the investigated sample in the present study.

Evidence exist on the effects of elastic RT. Colado et al. (2010) found similar increases of isometric muscle force comparing a training program using Thera-Band® elastic tubing to RT with weight machines and free weights in a sample of physically active young women. Effects of training using elastic tubing can be found in studies with single group designs (Lubans et al.,2013) and only partially supervised protocol (Skelton et al., 1995). Using protocol similar to the present study, Ramos et al. (2014) described equal improvements of muscle force between conventional and elastic tubing RT.

Previous studies have found similar benefits when comparing ER and conventional RT with regards to functional exercise capacity and body composition of middle-aged adults (Colado and Triplett, 2008), and in strength and power muscle

of older adults (Webber and Porter, 2010). However, these studies have included only women. Furthermore, the study of Webber and Porter (2010) included women with mobility-impairments. Our results confirm these findings in a sample composed of both men and women and show similar benefits of modalities on functional exercise capacity and health-related quality of life (further than muscle force) in a sample of irregularly active middle-aged to older healthy adults. This has important implications for this population, since it confirms the modality as an equally effective alternative option to the conventional resistance training. These tools are distinguished by their practicality because they require little space and especially the low cost compared to weight machines and even other elastic materials commonly used in clinical practice (Ramos et al., 2014).

Benefits were also observed on functional exercise capacity. As expected, CTG and ETG improved similarly after 12 weeks of training in both absolute values and magnitude of the effect size. However, an intriguing lack of significant differences between these two groups and CG was also observed. The construct of the 6MWT may, at least in part, explain this finding. 6MWT is a timed test with a well-described ceiling effect on populations with better muscle function (as the one in the present study) (Holland et al., 2014). In other words, the higher the baseline covered in the test, the lower the improvement expected on the test after an intervention. Baseline 6MWT in CG group was numerically higher than the other two intervention arms. Although it was expected that no changes would occur in the CG during the 12 weeks of the protocol, the extent of improvements of ETG and CTG were also not expected to surpass the values of CG at 12 weeks due to the already high values at baseline.

Effects of resistance training can also be seen on health-related quality of life specially in older subjects (American College of Sports Medicine, 2013; Damush and Damush, 1999; Vieira et al.,2012). Our sample consisted of irregularly active middle-aged to older healthy adults without any undelying disease. It could, therefore, be anticipated that participants had preserved health-related quality of life upon inclusion (Laguardia et al., 2013). Importantly, to those subjects with somewhat increased complains of pain (in CTG), resistance training was effective to improve symptoms and scores in the health-related quality of life questionnaire.

The findings of the present study must be interpreted under the context of some limitations. We did not control for the exact workload delivered during sessions in the ETG. Although this can be interpreted as a limitation, both initial workload and progression during sessions were based on subjects' tolerance (i.e. by the NR test), guaranteeing comparable training volume for both modalities. Although we performed a sample size calculation prior to the commencing of the study, the sample size is relatively small. In addition, the magnitudes of change for the different outcomes in ETG were similar to those observed in CTG, reinforcing the benefits of the modality. Future studies with larger and more heterogeneous sample of middle-aged to older healthy adults are needed to confirm the effectiveness of elastic resistance training to this group of subjects, mainly in outcomes not investigated yet. It would be interesting to study separating middle-aged of older healthy adults including men and women.

CONCLUSION

In conclusion, resistance training with elastic tubing is a viable alternative to deliver resistance training as it promoted similar positive effects on peripheral muscle force and functional exercise capacity in middle-aged to older healthy adults than conventional resistance training.

ACKNOWLEDGEMENTS

This study was funded by (FAPESP) (#2014/08011-4). The authors have no conflict of interest to declare. The experiments comply with the current laws of the country in which they were performed. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. This study received approval from Human Research Ethics Committee (CAAE: 16606213.4.0000.5402) and all procedures were in compliance with Resolution 466/12 of the Brazilian National Health Board.

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