Doping- och antidopingforskning – En inventering av samhälls- och beteendevetenskaplig forskning och publikationer 2004-2007

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2008

Doping- och antidopingforskning

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FoU-rapport 2008:1

FoU-rapporter

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Förord

Det har gått tre år sedan RF senast publicerade en kartläggning av samhälls- och beteendevetenskaplig forskning inom dopingområdet. Det var den första systematiska sammanställningen i sitt slag och väckte stor uppmärksamhet även internationellt. Nu är det dags igen att summera vad som skett inom forskningsområdet under perioden 2004-2007.

Den här gången är anslaget något bredare. Som bekant är doping inte längre bara en företeelse som angår den organiserade idrotten utan även andra delar av samhället. Detta återspeglas också i forskningen, liksom i föreliggande rapport.

Kunskap är hur som helst en viktig förutsättning för ett effektivt antidopingarbete – oavsett var det bedrivs – och att följa forskningsläget utgör en grund för egna initiativ och utvecklingsprojekt av olika slag. Det är vår förhoppning att föreliggande rapport ska göra det möjligt för fler intressenter inom antidopingområdet att uppdatera sin kunskap inom området och att det i sin tur ska bidra till ett än mer effektivt antidopingarbete – såväl inom idrotten som i samhället i stort, både nationellt och internationellt.

Projektet har finansierats av RF och möjliggjordes genom ett samarbete med institutionen för humanvetenskap vid Högskolan i Kalmar.

Kristina Olinder
Ordförande
Riksidrottsförbundets Dopingkommission

Författarens förord

I föreliggande rapport har författaren kartlagt internationell samhälls- och beteendevetenskaplig dopingforskning, publicerad från 2004 till 2007. Detta är en uppföljning av Riksidrottsförbundets FoU-rapport 2005:1 Doping- och antidopingforskning. Rapporten 2005:1 var en kartläggning av internationell och nordisk doping- och antidopingforskning på de samhälls- och beteendevetenskapliga områdena 1994-2004. Rapportens syfte var, förutom att sammanställa forskningsläget, att analysera antidopingarbetet och forskningen utifrån ett rättssociologiskt perspektiv på regleringen av doping inom idrotten.

Denna uppföljning innehåller, förutom själva kartläggningen, en analyserande diskussion om kunskapsläget utifrån samhällsvetenskapliga perspektiv. Skälet till denna fokusering är att dopingforskningen är mycket begränsad på det samhällsvetenskapliga området. Det faktum att användningen av doping, främst Anabola Androgena Steroider, har börjat bli ett samhällsproblem, talar för att doping bör analyseras i en vidare samhällelig kontext med samhälls- och beteendevetenskapliga metoder.

Samtliga publikationer åren 2004 till 2007 är placerade i appendix med bibliografiska uppgifter och abstract. Appendix är på engelska, men rapporten är skriven på svenska. Skälet till detta är av praktisk art.

Författare till rapporten är David Hoff, vid Högskolan i Kalmar. Undersökningen är finansierad av Riksidrottsförbundets Antidopinggrupp och Högskolan i Kalmar.

David Hoff
Humanvetenskapliga institutionen
Högskolan i Kalmar

Inledning

Detta är en kartläggning av samhälls- och beteendevetenskaplig forskning om doping år 2004 till 2007 (februari).[1] Syftet med undersökningen är att systematisera och tematisera forskningen inom doping- och antidopingområdet, samt att analysera forskningsläget utifrån samhällsvetenskapliga perspektiv. Rapporten har för avsikt att försöka ge helhetsbild av kunskapsläget på dopingområdet. Utvecklingen av dopingforskningen 2004-2007 studeras även i jämförelse med forskningen 1994-2004.

Den forskning som ingår i kartläggningen är i första hand internationella publiceringar i forskningstidskrifter (”peer-review journals”), men även skandinaviska artiklar. Inventeringen har skett via vedertagna informationssökningsinstrument, tillhandahållna av biblioteket vid Högskolan i Kalmar. De viktigaste databaserna har varit ”Social Science Citation Index” och ”ELIN-Kalmar”. Kartläggningen är avgränsad till artiklar på engelska (eller artiklar med engelskt abstract), eller artiklar som är publicerade på något av de skandinaviska språken.

Rapporten går först igenom huvudinriktningarna i forskningen från 1994-2004 för att kunna jämföra dessa med nu aktuella forskningstrender (2004-2007). Därefter redovisas den samhälls- och beteendevetenskapliga forskningen från 2004-2007 i teman vars syfte är att innefatta de mest centrala och tongivande forskningsresultaten: *doping på gym, doping bland ungdomar, doping och idrott samt doping och kosttillskott*. I det avslutande kapitlet diskuteras forskningsresultaten i ett vidare samhällsvetenskapligt sammanhang.

1 Även andra forskningsområden har involverats i den mån de har ett särskilt värde för de förstnämnda inriktningarna.

En tillbakablick: Dopingforskningen 1994-2004

Doping har under de senaste årtiondena främst diskuterats som ett idrottsligt problem; det har handlat tävlingsfusk med otillåtna prestationshöjande hjälpmedel. I kartläggningen 1994-2004 kunde man se att en hel del forskning börjat uppmärksamma doping utanför den idrottsliga kontexten, främst bruket av Anabola Androgena Steroider – AAS (Hoff & Carlsson, 2005).

I forskningen 1994-2004 var tendensen att fokusera på individuella och psykologiska förklaringar till dopingbruk, och analyserna knöts i liten grad till övergripande samhällsskeenden; användningen av AAS kopplades till avvikande eller ”extrema” individer och till ”extrema” sociala kontexter, som till fängelser, till kriminella och missbrukssammanhang samt till gymkulturen. Överlag studerades bruk av AAS utanför idrotten som ett avvikande manligt ”underground”-fenomen, där den maskulina gymmiljön var den självklara mötesplatsen. Studier av homosexuella mäns bruk, är ännu ett exempel på denna typ av forskning (ibid).

Det var också i dessa miljöer som forskningen hittade förklaringar till dopingbeteenden. I missbrukarmiljön har AAS framställts som en ny drog bland andra, i kriminella sammanhang har motivet till bruk analyserats utifrån motiv att skaffa sig styrka, respekt och mod för att kunna utföra kriminella uppdrag; i fängelset beskrivs fysisk styrka och aggressivitet som viktigt för att få status och makt. En vakt vid en dansrestaurang behöver vara stark och respektingivande, likaså en torped i den undre världen – och just egenskaperna styrka och aggressivitet är kända effekter av AAS, vilket betonades i flera studier från denna period (ibid).

Överlag är intrycket av forskningen från 1994-2004 att den analyserade användningen av AAS med utgångspunkt teorier om andra missbruk (alkohol och droger), och själva termen ”missbruk” är den som används om alla former av användning av AAS (förutom medicinskt motiverad användning). Det har också i denna forskning varit viktigt att peka på alla tendenser till blandmissbruk bland AAS-brukare, och undersöka eventuella egenskaper i steroiderna som kunnat ge upphov till detta (ibid). Men det fanns även forskare som gav en annan bild av AAS-brukaren. Mot bakgrund av ingående studier och intervjuer vid ett antal gym i Wales, beskriver Monaghan (2001) AAS-brukaren som en renlevnadsmänniska som tar avstånd från droger, alkohol, tobak och kaffe.

Om vi lämnar de ”extrema” kontexterna och övergår till de ”extrema” individerna, så har tidigare undersökningar studerat samband mellan AAS-bruk och ett antal psykologiska begrepp. Forskare har kunnat koppla AAS-bruk till narcissism, perfektionism, paranoia och depression, och till beteenden som självdestruktivitet, våldsamhet, aggressivitet och självmord (Hoff & Carlsson, 2005).

Dopingforskningen 2004-2007

Om den samhälls- och beteendevetenskapliga dopingforskningen 1994 till 2004 fokuserade på ”extrema” väl avgränsade miljöer och individer, så är forskningen 2004 till 2007 i större utsträckning intresserad av att undersöka större populationer och mer blandade grupper av individer. I den nu aktuella forskningen är gymmen fortfarande viktiga miljöer att studera, men undersökningarna och utgångspunkterna är vidare. Man intresserar sig inte för någon speciell ”subgrupp” på gymmet, utan det handlar om generella kartläggningar av bruket och av motiven till bruket bland dem som tränar på gymmen. Dessutom har det genomförts fler och mer omfattande kartläggningar av ungdomars bruk av AAS. Sammanfattat i punktform ger forskningen från 2004-2007 stöd för följande slutsatser, där slutsatserna i *Tablå (1)* finner stöd i flera eller mer omfattande studier, och slutsatserna i *Tablå (2)* stöds av enstaka eller mindre undersökningar:

Tablå 1.

- Bruket av AAS och andra dopingpreparat är omfattande på gym.
- Det finns ett samband mellan bruk av kosttillskott och bruk av AAS.
- Bruket av AAS bland ungdomar är betydande.
- Bruket av AAS bland flickor/kvinnor börjar synas.
- En övervägande andel av dem som använder AAS uppger kosmetiska skäl som den viktigaste orsaken till bruket.
- En stor andel av de kosttillskott som används är kontaminerade med AAS.
- Det finns ett samband mellan idrottslig bakgrund och AAS-bruk.

Tablå 2.

- Det finns ett samband mellan socioekonomisk bakgrund och bruk av AAS.
- Det finns samband mellan användning av AAS och negativ kroppsuppfattning.
- AAS-bruk är vanligare i de västerländska kulturerna än i de österländska.
- En stor andel av de anabola androgena steroider som används på gymmen kommer från sjukvården och bruket sker i betydande omfattning under överinseende av läkare.

Vilka studier som ligger bakom resultaten diskuteras närmare i de kommande avsnitten.

Doping på gym

Hur vanligt är doping generellt i samhället? Det vet vi egentligen ganska lite om. Undersökningarna är få och resultaten påvisar endast en begränsad användning. Undersökningar på gym förekommer lite oftare och resultaten där ger tydliga utslag på bruk av AAS och andra dopingpreparat. Utbudet av träningslokaler har ökat enormt, och även utbudet på aktiviteter har utökats för att passa alla medlemmar i familjen oavsett kön och ålder (Lund Kirkegaard, 2007). Dessutom har undersökningar visat att gymträningen passar dagens individuella människor bättre, än det ”gamla” konceptet med kollektiv träning i ideella idrottsföreningar på fasta återkommande tider (Ibsen, 2006).

När det gäller prevalensstudier på gym har det genomförts några större sådana de senaste åren. Simon et al (2006) har kartlagt 49 fitnesscentra i Tyskland. 500 personer ingick i studien, varav 69,4 procent var män. Medelåldern på deltagarna i studien var 32 år. Studien visade att 12,5 procent av gymbesökarna använde AAS. Det är väldigt många individer; i Tyskland besökte nästan 5 miljoner personer den här typen av träningsanläggningar under år 2004 (ibid).

I annan studie i Tyskland var det 13,5 procent av de 1802 tillfrågade på 113 fitnesscentra som använde AAS (Striegel et al, 2006). Detta får i jämförelse med tidigare studier av gym betraktas som en stor undersökning med ett brett urval av gym. I studien visade sig att nästan 50 procent av AAS-substanserna distribuerades via sjukvårdssystemet och över 30 procent av brukarna uppgav att användningen stod under överinseende av läkare.[2]

Jämför man dessa studier med forskningen från 1994-2004 så indikerar de omfattande studierna på gym i Tyskland att AAS-bruket är mer allmänt och utbrett än vi tidigare utgått ifrån, där koppling mellan AAS-bruk och andra riskbeteenden, som blandmissbruk och kriminalitet (”extrema” kontexter) inte är lika självklar längre. Detta understryks av en stor studie på high school-ungdomar i USA där man inte hittade något samband mellan AAS-bruk och andra riskbeteenden som bruk av narkotika och alkohol (Dodge & Jaccard, 2006). Detta behöver inte utesluta att AAS-missbruk förekommer parallellt med missbruk av andra droger. I Striegels (et al, 2006) studie fann man t ex ett positivt samband mellan användningen av AAS och användningen av kokain.

I en studie av Parkinson och Evans (2006) har man vänt sig direkt till AAS-användare, för att studera missbruksmönster. Författarna distribuerade en enkät via en Internetsida som är populär bland AAS-användare. Undersökningen omfattade 500 AAS-brukare; 98,8 procent av dem som svarade var män. Endast 2,6 procent av respondenterna var tonåringar, och den vanligaste debutåldern för AAS-bruk låg i åldersspannet 20-24 år. Resultat som framkom i studien var att 78,4 procent av de tillfrågade inte tävlade i bodybuilding och var inte heller på annat sätt idrottsaktiva. Det fanns andra skäl än tävlingsprestation bakom bruket hos det stora flertalet, vilket kan jämföras Dodge & Jaccards (2006) och Özdemirs (et al, 2005) studier, där majoriteten av brukarna på något sätt var idrottsaktiva, utöver själva gymträningen.

Ytterligare resultat från Parkinson och Evans’ (2006) studie var att 59,6 procent av respondenterna använde minst 1000 mg testosteron per vecka, vilket är ca 12 gånger så mycket som en normal medicinsk dos. Nästan alla injicerade produkterna (99,2 procent), och 13,0 procent bedömdes använda sig av riskfyllda injektioner (t ex delade sprutor). Det viktigaste skälet till AAS-bruk som uppgavs, var att få en vackrare kropp.

Doping bland ungdomar

I kartläggningen har det påträffats några omfattande studier av AAS-bruk bland yngre människor. I en studie av 1 175 polska skolelever visade resultaten påfallande höga procenttal avseende AAS-användning (Sas-Nowosielski, 2006). Undersökningen omfattade tre olika typer av skolor (grammar, secondary school preparing for university och vocational school) med elever av båda könen mellan 15 och 22 år gamla. Över 9 procent av pojkarna och över 2 procent av flickorna använder eller hade använt AAS (ibid).

I en rikstäckande studie i USA, av 15 000 elever i high school, låg siffrorna på 2,7 procent för pojkar och 0,4 procent för flickor, avseende användning av AAS (Dodge & Jaccard, 2006). Det hade varit intressant att genomföra en liknande studie på college i USA, eftersom AAS-bruk tenderar att vara vanligare bland lite äldre ungdomar (Dopingjouren, 2008).

I Turkiet har det genomförts en studie där medelålder var 21,8 år. I denna grupp på 883 individer (78 procent män och 22 procent kvinnor) var siffran för dopinganvändning 8,0 procent; 60,5 procent av dopinganvändningen utgjordes av AAS-bruk (Özdemir et al, 2005).

Centralmyndigheten för Alkohol- och narkotikafrågor brukar i sina kartläggningar komma

2 I detta sammanhang kan det nämnas att en italiensk studie har visat att kunskapen bland läkare i Italien om doping, och om vilka preparat som är förbjudna inom idrotten, är klart begränsad (Rosano et al, 2005).

fram till att ca 1 procent av pojkarna och mindre än 1 procent av flickorna har provat AAS (CAN, 2003). När det gäller just AAS har forskare pekat på att det verkar finnas en underrapportering bland brukare, till skillnad från när det gäller undersökningar av andra droger (Moberg & Hermansson, 2006). En fråga som är viktig för framtida forskning, är om det faktiskt är få ungdomar som använder AAS, eller om det finns en underrapportering. Både i studier av ungdomar och i preventionsarbete med ungdomar, är det viktigt att nå dem – att försöka hitta förutsättningar forum där kommunikationen kan ske på ungdomars villkor.

Ett sätt att nå ungdomar är att använda Internet, som är ett mycket viktigt forum för kunskapsinhämtning och kommunikation bland unga. I Tyskland har den nationella antidopingorganisationen satt igång ett stort antidopingprojekt på Internet som riktar sig till ungdomar – ”High-Five”. Detta ställningstagande gjordes mot bakgrund av en undersökning om var tyska ungdomar hämtar information om olika saker. Internet var den i särklass viktigaste källan för ungdomar (Nationale Anti Doping Agentur, 2007). Är även Internet ett bra ställe att bedriva vetenskapliga studier på, om t ex ungdomars erfarenheter av AAS? Rachon et al (2005) har genomfört en relativt stor studie i Polen via två populära hemsidor för ungdomar. I studien ingick 3687 individer, ca 50 procent av varje kön. Medianåldern bland dessa var 23 år; 6,2 procent av männen och 2,9 procent av kvinnorna använde eller hade använt AAS. Författarna fann också att AAS-bruk var kopplat till utbildningsgrad – det fanns fler AAS-användare bland de individer som hade en kortare utbildning.

Det vanligaste skälet till AAS-bruk var bland ungdomar, liksom bland gymbesökare, att förbättra sitt utseende. Sas-Nowosielski (2006:232) konstaterar i sin artikel: ”The most frequent reasons inclining adolescents toward using AAS were connected with shaping their bodies in manner allowing realization of cultural ideals of bodyshape.”

Sas-Nowosielskis (2006) siffror på AAS-användning bland skolungdomar är betydligt högre än vad som framkommit i undersökningar av svenska skolungdomar. Det kan vara så enkelt att betydligt färre ungdomar provar AAS i Sverige än i Polen. Tullens kraftigt ökade beslag av AAS de senaste åren, talar mot detta (Moberg & Hermansson, 2006). En vanlig förklaring till de låga siffrorna bland svenska skolungdomar är att AAS-bruk börjar något senare än i skolåldern, vid ca 18-22 års ålder (Thurelius et al, 2005). En annan möjlighet som kan övervägas är att bruket av AAS bland ungdomar är ganska nytt, och siffrorna kan förändras mycket från ett år till ett annat.[3]

Doping och idrott

Under många år har doping betraktats som ett idrottsligt problem, som sedan spritt sig ut till andra grupper i samhället. Dopingen inom idrotten är ganska väl kartlagd inom idrottssamfundet, inte minst via statistik från den omfattande kontrollapparaten (se Riksidrottsförbundet, 2008). Den idrottsliga dopingen har främst setts som ett problem med fusk, och det har handlat om att hitta och straffa fuskarna, framförallt på elitnivå. Doping utanför idrotten, i synnerhet bruket av AAS, har, som redan diskuterats, ofta studerats som ett ”traditionellt” missbruksproblem – AAS har blivit en ny drog på marknaden.

Användningen av dopingpreparat inom idrotten och samhället ter sig som två helt olika fenomen (Hoff & Carlsson, 2005). I Sverige genomförs det ca 4000 dopingkontroller varje år inom idrotten, och antalet dopingfall är försvinnande litet (Riksidrottsförbundet, 2008). Även om det fortfarande finns vissa idrotter som fortfarande har många dopingfall i internationella sammanhang så menar de

3 År 2007 genomfördes en mindre studie i Kalmar av bruket bland skol- och gymnasieungdom som indikerade mer än dubbelt så omfattande dopingbruk jämfört med CAN:s tidigare kartläggningar. Bland pojkarna i årskurs åtta i grundskolan och i första årskurs på gymnasiet hade 2 procent använt doping. Bland flickorna avvek resultaten ännu mer: i årskurs åtta hade 1 procent av flickorna använt doping och i första årskurs på gymnasiet hade 2 procent använt doping (Hoff & Herngren, 2007).

flesta dopingforskare, åtminstone i Sverige, att den stora utmaningen idag är att förebygga AAS- och annat dopingbruk utanför idrotten, i samhället (Andrén-Sandberg, 2008). Men icke desto mindre kan man inte gå förbi de undersökningar som visar på kopplingar mellan idrott och användningen av dopingpreparat. Låt vara att det är i en vid förståelse av idrott, och inte i första hand i tävlings- och elitidrott. I den ovan nämnda studien i Turkiet har Özdemir et al (2005) konstaterat, att användningen av doping är betydligt vanligare bland idrottare än icke-idrottare. I studien ingick 833 personer (433 idrottare och 450 som inte idrottar). Resultaten visade att 14,4 procent av idrottarna och 1,8 procent av dem som inte idrottade hade använt dopingpreparat.

Denna bild bekräftas av Dodge & Jaccards (2006), i en studie av high school-elever i USA. Bland de unga männen som inte idrottade låg användningen av AAS på 1,65 procent, och bland dem som idrottade hamnade siffran på 2,86 procent. Bland de unga kvinnorna låg AAS-bruket på 0,19 procent för icke-idrottare, och 0,40 procent för idrottare. Författarna diskuterade den idrottsliga kontexten – gymmet – som förklaring till sambandet. Idrottare kompletterar ofta sin träning med styrketräning på gym, och där kommer man i kontakt med AAS. Författarna fann även ett positivt samband mellan deltagande i idrottslig aktivitet och användningen av kosttillskott, samt ett samband mellan användningen av kosttillskott och användningen av AAS. Även Rachon et al (2005) påvisar en signifikant skillnad mellan idrottare och icke-idrottare, där bruket av AAS var vanligare bland idrottare. En studie som talar emot detta samband är Parkinson och Evans' (2006) undersökning av 500 AAS-brukare, där 78,4 procent av de tillfrågade inte var idrottsligt aktiva på annat sätt än via träning på gym; inte heller tävlade de i bodybuilding.

När det gäller sambandet mellan idrott och doping blir det viktigt att diskutera definitionen av idrott och idrottare. Betraktas gym-, fitnessträning och bodybuilding som idrott, då är det inte så konstigt att det finns ett samband mellan idrott och användningen AAS, eftersom bruket är mer frekvent förekommande i samband med dessa typer av fysisk aktivitet. I Sverige ligger vanligen denna typ av idrott utanför den officiella idrottsrörelsen, därför riktas inte heller antidopingarbetet och kontrollverksamheten mot dessa verksamheter. Idrott inbegriper mycket olika aktiviteter och målsättningar, i en vid definition av begreppet, därför blir det även viktigt att förstå, vad det är i den idrottsliga och fysiska aktiviteten som eventuellt skulle underblåsa användningen av doping. Säkert skiljer sig denna påverkan beroende på om individer idrottar av sociala skäl för att träffa vänner, om de gör det av hälsoskäl eller om idrottandet går ut på att bygga en vacker kropp; likaså kan bruket påverkas av om man idrottar på motions- eller elitnivå.

Doping och kosttillskott

Relationen mellan kosttillskott och doping är ett område som inte aktualiserades i dopingforskningen 1994-2004 (Hoff 6 Carlsson, 2005). Däremot berör flera studier 2004-2007 olika aspekter av kosttillskott i relation till doping och AAS. Användningen av kosttillskott är något som ökar i dagens samhälle (jfr Andrén-Sandberg, 2004).[4] I den stora amerikanska high school-studien visade det sig att 15,6 procent av pojkarna och 1,1 procent av flickorna använde lagliga prestationshöjande preparat som kosttillskott. Bland dem som idrottade låg procentsatserna något högre (Dodge & Jaccard, 2006).[5] Undersökningen påvisar inte

4 I Sydsvenskan (6 september 2007) presenterade man siffror på den ökade försäljningen av olika kosttillskott, t ex Norrmejerier hade ökat sin försäljning av återhämtningsdrycker med 255 procent sedan 2004. Enligt Branschorganisationen Hälsokostrådet (2007) säljs det kosttillskott för 1,4 miljarder i Sverige (år 2006).

5 I Kalmar-kartläggningen (Hoff & Herngren, 2007) undersöktes också användningen av kosttillskott. På gymmen använde 1 av 3 personer regelbundet kosttillskott, 8 av 10 av dessa var män. I ålderskategorin 21-24 år använde 64 procent av gymbesökarna kosttillskott. På skolorna (i årskurs åtta och i första årskurs på gymnasiet) använde 16 procent av pojkarna och 10 procent av flickorna regelbundet kosttillskott. I en alldeles färsk studie på gym i Stockholm visade det sig att 80 procent av dem som använde AAS (5 %) också regelbundet använde kosttillskott. Av dem som inte använde AAS, så var det 42 procent som regelbundet använde kosttillskott (Leifman & Rhenman, 2007).

bara ett samband mellan idrottslig aktivitet och användningen av kosttillskott, utan även mellan användningen av kosttillskott och användningen av AAS. I studien konstaterar man att det är 26 gånger så stor sannolikhet att man börjar med AAS om man använder tillåtna prestationshöjande preparat (kosttillskott). För att använda ett slitet uttryck från narkotikadebatten, verkar det som om kosttillskott kan fungera som en ”inkörsport” till bruket av tyngre prestationshöjande preparat som anabola androgena steroider. Syftet med de olika preparaten är i många fall detsamma – att prestera bättre.

En annan viktig aspekt på relationen mellan doping och kosttillskott är risken att få i sig kosttillskott som är kontaminerade eller preparerade med anabola steroider. Detta fenomen har studerats i en internationell undersökning (Geyer et al, 2004, jfr Maughan, 2006). Studien är genomförd i 13 länder; den innefattar 315 leverantörer av kosttillskott, och sammanlagt 634 stickprov har analyserats. Företagen som producerar kosttillskotten var lokaliserade till USA, Storbritannien, Italien, Nederländerna och Tyskland. Resultaten visar att sammanlagt 14,8 procent av stickproven innehöll anabola androgena steroider, utan att det deklarerades på produktetiketten. 21,1 procent av de kontaminerade produkterna kom från företag som även saluför AAS-produkter, och 9,6 procent kom från företag som inte hade någon produktion av anabola steroider. Av de stickprov som gav utslag var 25,8 procent inhandlade i Nederländerna, 22,7 procent i Österrike och vardera 18,8 procent i USA respektive Storbritannien (Geyer et al, 2004, jfr Maughan, 2006).

Av de personer som använder kostillskott kan det alltså finnas många som är omedvetna om att de får i sig anabola steroider. Det är naturligtvis även tänkbart att individer har kunskap om vilka kosttillskott som innehåller AAS, och då blir användningen av dessa ett medvetet AAS-bruk. Troligen förekommer båda scenarierna. Om vi hypotetiskt tänker oss det första scenariot, att man är omedveten om att produkterna som man använder innehåller AAS, och samtidigt tillför den kunskap som finns om det omfattande användande av kosttillskott som förekommer i samhället inte minst bland gymbesökare, då skulle det verkliga procenttalet av AAS-brukare från de ovan redovisade gymundersökningarna helt plötsligt kunna hamna på en helt annan nivå – man måste sannolikt kalkylera med att det finns ett visst dolt eller omedvetet bruk, som skulle justera siffrorna uppåt.

En viktig aspekt på kontaminerade kosttillskott är den rättsliga, som i sin tur består av flera problem. Hur ska idrottens dömande instanser i dopingfrågor behandla idrottare som ertappas i kontroller med AAS i kroppen, som kommer från kosttillskott där steroiderna inte redovisats i innehållsdeklarationen? Kan man överhuvudtaget betrakta det som ett brott mot dopingreglerna om idrottaren inte haft någon möjlighet att i förväg veta att kosttillskotten innehåller förbjudna substanser? Ja, så är det faktiskt inom det idrottsliga internationella regelverket. Det är inte den åtalande instansen som ska bevisa idrottarens intentioner att dopa sig – det räcker att bevisa att idrottaren har ett förbjudet preparat i kroppen – idrottaren har ett ”strikt ansvar” avseende dopingpreparat (såvida inte idrottaren kan bevisa att han eller hon utan vetskap t ex har blivit ”förgiftad” av någon annan person; det råder s k omvänd bevisbörda).[6]

En undersökning som belyser detta problem, och vilka konsekvenser det kan få i det civila samhällets rättssystem, handlar om ett fall i Tyskland (Striegel et al, 2005). En professionell elitidrottare hade blivit suspenderad av de idrottsliga dopinginstanserna. Idrottaren ansåg sig vara oskyldig, eftersom han ovetandes fått

6 I engelsk litteratur benämns denna ordning för ”strict liability”, som åsyftar att idrottaren har ett strikt ansvar för dopingpreparat som finns i den egna kroppen. I ett civilrättsligt brottsåtal är det vanligen bruk av en viss otillåten substans (drog) som bestraffas, dvs ett medvetet eller intentionellt bruk. Att en otillåten substans påträffas i en individ är teoretiskt sett inte tillräckligt för att döma individen – åklagaren måste visa att det är ett medvetet bruk, vilket i realiteten sällan är ett problem – men den principiella skillnaden betraktas ändå i rättslig litteratur som viktig (se t ex O’Leary, 2001).

i sig en dopingsubstans via ett kosttillskott, där den otillåtna substansen saknades i innehållsdeklarationen. Sedermera stämde idrottaren företaget som sålt produkten, och krävde kompensation för förlorad arbetsinkomst (pga av avstängningsdomen). Den rättsliga instansen i Tyskland gav idrottaren rätt. Konsekvenserna av domen är naturligtvis svåra att förutse, men hade företaget inte behövt ta ett ekonomiskt ansvar för konsekvenserna av försäljningen av ett kosttillskott innehållande icke deklarerade otillåtna dopingpreparat, så hade det varit ett stort bakslag för antidopingarbetet. Frågan är hur liknande fall går i andra länder. Men även om idrottaren kan få ekonomisk kompensation för en avstängningsdom, så kan den idrottsliga karriären vara över, med allt vad det innebär för individen.

Mot bakgrund av den idrottsliga regleringen och risken att få i sig otillåtna preparat, kan egentligen idrottaren endast dra en rimlig slutsats – vill man vara säker på att inte ertappas i dopingkontroller, så måste man avstå från kosttillskott. Detta är också en slutsats som de Hon och Coumans (2007) drar i en undersökning av flera fall där idrottare hävdat att de fått i sig de otillåtna substanserna via lagliga kosttillskott. Dessutom menar författarna att det är enormt svårt att få till stånd ett kvalitetssäkringssystem som kan garantera att kosttillskott inte kontamineras med dopingpreparat. de Hon och Coumans (2007) konstaterar att det idag inte existerar några säkra kontrollsystem, mot bakgrund av en analys av ett mycket omfattande, men misslyckat, kvalitetssäkringssystem i Nederländerna.[7]

Om vi blickar ut utanför elitidrotten är det viktigt att sprida kunskapen om kontaminerade kosttillskott till den allt större konsumentgrupp, som köparna av kosttillskott har blivit på mycket kort tid. Försäljningen av naturläkemedel och kosttillskott är enormt stor, och de flesta köparna är inte elitidrottare, utan ”vanliga” människor, inte minst ungdomar, som använder dessa preparat tillsammans med träning eller som substitut för en allsidig kost, eller bara för att det är ett beteende som utvecklas i dagens samhälle. Här kan många individer helt oavsiktligt få i sig olagliga och hälsovådliga preparat.

7 Kvalitetssäkringssystemet (NZVT) genomfördes tillsammans av ett antal organisationer i Nederländerna: branschorganisationen för producenter och distributörer av kosttillskott, den olympiska kommittén och sportkonfederationen (motsv RF i Sverige) samt den officiella antidopingorganisationen.

Diskussion: Samhällstrender relaterat till användningen av doping

Vid en genomgång av den internationella dopingforskningen år 2004-2007, finner man vissa återkommande mönster och faktorer som är kopplade till användningen doping. Ett tydligt mönster som framkommer i de prevalensstudier som genomförts, är det angivna motivet *att förbättra utseendet* som förklaring till varför man använder dopingpreparat. Kosmetiska skäl dominerar klart framför andra (Parkinson & Evans, 2006; Rachon et al, 2005; Sas-Nowosielski, 2006; Özdemir, 2005; jfr Leifman & Rhenman, 2007). Individer använder doping för att förbättra sitt utseende, man vill få större muskler, man vill minska på sitt kroppsfett och sin vikt. Dessa förklaringar till användandet av dopingpreparat går att koppla till en genomgripande trend i samhället: (1) *skönhetsidealen* – och synen på kroppen. Pope (i Andrén-Sandberg, 2008) talar om samhällets muskulösa skönhetsideal termer av: ”a supportive social climate”; detta sociala klimat utgör en bidragande orsak till användningen av AAS (ibid, s 6).

I detta kapitel diskuteras betydelsen av (1) skönhetstrenden, i relation till tre ytterligare samhällstrender: (2) den moderna trenden *hälsa*, (3) samhällets *prestationskultur*, och (4) *medikaliseringen* i samhället. De tre sistnämnda trenderna har inte en lika tydlig koppling till doping, men vid en noggrannare läsning av den dopingforskning som finns och mot bakgrund av vad samhällsvetenskapliga forskare fokuserar som viktiga samhällsskeenden i dagens västerländska samhälle, kan man även uttolka relationer mellan den ökade dopinganvändningen i samhället och dessa tre sist nämnda trenderna. Samtliga dessa fyra sociala processer menar jag är viktiga att analysera om man vill förstå doping i samhället.

I denna avslutande analys handlar det inte om att finna ensidiga eller rena kausala samband mellan någon eller några av de respektive sociala processerna, som beskrivits i det föregående (trenderna), och användningen av doping. Att etablera säkra kausala samband är vid komplexa samhällsskeenden ytterst svårt (se t ex Beronius, 1991). Enligt ett *genealogiskt* synsätt försöker man etablera sociala förklaringar av sociala fenomen genom att beskriva sociala processer som föregår fenomenet (som enligt detta perspektiv också i sig är sociala processer, Beronius, 1991). I detta fall handlar det om att beskriva vilka sociala processer som föregår och påverkar dopinganvändningen i samhället (skönhetsideal, hälsa, prestation och medikaliseringen). Men samhällstrenderna påverkar inte enbart i sig själva det ökade intresset för användningen av dopingpreparat, utan de olika trenderna underbygger och påverkar varandra; processerna hänger ihop och influerar varandra i en komplex, kontextuell och dynamisk interaktion.[8] Därför blir det även viktigt att analysera hur processerna ömsesidigt påverkar varandra, och sedermera att försöka fastställa hur dessa komplexa skeenden utgör generativa mekanismer för användningen av doping i dagens samhälle.

Skönhetsideal, hälsa, prestation och medikaliseringen i samhället

I dagens samhälle fokuserar vi allt mer på kroppen och utseendet (se t ex Bauman & May, 2004; Johansson, 1998, 2006; Lund Kirkegaard, 2007; Pope i Andrén Sandberg, 2008). Det är enormt viktigt att vara vacker, och att använda konstgjorda hjälpmedel har blivit accepterat. Tatueringar som tidigare betraktades som stigmata på socialt utslagna och kriminella män, ser man idag på de flesta grupper av människor. De tjänar idag som kroppsliga smycken även på (unga) kvinnor. Skönhetsoperationer är också något som verkar ha fått en allmän acceptans i samhället. Och här är förhållandet det omvända mot tatueringar; från att ha varit ett ganska ovanligt fenomen i samhället, men nästan uteslutande för kvinnor, så har även män blivit flitiga konsumenter av dessa tjänster (Johansson, 2006:146).

8 *Dynamisk* i motsats till statisk.

Vid en Nordisk konferens om AAS i Uppsala, september 2007, visade Harrison G. Pope (se Andrén-Sandberg, 2008) tydliga exempel på utvecklingen av dagens muskulösa skönhetsideal, i relation till en ökade användning av AAS i samhället. Pope (ibid) belyste utvecklingen med hjälp av bilder på olika leksaksfigurer (manliga dockor) mellan åren 1977 och 1997. Förändringen av dockornas kroppsliga konstitution var betydande. Dockornas kroppar hade 1977 en sparsam och ”normal” konstitution; 1997 hade de vuxit till muskelpaket. En yttermera intressant sak i detta sammanhang, är det faktum att detta är ideal som vänder sig direkt till socialt mycket mottagliga barn, i form av leksaker. Redan tidigt blir vi alltså påverkade av samhällets normer kring muskulöst utseende. Utvecklingen är densamma även för kommersiella produkter som vänder sig till vuxna personer. Pope (ibid) jämförde Play-girl-magasinets omslagspojkar, som idag är betydligt mer muskulösa än för 20 år sedan.

I en jämförelse mellan män i USA och Europa med män i Taiwan (i huvudsak kineser), har Yang et al (2005) kunnat visa att det finns påtagliga skillnader i synen på den manliga kroppen i väst och öst. Författarna menar att det finns kulturella och historiska skillnader som kan förklara detta. I väst finns antikens muskulösa ideal, och i den kinesiska kulturen riktar sig idealen mer mot psykisk styrka, att tänka självständigt och mod. I Taiwan exponeras inte den nakna (eller halvnakna) manskroppen i media tillnärmelsevis i samma utsträckning som i väst, inte heller den nakna kvinnokroppen. I öst finns inte heller motsvarande hälsotidningar, som blivit vanliga i väst, där bilder på lätt klädda ”perfekta” kroppar pryder sidorna (ibid). *Hälsotrenden* verkar underbygga *skönhetstrenden*; i hälsomagasinen exponeras de hälsosamma kropparna i formen av vackra kroppar, mätt med dagens västerländska ideal. Detta är inget nytt fenomen; redan i slutet av 1800-talet värderade läkarvetenskapen hälsa i form av normativa uppfattningar om ur en frisk kropp skulle se ut (Johannisson, 2004). Socialpsykologen Thomas Johansson (2006:143f) reflekterar på följande vis över detta samband mellan skönhet och hälsa:

> När jag strövar omkring i den livsmedelsaffär där jag brukar handla och tittar på tidskrifthyllorna, slås jag av den stora mängden tidningar som på ett eller annat sätt berör frågor om hälsa och kropp. Det finns en hel hylla som i första hand verkar rikta sig till kvinnor. Vissa tidningar betonar kost och livsstil, medan andra trycker hårdare på träning. Men det är lätt att se att det rör sig om samma grundkoncept. /…/ Det finns något hurtfriskt över hela denna kulturyttring, något enkelt och oproblematiskt. Samtidigt är det svårt att undvika att i detta sammanhang fundera över utbredningen av anorexi och andra ätstörningar. Andra funderingar handlar om småtjejer som bantar, unga män som äter dopingpreparat eller alla de som besöker en plastkirurg /…/.

Idag är hälsa och träning enormt viktigt. Välfärdssjukdomarna leder till stora ekonomiska kostnader för samhället, förutom det lidande som de orsakar för enskilda individer. Fysisk aktivitet är bevisligen nyttigt för fysisk och psykisk återhämtning, men även för att förebygga medicinska problem. Satsningen på fysisk aktivitet på recept (FaR) är en tydlig konsekvens av denna utveckling (jfr Mellquist, 2006). Det är hälsosamt med träning, mindre socker och fett i kosten osv, men det finns en gräns där en överfokusering på att följa dessa rekommendationer blir ohälsosamma; när träningen leder till hälsovådligt smala kroppar, eller till bruk av skadliga preparat som AAS. Aurélio et al (2005) konstaterar, i sin genomgång av forskningen kring den fysiska aktivitetens påverkan på humöret, att det finns många positiva effekter av träning på det psykologiska välbefinnandet, men också negativa, som överdriven träning och ätstörningar:

> For some individuals, physical activity becomes an obsession, resulting in an exaggerated preoccupation with exercise and

> excessive training /…/. These studies pointed to differences between characteristics of individuals that present excessive exercise associated to an eating disorder, and individuals that present excessive exercise with no sign of an eating disorder (s 63).

I det betydande antalet fall av ätstörningar som uppmärksammats under de senaste åren kan man inte bortse från hur de samhälleliga kroppsidealen och fokuseringen på träning och hälsa påverkar ofta unga kvinnor och flickor, men även pojkar och män (Riksidrottsförbundet, 2004; Swanberg, 2004). Mäns muskelbyggande och AAS-bruk har jämförts med anorexi hos kvinnor. Båda beteendena är enligt Pope (1997) reaktioner på de västerländska kroppsidealen, men de tar sig ofta ”spegelvända” uttryck beroende på genus: kvinnor med anorexi ser sig som tjocka, när de studerar sig själva i spegeln – oavsett hur smala de egentligen är, och muskelbyggande män betraktar sig som små och klena trots att de i själva verket är ovanligt stora och muskulösa. I AAS-litteraturen används begrepp som ”muscle dysmorphia” och ”reverse anorexia in men” för att beskriva det senare tillståndet (Goldfield et al, 2006; Kanayama et al, 2003, 2006; Pope et al, 1993, 1997; jfr Keane 2005). I botten ligger en missnöjdhet med kroppen som går att koppla till de rådande skönhetsidealen. Men även hälsotrenden och fokusering på träning och fysisk aktivitet har betydelse enligt Aurélia et al (2005:63), som säger följande om sambandet mellan träning och ”muscle dysmorphia”:

> In addition to its association with physical activity, evidence indicates a relationship between the presence of muscle dysmorphia and a history of mood, anxiety, and eating disorders, as well as anabolic-androgenic steroid use.

Även om det är individuellt betingat huruvida man utvecklar ”muscle dysmorphia”, så har man inte kunnat fastställa några övriga psykiatriska sjukdomar hos de individer som fått diagnosen (Aurélia et al, 2005:63).

Hälsotrenden och människors behov av fysisk aktivitet har passat in väl i det utbud av träningsformer som fitness- och gymindustrin kan erbjuda. Denna industri har vuxit lavinartat den senaste tiden (Lund Kirkegaard, 2007). Olika former av fitness- och gymträning ersätter eller kompletterar den traditionella föreningsidrotten (Ibsen, 2006:38-39). Ibsen (2006) kopplar det förändrade idrottsmönstret till grundläggande förändringar i vardags- och arbetslivet. I dagens tidseffektiva, prestationsinriktade och individualiserade samhälle krävs individuella träningstider anpassade efter individuella behov för att uppnå maximal rationalitet i livet:

> Alting sker med stadig større hastighed, samtidigt med at hverdagen er blivit mindre skematisk og mere omskiftelig for mange. Bl a har stadig flere skiftende arbejdstider. En følge af dette tidspres i hverdagen er en genomgibende rationalisering af den tid, som bruges på opgaver og aktiviteter. (Ibsen, 2006:39)

Skönhetsidealen och hälsotrenden formas inom ramen för samhällets *prestationskultur*. Dagens hälsobehov har vuxit fram i ett högpresterande och tidspressade samhälle där människor upplever att det finns för lite tid för återhämtning och vila. Människor har svårare att hinna med det dagliga livet: arbete, familj, barn, släkt, vänner, fritidsintressen, idrott etc. Kraven i arbetslivet uppfattas som högre. Psykiska sjukdomar, stress och utmattningssyndrom är allt vanligare. Det stillasittande, inrutade och stressade livet behöver en motpol i form av träning och hälsokurer.

Prestationskulturen finns inte bara inom arbetslivet utan den genomsyrar samhället i stort, och tar sig olika utryck, såväl materiella och fysiska som ideella och psykiska. I den idag starka konsumtionskulturen presterar man och skaffar sig status genom konsumtion av materiella och fysiska ting; prioritet ges åt yttre värden (Featherstone, 2007; Johansson, 2006; Slater, 1998). Det gäller att ha det fina

huset med det designade köket, den dyra bilen, barnen ska ha de finaste kläderna och den dyraste utrustningen till sitt fritidintresse – och nu ger det även status att ”äga” den vackraste kroppen, som kan ”inhandlas” på gymmet:

> Det centrele kommercielle element i den kroppshistoriske socialiseringsproces er, at kroppens ideelle fysik og udseende langsamt bliver til en kommerciel vare, der kan købes. /.../. Forestillingen om, at smukke menesker har gode liv, står som et usvækket og effektfuldt mantra for fitnessindustriens kommercielle succes.” (Lund Kirkegaard, 2007:132)

Lund Kirkegaard (2007) menar att människan i det moderna individualiserade samhället har fått ett individuellt ansvar för sin kropp (jfr Slater, 1998). Likaledes konstaterar Johansson (1998), i sin undersökning av gymkulturen, friskvård och estetik, att det för individer idag finns möjligheter, och ett stort intresse för, att förändra sin kropp och därmed sin identitet. Denna syn, att individen själv kan ändra utseendet på sin kropp, är ett nytt fenomen i samhället enligt Johansson (2006). På gymmen skulpteras dessa nya kroppar disciplinerat och målmedvetet, och i de många speglarna på gymmen ser man de färdiga resultaten (Johansson, 1998).[9] Men det finns en hake; gymmen där friskvård och hälsa blivit kommersiella framgångar, är även miljöer där studier påvisat relativt omfattande användning av AAS och andra dopingpreparat – hälsa kan bli ohälsa:

> …muskel- och fitnesskulturen sägs handla om friskvård och hälsa /…/. I värsta fall involverar denna livsstil ett användande av olika dopingpreparat. /…/. Många av de individer jag intervjuat plågas av sitt ”idealjag”, dvs de krav de ställer på sig själva blir alltför hårda. Det är inte heller ovanligt att kroppsfixering leder till ätstörningar och andra typer av subjektivt lidande. (Johansson, 1998:179)

Kraven på prestation och möjligheterna till konsumtion i det moderna samhället blir en grogrund för användningen av dopingpreparat (som också ofta benämns ”performance enhancing substances” [prestationshöjande substanser] i engelskspråkig litteratur). Johansson (1998:123) beskriver gymkulturen som en fostran av män, som prioriterar en viss sorts manlighet. Denna innehåller målinriktning, disciplin och asketism – kroppskulturen är prestationsorienterad. Med prestationshöjande substanser (såväl lagliga som olagliga), finner man genvägar till effektiva prestationer, oavsett om det är på gymmet för att få en vackrare kropp – snabbare – eller om det är på arbetet för att orka en stund till.

Tidspressen gör också att vi inte alltid hinner laga nyttig mat och vi hinner inte heller avnjuta den i en lugn och avslappnad miljö, istället kompletterar vi med olika former av hälsokost och pressar in ett träningspass på lunchen, och ibland unnar vi oss en spahelg för återhämtning och vila. Tendensen att använda allt mer kosttillskott och vitaminer menar jag kan kopplas till – *medikaliseringen* i samhället (Kryger Pedersen, 2003; Waddington, 2000; Zola, 1972). Detta är en vetenskaplig diskurs som tar sin utgångspunkt i den medicinska professionens och läkemedelsindustrins utveckling. Denna utveckling kan beskrivas utifrån att den medicinska professionen uppfinner allt fler diagnoser på sjukdom, allt fler mänskliga tillstånd är sjuka, och behöver således behandlas medicinskt (Illich, 1975; de Swaan, 1988). En viktig del i medicinsk behandling utgörs av användningen av kemiska preparat – mediciner. Allt fler läkemedel uppfinns för att bota allt fler sjukdomar. Vill man se det krasst ekonomiskt är detta en utveckling som gynnat både den medicinska professionen och läkemedelsindustrin (Waddington, 2000; Zola, 1972; jfr Keane, 2005). Denna utveckling har även satts i samband med doping inom idrotten (Pedersen, 2003; Waddington, 2000).

9 Denna ytliga konstruktion av den vackra kroppen kan jämföras med en mer inåtblickande kultur, där inre psykologiska och ideella värden – vem du är, vilka personliga egenskaper och värderingar du har – är viktigare än vad du åstadkommer, presterar och äger (jfr väst-öst-dikotomin, Yang et al, 2005).

Försäljningen av kosttillskott är en enormt stor industri idag, som påpekats ovan i rapporten. En rimlig tanke är att medikaliseringen av samhället tar en ny inriktning i och med det ökade utbudet och den ökade efterfrågan på naturläkemedel och kosttillskott. Rationaliteten i denna kultur är densamma som när det gäller medicinska preparat: att hitta enkla och snabba lösningar på fysiska och psykiska problem och utmaningar. Och det skapas nya lukrativa marknader i konsumtionssamhället, som är tätt förknippade med hälsa, skönhet och prestation – där gymmen har ett utbud av samtliga dessa ”produkter”, inklusive (ofta) kosttillskott (jfr Lund Kirkegaard, 2007).

Den amerikanska high school-studien, som belyser ett samband mellan användning av kosttillskott och användningen av AAS, accentuerar betydelsen av denna utveckling i relation till den ökade användningen av AAS i samhället (Dodge & Jaccard, 2006). Användningen av kosttillskott fungerar som genvägar till fysisk och psykisk utveckling och återhämtning (jfr Lund Kirkegaard 2007:133). Samma funktion har doping och AAS – det är genvägar till effektivare prestationer, muskulösare kroppar, fysisk återhämtning etc.

Kan prestationskulturen även vara en förklaring till varför idrottande ungdomar använder doping i större utsträckning än de ungdomar som inte idrottar? (jfr Dodge & Jaccard, 2006; Özdemir et al, 2005) Tävling och prestation är viktiga ingredienser i idrotten. Det som möjligen talar mot detta är att idrottens kontrollsystem gör risken avsevärd att ertappas om man är en tävlingsidrottare. Dodge & Jaccards (2006) förklaring till sambandet var att idrottare söker upp träningsmiljöer, där man kommer i kontakt med AAS, t ex på gymmet. Styrketräning fungerar ofta som komplement till annan idrottslig aktivitet. Detta ter sig inte osannolikt, och i så fall är det den idrottsliga gymkontexten som är avgörande för den ökade risken för dopingbruk. Men för att återknyta till samhällets prestationskultur, så är även prestation en viktig drivkraft inom en stor del av idrotten: man tränar för att prestera bättre, man tävlar för att vinna (prestera). Tangen (2004) menar att prestationslogiken är idrottens grundläggande funktion – att vinna och att prestera bättre för varje gång man tränar och tävlar. Utgår man från denna definition av idrotten är det kanske inte så konstigt att det är inom idrotten som de prestationshöjande dopingsubstanserna först har etablerat sig. Det är rentav logiskt att man dopar sig inom idrotten, enligt Tangen (2004).

Därvid kan man i så fall diskutera ytterligare en drivkraft till förklaringen av sambandet mellan idrott (inte bara elit- och tävlingsidrott) och doping bland ungdomar i USA, som Jaccard och Dodge (2006) lyfter fram i sin studie, och bland yngre individer i Turkiet, som Özdemir et al (2005) beskrivit; det är inte bara den *geografiska* idrottsliga kontexten (t ex träning på gym, där man kommer i kontakt med AAS) som är viktig, utan även den *sociala* idrottsliga kontexten: prestationskulturen, som indirekt kan påverka individer till att använda doping för att förbättra sina prestationer i tränings- och tävlingssammanhang. Idrottare fostras i en miljö där prestation, tävling och vinst är viktiga värden. Inkluderar man fitness- och gymträningen i idrotten, är prestationskulturen även tydlig där. Detta är en inställning som kan överföras till andra sociala sammanhang, men även omvänt påverkas säkert idrott och fysisk aktivitet av samhällets allt mera fokusering på effektivitet, konsumtion och prestation.

Avslutning

För att ytterligare försöka tydliggöra sambandet mellan de fyra samhällstrenderna, och hur de interagerar och påverkar inställningen till doping i samhället, försöker jag avslutningsvis att syntetisera resonemangen. De samhälleliga *skönhetsidealen* bildar en lämplig utgångspunkt. Denna trend kan knytas till *hälsotrenden*. En överviktig kropp och ett stillasittande liv är inte hälsosamt – detta budskap når oss dagligen via media, forskningsrapporter och reklam. Att träna handlar också om att hålla sig ”fit”, kroppsligt – att skaffa sig en vacker,

vältränad, smal eller muskulös kropp. Hälsotrenden går hand i hand med skönhetstrenden (jfr Johansson, 2006).

I strävan efter bättre hälsa och vackrare kroppar, inom ramen för *prestationskulturen*, ökas effektiviteten i träningen. Träningen ska vara målmedveten, resultera i synbara förändringar av kropp och hälsa. Andra värden som traditionellt tillskrivs träning och idrott som social samvaro, lek och glädje blir underordnade effektiviteten (jfr Ibsen, 2006). Hälsotrenden inom ramen för prestationskulturen leder inte endast till effektivare träning – den ökar också kraven på individer *att* träna, *att* prestera (jfr Bauman & May, 2004:133 ff). De riktigt duktiga lyckas effektivt klämma in ett träningspass på lunchen för att slippa ta tid från arbetet, familjen eller andra fritidsintressen – man kan prestera i alla sammanhang – och hinner man inte äta så finns alltid kostersättning, proteintillskott och vitaminer (så gör vi något åt vikten på samma gång), vilket leder oss in till *medikaliseringstrenden*.

Hela synen på medicin och kosttillskott som en genväg till bättre fysiskt och psykiskt mående, samt som hjälpmedel till bättre prestationer i vardagen, i arbetet, på fritiden, i träningen osv är lockande och underbygger individers närmanden till mer effektiva prestationshöjande substanser. Logiken är densamma mellan lagliga och olagliga preparat – att prestera bättre – och zonen dem emellan är påtagligt grå. Likaså verkar det finnas en tendens att gå från ”oskyldiga” preparat till mer potenta och förbjudna substanser, i jakten på vackrare kroppar och bättre prestationer – och allt kan konsumeras på en växande internationell marknad.[10] Och i slutet av denna glidande skala slår de positiva effekterna av hälsotrenden över i osunda konsekvenser.

En motsägelsefull karakteristik i samtliga dessa samhällstrender är att de inte kan betraktas som enbart negativa eller skadliga – snarare tvärtom, främst då det gäller hälsotrenden. Även medikaliseringen och utvecklingen av nya läkemedel eller effektiva kosttillskott kan betraktas som något positivt i samhället, likaså att prestera väl och att ha en vältränad och snygg kropp. Men det finns en gräns för när det positiva går över i något negativt och osunt: när någon blir utbränd är prestationskraven för höga, när smärtstillande piller blir lösningen på problem som egentligen har sin grund i icke medicinska problem, när vitaminer och kostillskott ersätter en allsidig kost och inte minst ersätter social samvaro och vila vid middagsbordet. Skönhetsidealen sätter press på framförallt unga människor att uppnå ett ”idealt” utseende – det blir en avgörande existentiell fråga, fast att det är få av oss som skulle vilja tillskriva skönheten denna existentiella och avgörande betydelse, särskilt inte när idealen övergår i ohälsosamma beteenden som anorexi och bruk av anabola androgena steroider. Det positiva ingångsvärdet i dessa samhällstrender gör det naturligtvis svårare att på ett effektivt sätt förhindra utvecklingen. Men mer forskning, kunskap och en större medvetenhet i samhället om sociala processer som understödjer utvecklingen av dopingbruk är naturligtvis viktigt för att kunna förändra en icke önskvärd samhällsutveckling. Syftet med denna kunskapsöversikt har varit att sammanfatta tillgängliga forskningsresultat på dopingområdet 2004-2007, och att diskutera dessa utifrån samhällsvetenskapliga perspektiv. Förhoppningsvis kan rapporten bidra till en ökad medvetenhet om förhållandet mellan doping och samhälle – i samhället – samt till ett större intresse för dopingfrågorna inom samhälls- och beteendevetenskaperna.

10 Preparaten inhandlas ofta via Internet (Moberg & Hermansson, 2006).

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APPENDIX

Publications of social and behavioural studies on doping and anti-doping policy, 2004-2007[1]

The publications are presented in following order: First, Scandinavian articles, and then international articles. The publications are sited in six different categories:

(1) Research in anti-doping

(jurisprudence, sociology of law, political science, economics, intervention, prevention, doping control)

(2) Social science

(sociology, culture, and society)

(3) Behavioural science (social behaviour)

(psychology, psychiatry, forensic medicine, research in the fields of social work, alcohol, drugs, addiction and adolescent)

(4) History

(5) Ethics and philosophy

(6) Science

(natural science, medicine and pharmacy with relevance for jurisprudence, behavioural- and social sciences)

There are of course no absolutely strict borders between different research disciplines, and neither are there precise lines between the categories in this inventory.

1 To avoid a gap between this research review [2004-2007] and the earlier published research review [1994-2004] (Riksidrottsförbundet, FoU 2005:1, Hoff & Carlsson), I have included publications from 2003 which was not included in the former review.

Articles published in Scandinavian journals, 2004-2007

Research in anti-doping

Author	Eriksson, Bengt O; Nyberg, Håkan
Title	WADA har antagit nya dispensregler – tema: doping [WADA has adopted new exemptions rules – theme: d oping]
Journal	Svensk idrottsmedicin [Swedish journal for sports medicine]
Year/vol/no/pp	2004; 2; 8-10
Abstract	The authors describe the new WADA exemption rules.

Author	Fredriksson, Susanne
Title	Inga skandaler i hundsporten: positiv utvärdering av nya dopingreglementet
Journal	Svensk veterinärtidning
Year/vol/no/pp	2006; 4; 6-10

Author	Svensk idrott
Title	Mot guld utan fusk
Journal	Svensk idrott
Year/vol/no/pp	2004; 3; 28-29
Abstract	Intervju med SOK:s ordförande Stefan Lindeberg.

Author	Söderberg, Håkan
Title	Stora förändringar inom antidoping
Journal	Svensk idrott
Year/vol/no/pp	2004; 5; 18-19

Social science

Author	Kryger Pedersen, Inge
Title	Doping fremmer et andet spil end sport [Doping favours another game than sport]
Journal	Idrottsforum.org (www.idrottsforum.org) [Sports forum.org] (Journal published on the Internet: www.idrottsforum.org)
Year/vol/no/pp	2004-02-24

Ethics and philosophy

Author	Andrén-Sandberg, Åke
Title	Visst kan vi designa idrotts mästare: tema doping [Of course we can design world champions: Theme doping]
Journal	Svensk idrottsmedicin [Swedish journal for sports medicine]
Year/vol/no/pp	2004; 2; 12-13
Subject terms	doping, doping control, sports, moral philosophy

Author	Berdal KG
Title	Genetic ”improvement” of man
Journal	Genialt
Year/vol/no/pp	2003; 12; 4; 12-3
Abstract	Genetisk ”forbedring” av mennesket.

Author	Jönsson, Kutte
Title	Är idrott moraliskt försvarbart?
Journal	Svensk idrottsforskning
Year/vol/no/pp	2005; 3; 68-71
Abstract	En kritik av idrottsidealismen, d v s den officiella idrottsideologin.

Science

Author	Andrén-Sandberg, Åke
Title	Visst kan vi designa idrotts-mästare: tema: doping
Journal	Svensk idrottsmedicin
Year/vol/no/pp	2004; 2; 12-13

Author	Andrén-Sandberg, Åke
Title	Partydroger som dopingmedel: numera är hasch och mari juana tydligt klassade som dopingmedel
Journal	Svensk idrottsmedicin
Year/vol/no/pp	2004; 3; 14

Author	Andrén-Sandberg, Åke
Title	Dopning är främst ett samhällsproblem: medicinsk kommentar
Journal	Läkartidningen
Year/vol/no/pp	2004; 23; 1982-1983

Author	Börjesson, Mats; Eriksson, Bengt O.
Title	Speciella krav på astmatiker vid OS: tema: doping
Journal	Svensk idrottsmedicin
Year/vol/no/pp	2004; 2; 11

Author	Carlsson, Christian
Title	Nu fattas bara fotbollen i Wada: antidoping
Journal	Svensk idrott
Year/vol/no/pp	2005; 1; 20-21

Author	Carlsson, Christian
Title	Vistelserapport mot nya höjder
Journal	Svensk idrott
Year/vol/no/pp	2005; 5; 26-27

Author	Carlsson, Christian
Title	Stopp för livsfarliga genvägar
Journal	Svensk idrott
Year/vol/no/pp	2006; 1; 16-18

Author	Eriksson, Bengt O.; Nyberg, Håkan ; Persson, Peter M.
Title	Ny dopningslista ger läkare problem: vanliga läkemedel, t ex kortison, nu klassade som dopningspreparat
Journal	Läkartidningen
Year/vol/no/pp	2004; 23; 2000- 2001

Author	Eriksson, Bengt O; Nyberg, Håkan
Title	Nya dopinglistan från 1 januari 2006 - kortison för lokalt bruk inte längre med!
Journal	Läkartidningen
Year/vol/no/pp	2005; 47; 3590-3591

Author	Schagatay, Erika
Title	Naturlig bloddopning vid fysiologisk stress
Journal	Svensk idrottsforskning
Year/vol/no/pp	2004; 1; 18-21

Author	Ånell, Pär
Title	Bra kan bli bättre genom samarbete: antidoping
Journal	Svensk idrott
Year/vol/no/pp	2005; 1; 22-23

Author	Ånell, Pär
Title	Så säkras kvalitén i antidopingarbetet: antidoping
Journal	Svensk idrott
Year/vol/no/pp	2005; 1; 24-25

Author	Ånell, Pär
Title	Debutanter med rätt att testa
Journal	Svensk idrott
Year/vol/no/pp	2004; 9; 20-21

Articles published in international journals 2004-2007

Research in anti-doping

Author	de Hon O, Coumans B
Title	The continuing story of nutritional supplements and doping infractions
Journal	British Journal of Sports Medicine
Year/vol/no/pp	2007; 41; 800-805
Abstract	This paper highlights the issues arising from the use of nutritional supplements in relation to doping control. The authors draw attention to the risks associated with the use of untested supplements for athletes that can be subjected to doping control. In addition, they describe a quality system set up in The Netherlands to supply athletes with information about 'low-risk' dietary supplements. They also demonstrate the necessity for laboratory-based testing in addition to the HACCP procedures that are of utmost importance in ensuring the quality athletes expect. However, as stated in the article, additional efforts by governments, the industry and antidoping organisations have to be made to reduce (un)intentional malpractice in the supplement industry.

Author	The Economist
Title	Special Report: Ever farther, ever faster, ever higher? - Sport and drugs
Journal	The Economist
Year/vol/no/pp	2004; 372; 8387; 20-22
Abstract	There is every chance the 28th summer Olympiad, which opens in Athens on August 13th, will make headlines less for the joy of effort - and still less for good example or respect for universal ethics - than for athletes caught cheating with performance-enhancing drugs. The past year has brought plenty of evidence that doping is rife. In June 2003, a syringe containing a hitherto unknown and undetectable steroid, tetrahydrogestrinone (THG), was sent to America's Anti-Doping Agency (USADA), apparently by a disaffected coach. Speedily designed tests, some applied retrospectively to old urine samples, showed that use of THG had been widespread among top athletes. The drug was allegedly made by BALCO (the Bay Area Laboratory Co-operative), in California, as a nutritional supplement. BALCO's clients included many top sports stars, such as Tim Montgomery, Marion Jones, Shane Mosley, several members of the Oakland Raiders American football team, and Barry Bonds. Although some of these athletes deny using THG, others have already been banned from their sport for doing so.

Author	The Economist
Title	Finance And Economics: Reputational risk; Death and disgrace insurance
Journal	The Economist
Year/vol/no/pp	2005; 380; 8486; 82
Abstract	Head-butting, stamping, insults, feigning injury: in too many ways, the FIFA World Cup darkened the image of those who play the beautiful game. Football is not alone. Witness the allegations of doping that removed top cyclists from the Tour de France and the talk of performance-enhancing drugs that swirls around baseball. Errant stars may worry about more than just a ban from the field or the saddle. Some earn as much from endorsements as from competing, and sponsors dislike seeing their brands dragged down.

Author	Fraser, AD
Title	Doping control from a global and national perspective
Journal	Therapeutic Drug Monitoring
Year/vol/no/pp	2004; 26; 2; 171-174
Abstract	The practice of enhancing athletic performance through foreign substances was known from the earliest Olympic games. In 1967, the International Olympic Committee (IOC) established a Medical Commission responsible for developing a list of prohibited substances and methods. Drug tests were first introduced at the Olympic winter games in Grenoble and at the summer games in Mexico City in 1968. In February 1999, the IOC convened the World Conference on Doping in Sport in Lausanne, Switzerland. The Lausanne Declaration on Doping in Sport recommended creation of an International Anti-Doping Agency. The World Anti-Doping Agency (WADA) was formed in Lausanne, Switzerland on the basis of equal representation from the Olympic movement and public authorities. One of the mandates of WADA was to harmonize the Olympic antidoping code and develop a single code applicable and acceptable for all stakeholders. The world antidoping code developed by WADA included creation of several international standards (IS). The purpose of each IS was harmonization among antidoping organizations. The ISs were developed for laboratories, testing, the prohibited list, and for therapeutic use exemptions (TUE). The objective of this manuscript is to present a brief history of doping in sport and describe creation of WADA in 1999. The components of the World Anti-Doping code (in particular, the Therapeutic Use Exclusion program or TUE) is described. The WADA code defines a TUE as ”permission to use, for therapeutic purposes, a drug or drugs which are otherwise prohibited in sporting competition.” Experiences of the Canadian Centre for Ethics in Sport Doping Control Review Board are presented because this national TUE committee has been operational for over 12 years. The challenge of developing a rigorous global antidoping program requires acceptance of doping as a problem by sport organizations, athletes, and public authorities. Individual stakeholders must be prepared to preserve the values of sport, which means free from doping. This will require vigilance by all interested parties for the benefit of elite athletes and society overall.

Author	Haugen, Kjetil K.
Title	The performance-enhancing drug game
Journal	Journal of Sports Economics
Year/vol/no/pp	2004; 5; 1; 67-86

Author	Houlihan, Barrie
Title	Public Sector Sport Policy: Developing a Framework for Analysis
Journal	International Review for the Sociology of Sport
Year/vol/no/pp	2005; 40; 2; 163-185
Abstract	Despite the increasing involvement of governments in sport, and the high level of academic interest in sports-related public policy issues such as equity, doping, harassment and violence, there is remarkably little analysis of sport policy that utilizes the major models and frameworks for analysis widely adopted in other policy areas. Following the development of a set of criteria for assessing the adequacy of analytic frameworks, four major meso-level analytic frameworks are examined: the stages model, institutional analysis, multiple streams model, and the advocacy coalition framework. These are assessed for their internal coherence and applicability to the study of sport policy. None of the four frameworks reviewed is considered to be sufficiently persuasive and, consequently, a modified version of the advocacy coalition framework is developed and suggested as the most promising point of departure for the analysis of sport policy.

Author	Hunour, John W.
Title	The fight for fair play
Journal	Nature
Year/vol/no/pp	2004; 430; 6996; 143-
Abstract	The article deals with regulations in relations to WADA, and with the aims of doping controls. The article also discusses different doping scandals in history.

Author	Journal of Sport & Social Issues
Title	Drafting Kelli White
Journal	Journal of Sport & Social Issues
Year/vol/no/pp	2004; 28; 3; 219-
Abstract	The article supply information about different anti-doping control methods.

Author	Maughan RJ
Title	Contamination of dietary supplements and positive drug tests in sport
Journal	Journal of Sports Sciences
Year/vol/no/pp	2005; 23; 9; 883-889
Abstract	The use of dietary supplements is widespread in sport and most athletes competing at the highest level of competition use some form of dietary supplementation. Many of these supplements confer no performance or health benefit, and some may actually be detrimental to both performance and health when taken in high doses for prolonged periods. Some supplements contain excessive doses of potentially toxic ingredients, while others do not contain significant amounts of the ingredients listed on the label. There is also now evidence that some of the apparently legitimate dietary supplements on sale contain ingredients that are not declared on the label but that are prohibited by the doping regulations of the International Olympic Committee and of the World Anti-Doping Agency. Contaminants that have been identified include a variety of anabolic androgenic

steroids (including testosterone and nandrolone as well as the pro-hormones of these compounds), ephedrine and caffeine. This contamination may in most cases be the result of poor manufacturing practice, but there is some evidence of deliberate adulteration of products. The principle of strict liability that applies in sport means that innocent ingestion of prohibited substances is not an acceptable excuse, and athletes testing positive are liable to penalties. Although it is undoubtedly the case that some athletes are guilty of deliberate cheating, some positive tests are likely to be the result of inadvertent ingestion of prohibited substances present in otherwise innocuous dietary supplements.

Author	McHugh CM, Park RT, Sonksen PH, Holt RI.
Title	Challenges in detecting the abuse of growth hormone in sport
Journal	Clinical Chemistry
Year/vol/no/pp	2005; 51; 9; 1587-93
Abstract	*Background*: Growth hormone (GH) is reputed to be in widespread use in the sporting arena as a performance-enhancing agent and is on the list of banned substances published by the World Anti-Doping Agency. The detection of GH abuse poses many challenges. Unlike many substances of abuse, such as synthetic anabolic steroids, GH is a naturally occurring substance; therefore, demonstration of exogenous administration must rely on detecting concentrations in excess of an established reference interval. The purpose of this review is to discuss the methodologies being developed to detect GH abuse. *Methods*: We undertook a comprehensive search using multiple electronic databases and hand searches of reference lists of articles. The data for this review reflect our academic interests and experience through work on the GH-2000 and GH-2004 projects. *Results:* Two approaches have been taken to detect GH abuse. The first is based on assessment of the effect of exogenous GH on pituitary GH isoforms, and the second is based on measurement of markers of GH action. The advantages of each approach and the difficulties encountered with each technique, as well as future concepts in detection, are discussed. *Conclusion:* Although there are substantial challenges for the detection of GH, methodologies now exist to detect GH abuse with reasonable sensitivity and specificity.

Author	Ritter, Stephen K
Title	The dope on testosterone tests
Journal	Chemical & Engineering News
Year/vol/no/pp	2006; 84; 35; 43-45
Abstract	Now that the initial media feeding frenzy over the Floyd Landis Tour de France doping scandal has abated, it's time for a sober perspective on doping in sports. Landis won the world's premier cycling event last month. The urine sample he was required to give following that stage win on July 20 subsequently tested positive for an abnormal amount of testosterone. Urine and blood tests are analyzed for different sets of performance-enhancing drugs or agents to cover up drug use. The cutoff for a positive test for testosterone, set out in the antidoping code, is a testosterone to epitestosterone

	ratio (T/E) of 4:1 or higher. The public should not forget that the scientists conducting the doping tests are merely fact-finders. It's up to the sports-governing bodies, which include scientists on their review panels, to decide what to do with the facts. It's up to federal governments to more tightly regulate sports and enforce more severe punishments for violations.
Author	Staudohar Paul D
Title	Performance-enhancing drugs in baseball
Journal	Labor Law Journal
Year/vol/no/pp	2005; 56; 2; 139-149
Abstract	The scandal over steroids and other performance-enhancing drugs has shaken major league baseball to its foundations. From President Bush down to the smallest fan, the inquisition has refocused attention from the game itself to the integrity of its players. The sport badly needs to restore the public's confidence in the purity of competition. A step in this direction is the new drug testing program that was negotiated and approved by the owners and players for the 2005 season. It is far more comprehensive, intrusive, and punitive than the 2002 program that it replaced. Time will tell whether the new program will rid the sport of the blight which allows juiced-up players to achieve phony records that overshadow authentic accomplishments.
Author	Striegel H, Vollkommer G, Horstmann T, et al.
Title	Contaminated nutritional supplements - legal protection for elite athletes who tested positive: A case report from Germany
Journal	Journal of Sports Sciences
Year/vol/no/pp	2005; 23; 7; 723-726
Abstract	A significant proportion of nutritional supplements manufactured worldwide contain non-listed contaminations with anabolic-androgenic steroids (AAS), whose ingestion may lead to positive doping test results. This will lead to the suspension of, and sanctions against, the athlete, since this group of active substances is prohibited by the anti-doping code of the World Anti-Doping Agency as well as by sports associations not connected with this agency. Considerable financial losses are often the consequence for a banned athlete. Based on an amendment to the law governing the manufacture and prescription of drugs (AMG) in Germany in 1997 and an increasingly extensive interpretation of the term "drug" by the Federal Supreme Court, preparations containing anabolic steroids or their precursors are to be classified as drugs and, therefore, are subject to compulsory declaration as stated by the AMG. If this obligation is not adhered to, the result may be a claim for damages by the athlete against the manufacturer of a preparation, if the athlete took the preparation thinking it was harmless as judged by the Anti-Doping regulations, but was then found to be positive in doping tests. The judges in the first case before the county court in Stuttgart decided in favour of the claim for damages with respect to lost bonuses, loss of earnings and accrued legal costs by a soccer player who tested positive and was therefore suspended. Based on the evidence presented, the court came to the decision that

	the soccer player's positive test result was due to the ingestion of nutritional supplements containing non-listed AAS. This procedure could set a precedent for other states to demonstrate that athletes who had tested positive due to contaminated nutritional supplements are not without legal protection.
Author	Van Eenoo, Peter; Delbeke, Frans T.
Title	Reply to 'Measurement uncertainty and doping control in sport' by A. van der Veen, Accred Qual Assur (2003) 8:334-339
Journal	Accreditation and Quality Assurance
Year/vol/no/pp	2003; 8; 10; 477-479
Author	van der Veen, Adriaan M. H.
Title	Measurement uncertainty and doping control in sport
Journal	Accreditation and Quality Assurance
Year/vol/no/pp	2003; 8; 7-8, 334-339
Abstract	In a series of alleged cases of doping in sport, the assessment of (non-) compliance with an established threshold value has been under debate. From several cases witnessed, it has been concluded that the work of some of the laboratories responsible for doping control does not comply with present quality requirements, most notably those of ISO/IEC 17025. In all cases studied, the observed value is just above the threshold, and a credible statement of measurement uncertainty is lacking. National accreditation bodies should pay specific attention to the latter issue, as the uncertainty statement is part of the material evidence of a (alleged) doping offence, and, as such, an important integral part of the accreditation status of a laboratory and its scope. The fight against doping is based on proper concepts and principles, but it has been noted that in some cases practice does not always follow the requirements set by the system.
Author	van der Veen, Adriaan M. H.
Title	Measurement uncertainty and doping control in sport. Part 2: Metrological traceability aspects
Journal	Accreditation and Quality Assurance
Year/vol/no/pp	2004; 9; 6; 311-316
Abstract	The assessment of (non-)compliance in doping control and in particular the appreciation of uncertainty of measurement in such an assessment has become a subject of debate. In a previous paper, the requirements for evaluating measurement uncertainty have been addressed. The debate now focuses on the estimation of the standard uncertainty. The completeness of an uncertainty budget is discussed in view of the (metrological) traceability of the result. It is concluded that despite the fact that the new doping rules dictate that A-tests and B-tests be performed in the same laboratory, the uncertainty budget should encompass all factors, including between-laboratory effects. The assessment of (non-)compliance should be based on a one-sided t -test. There is also consensus about the level of confidence to be applied (99%), despite the fact that the regulations state 95% as the appropriate level.

Social science

Author	Brissonneau, C.; Le Noe, O.
Title	The recognition of a medical specialty and the construction of the public issue ''dope in sports''
Journal	Sociologie du Travail
Year/vol/no/pp	2006; 48; 4; 487-508
Abstract	The formation of a professional specialty - sports medicine - is described with emphasis on how drug abuse has become a public issue. This notion's itinerary is traced between 1955 and 1999 so as to show how doctors with different profiles and activities successively raised the issue of ''doping''. The objectives of medicine, as it was being applied to sports, gradually changed. At the start, the intention was to cure, a view that celebrated the virtues of practicing a sport and it condemned using drugs. A new field of medical competence was opened with the ''biological preparation of performances'', which, though presented as an alternative to using drugs, blurred the boundaries with doping. Medical positions became polarized: on the one side, a science of training took shape around the physiology of physical efforts, which made it possible to intensify activities while optimizing them thanks to rest periods; and on the other side, clinicians who, in closer contact with the everyday life of players, both understood the requirements ensuing from a continuous renewal of performances and tended to favor taking ''products'' for ''curative'' purposes. Sports medicine was legitimated as a medical specialty on two grounds: the one, obvious, sets doping at odds with health; and the other, aberrant from the viewpoint of health but nonetheless accepted, associates intensive sports with health.

Author	Brissonneau, C.
Title	Le dopage dans le cyclisme professionnel au milieu des années 1990 : une reconstruction des valeurs sportives
Journal	Déviance et Société
Year/vol/no/pp	2007; 31; 2
Abstract	The analysis of stories of life of five doped, professional cyclists during the 1990s updates, through the notion of career, a progressive registration of the dopantes practices in the career of the cyclists, those, going together with a greater rationalization of the procedures of training. The progressive gliding of the individuals of the common world to the extraordinary high-level one, brings these doped cyclists not to feel as such. Following the example of the collective process of the abnormality shown by H.S Becker, the pharmacological evolution as well as the fall of the system of standards in health, and in ethics are the result of the numerous interactions with the peers cyclist, leaders but also the doctors of the sport who supervise them.

Author	Cavanagh, S L; Sykes, H
Title	Transsexual bodies at the Olympics: The International Olympic Committee's policy on transsexual athletes at the 2004 Athens summer games
Journal	Body & Society
Year/vol/no/pp	2006; 12; 3; 75-
Abstract	The International Olympic Committee (IOC) has always been plagued by what queer theorist Judith Butler calls gender trouble. In 2000, the IOC discontinued their practice of sex-testing because medical

	experts could not agree on what defined a genetic female and so an adequate medical testing measure could not be found. In response to outside pressure, the IOC adopted a policy enabling transsexual athletes to compete in the 2004 Olympic Games. This article argues that the IOC policy on sex reassignment does not operate to guard against discrimination and harassment against transsexual athletes but that it operates to maintain the popular illusion that there are two, binary gender designations. While both transsexual and Olympic bodies have unique histories and vastly different experiences in the social and political realms, using psychoanalysis we contend that the need to test gendered bodies is incited by an anxiety about bodily deterioration, aging, and, ultimately, mortality.
Author	Park, Jin-Kyung
Title	Governing Doped Bodies: The World Anti-Doping Agency and the Global Culture of Surveillance
Journal	Cultural Studies – Critical Methodologies
Year/vol/no/pp	2005; 5; 2; 174-188
Abstract	This essay examines the governing practices of the World Anti-Doping Agency (WADA), an organization established in 1999 to cope with the crisis of illicit performance-enhancing drug use in international sport. The background, structure, and policies of WADA are analyzed while reflecting upon recent cultural studies debates on governmentality. In doing so, it is shown how WADA policies fundamentally work to police athletic bodies. Also demonstrated is that WADA embodies a First World, technology-driven governance of doping.
Author	Peretti-Wetel, Patrick; Guagliardo, Valerie; Verger, Pierre; Mignon, Patrick; Pruvost, Jacques; Obadia; Yolande
Title	Attitudes Toward Doping and Recreational Drug Use Among French Elite Student-Athletes
Journal	Sociology of Sport Journal
Year/vol/no/pp	2004; 21; 1; 1-17
Abstract	This study examines 458 elite-athletes (ESA:s) in France in the group of 16 to 24 years. Is there any relationship between use of doping and use of cigarettes, alcohol or cannabis? Most common is the use among older students with parents with lower academic merits and/or parents without experience in sports. The analyse builds on sociological theories about deviant behaviour. The authors argue that the students obtain legitimate ends with non-legitimate means, but in the end they try rationalise their behaviour.

Behavioural science

Author	Alaranta A, Alaranta H, Holmila J, et al.
Title	Self-reported attitudes of elite athletes towards doping: differences between type of sport
Journal	International Journal of Sports Medicine
Year/vol/no/pp	2006; 27; 10; 842-846
Abstract	Although athletes' beliefs and values are known to influence whether or not an athlete will use banned drugs, little is known about the athletes' beliefs and attitudes in different sports. The aim of this study was to clarify the beliefs and attitudes of elite athletes towards banned substances and methods in sports. A total of 446 athletes (response rate

	90.3%; 446/494) financially supported by the National Finnish Olympic Committee completed a structured questionnaire during their national team camps in 2002. More than 90% of the athletes reported to believe that banned substances and methods have performance enhancing effects, and 30% reported that they personally know an athlete who uses banned substances. Of the male athletes 35%, and 23% of females reported they personally know an athlete using banned substances. A total of 15% of the athletes reported that they had been offered banned substances: 21% of the speed and power athletes, 14% of the team sport athletes and of the athletes in motor skills demanding events, and 10% of the endurance athletes. Stimulants were the most often offered substance group (to 7% of all the athletes) followed by anabolic steroids (4%). Subjects who regarded doping as a minor health risk seemed to be more often associated with doping users than those regarding doping as a significant health risk. Athletes in different sports have a different approach to doping. Risk of doping appears to be highest in speed and power sports and lowest in motor skills demanding sports. Males are at higher risk than females. Controlling doping only by tests is not sufficient. A profound change in the attitudes is needed, which should be monitored repeatedly.
Author	Amtmann, JA
Title	Self-reported training methods of mixed martial artists at a regional reality fighting event
Journal	Journal of Strength and Conditioning Research
Year/vol/no/pp	2004; 18; 1; 194-196
Abstract	This study surveyed 28 athletes competing at a regional mixed martial arts (MMA) event. The survey attempted to gather information regarding overall training volume, supplement use, and specific exercises used. The survey return rate was 100% (28/28). Twenty-five out of the 28 athletes supplemented their training with strength training. Overall frequency of strength training sessions/week ranged from 1-7, and overall frequency of fighting specific training sessions/week ranged from 3-12. Five out of the 28 athletes used/had used anabolic-androgenic steroids. Twelve of the MMA athletes did not perform exercises specifically for the neck musculature, and only 8 used the power clean and/or power snatch within their strength-training program. The results suggest that strength and conditioning specialists should educate MMA athletes regarding the importance of balanced training, effective exercises, and the side effects of anabolic androgenic steroid use.
Author	Cole, Jon C.; Smith, Rachel; Halford, Jason C. G.; Wagstaff, Graham F.
Title	A preliminary investigation into the relationship between anabolic-androgenic steroid use and the symptoms of reverse anorexia in both current and ex-users
Journal	Psychopharmacology
Year/vol/no/pp	2003; 166; 4; 424-429
Abstract	Rationale. To establish whether the symptoms of reverse anorexia continue with the cessation of anabolic-androgenic

	steroid (AAS) use in male body builders. *Objective:* To determine whether current and ex-AAS-using body builders score higher on the modified (for reverse anorexia) eating disorders inventory (EDI) than both non-AAS-using body builders and regular aerobic exercisers. *Methods:* A random sample of regular aerobic exercisers, current, ex-, and non-AAS-using body builders were recruited from four local gyms and a syringe exchange in the Merseyside area. A total of 137 male subjects with an average age of 29 years (range 17-49 years) were recruited. Fifty subjects were classed as aerobic exercisers, 39 subjects were classed as non-AAS-using body builders, 29 subjects were current. AAS users and 19 subjects were ex-AAS users. All subjects undertook an anonymous questionnaire consisting of the modified EDI, the severity of dependence scale (SDS) for both exercising and AAS use, and questions about body weight, dieting, and substance use. *Results:* AAS-using body-builders were striving towards an exaggerated mesomorphic physique. Both current and ex-AAS users had higher scores on all sections of the EDI than both groups of non-AAS users. There was a significant positive correlation between the SDS scores for AAS and cores on the EDI for current AAS users. *Conclusions:* AAS use, but not body building per se, was associated with increased symptoms of reverse anorexia, and this symptomatology was higher in those who had higher scores on the SDS for AAS. It remains to be determined whether symptoms of reverse anorexia are either a cause or an effect of AAS use.
Author	De Micheli, Denise; Formigoni, Maria Lucia O. S.
Title	Research Report – Drug use by Brazilian students: associations with family, psychosocial, health, demographic, and behavioural characteristics
Journal	Addiction
Year/vol/no/pp	2004; 99; 5; 570-
Abstract	This is a study of the drug habits among Brasilian students in relation to different factors. 0.1% did use steroids.
Author	Dodge TL, Jaccard JJ
Title	The effect of high school sports participation on the use of performance-enhancing substances in young adulthood
Journal	Journal of Adolescent Health
Year/vol/no/pp	2006; 39; 3; 367-373
Abstract	*Purpose:* The present study examined the relationship between high school sports participation and the use of anabolic steroids (AS) and legal performance-enhancing dietary supplements in young adulthood. Additionally, the relationship between the use of AS and legal dietary supplements was explored. *Methods:* Data on approximately 15,000 adolescents from the National Longitudinal Study of Adolescent Health were used. School sports participation was assessed when adolescents were in grades 7-12. AS use and legal performance-enhancing dietary supplement use were assessed six years later. *Results:* Males were more likely than females to use AS and legal supplements. A sport by gender interaction emerged for

	the use of AS, indicating that the gender differences in AS use were greater for those who participated in sports during high school. High school sports participation was associated with increased likelihood that adolescents would use legal supplements in young adulthood. Finally, there was a positive relationship between the use of legal dietary supplements and AS use. *Conclusions:* This study highlights the important role that the social environment during adolescence has on future health behaviors. Results suggest that the sporting context experienced during early adolescence may have lasting effects on the use of performance-enhancing substances. The use of legal performance-enhancing dietary supplements appears to be more prevalent than the use of AS, and there seems to be a positive relationship between the use of AS and legal performance-enhancing dietary supplements.
Author	Goldfield GS, Blouin AG, Woodside DB
Title	Body image, binge eating, and bulimia nervosa in male bodybuilders
Journal	Canadian Journal of Psychiatry-revue Canadienne de Psychiatrie
Year/vol/no/pp	2006; 51; 3; 160-168
Abstract	*Objective:* Male bodybuilders (MBB) exhibit more severe body dissatisfaction, bulimic eating behaviour, and negative psychological characteristics, compared with male athletic and nonathletic control subjects, but few studies have directly compared MBB and men with eating disorders. This study compared men with bulimia nervosa (MBN), competitive male bodybuilders (CMBB), and recreational male bodybuilders (RMBB) on a broad range of eating attitudes and behaviours and psychological characteristics to more accurately determine similarities and differences among these groups. *Method:* Anonymous questionnaires, designed to assess eating attitudes, body image, weight and shape preoccupation, prevalence of binge eating, weight loss practices, lifetime rates of eating disorders, anabolic androgenic steroid (AAS) use, and general psychological factors, were completed by 22 MBN, 27 CMBB, and 25 RMBB. *Results:* High rates of weight and shape preoccupation, extreme body modification practices, binge eating, and bulimia nervosa (BN) were reported among MBB, especially among those who competed. CMBB reported higher rates of binge eating, BN, and AAS use compared with RMBB, but exhibited less eating-related and general psychopathology compared with MBN. Few psychological differences were found between CMBB and RMBB. *Conclusions*: MBB, especially competitors, and MBN appear to share many eating-related features but few general psychological ones. Longitudinal research is needed to determine whether men with a history of disordered eating or BN disproportionately gravitate to competitive bodybuilding and (or) whether competitive bodybuilding fosters disordered eating, BN, and AAS use.

Author	Hall, RCW; Chapman, MJ
Title	Psychiatric complications of anabolic steroid abuse
Journal	Psychosomatics
Year/vol/no/pp	2005; 46; 4; 285-290
Abstract	The authors review the literature from human and animal studies on the neurochemical and pathological psychiatric effects of supraphysiological doses of anabolic-androgenic steroids (AAS) and discuss the AAS use and abuse patterns, additional drug use patterns, and personality and behavioral characteristics of AAS abusers.

Author	Hildebrandt, Tom; Langenbucher, James; Carr, Sasha; et al.
Title	Predicting intentions for long-term anabolic-androgenic steroid use among men: A covariance structure model
Journal	Psychology of Addictive Behaviors
Year/vol/no/pp	2006; 20; 3; 234
Abstract	Long-term use of anabolic-androgenic steroids (AASs) is associated with both positive and negative effects. The authors examined possible mechanisms by which these effects contribute to AAS satisfaction and predict intentions for future AAS use. Five hundred male AAS users completed an interactive Web-based instrument assessing the psychological and physical effects of AAS use. Covariance structure modeling was used to evaluate both direct and indirect effects of AAS consequences on satisfaction with AASs and intentions for future AAS use. Results suggest that gain in muscle mass and psychological benefits from AAS use uniquely contributed to both AAS satisfaction and intentions for future use. Side effects from AAS use also uniquely contributed to AAS satisfaction, but ancillary drug use was found to partially mediate this relationship, suggesting that the satisfaction of experienced AAS users is enhanced by their mastery of side effects through the use of ancillary drugs. The final model explained 29% of the variance in intentions for future AAS use. Mechanisms for sustained AAS use and implications for intervention and prevention strategies are discussed.

Author	Hildebrandt T, Schlundt D, Langenbucher J, et al.
Title	Presence of muscle dysmorphia symptomology among male weightlifter
Journal	Comprehensive Psychiatry
Year/vol/no/pp	2006; 47; 2; 127-135
Abstract	Limited research exists on muscle dysmorphia (MD) in men and in nonclinical populations. The current study evaluated types of body image disturbance among 237 male weightlifters. Latent class analysis of 8 measures of body image disturbance revealed 5 independent types of respondents: Dysmorphic, Muscle Concerned, Fat Concerned, Normal Behavioral, and Normal. One-way analysis of variance of independent measures of body image disturbance and associated psychopathology confirmed significant differences between groups. The Dysmorphic group reported a pattern of body image disturbance consistent with MID by displaying a high overall level of body image disturbance, symptoms of associated psychopathology, steroid use, and appearance-controlling behavior. Findings generally supported classifying MD as

	a subtype of body dysmorphic disorder and an obsessive-compulsive spectrum disorder. Implications for studying body image disturbance in male weightlifters, and further evaluation of the MD diagnostic criteria are discussed.
Author	Kanayama G, Cohane GH, Weiss RD, et al.
Title	Past anabolic-androgenic steroid use among men admitted for substance abuse treatment: An underrecognized problem?
Journal	Journal of Clinical Psychiatry
Year/vol/no/pp	2003; 64; 2; 156-160
Abstract	*Background*: Recent reports suggest that anabolic-androgenic steroids (AAS) may cause mood disorders or dependence syndromes and may help to introduce some individuals to opioid abuse. At present, however, little is known about prior AAS use among men entering inpatient substance abuse treatment. *Method:* We assessed lifetime AAS use in 223 male substance abusers admitted to a substance abuse treatment unit primarily for treatment of alcohol, cocaine, and opioid dependence. Subjects reporting definite or possible AAS use were then asked to participate in a detailed semi-structured interview that covered demographics, drug use history, and symptoms experienced during AAS use and withdrawal, and whether AAS use had helped introduce the subject to other classes of drugs. *Results:* Twenty-nine men (13%) reported prior AAS use, but this history was documented on physicians' admission evaluations in only 4 cases. Among 88 men listing opioids as their drug of choice, 22 (25%) acknowledged AAS use, versus only 7 (5%) of the other 135 men ($p < .001$). Twenty-four (83%) of the 29 AAS users were interviewed in detail. Seven (29%) of the men interviewed, all with opioid dependence, reported that they first learned about opioids from friends at the gym and subsequently first obtained opioids from the same person who had sold them AAS. Eighteen (75%) of the men interviewed 7 reported that AAS were the first drugs that they had ever self-administered by injection, 4 (17%) reported severe aggressiveness or violence during AAS use, 1 (4%) attempted suicide during AAS withdrawal, and 5 (21%) described a history of AAS dependence. *Conclusion:* Prior AAS use appears to be common but underrecognized among men entering inpatient substance abuse treatment, especially those with opioid dependence. AAS use may serve as a "gateway" to opioid abuse in some cases and may also cause morbidity in its own right.
Author	Kanayama G, Barry S, Hudson JI, et al.
Title	Body image and attitudes toward male roles in anabolic-androgenic steroid users
Journal	American Journal of Psychiatry
Year/vol/no/pp	2006; 163; 4; 697-703
Abstract	*Objective:* The authors sought to expand on previous observations suggesting that body-image pathology is associated with illicit use of anabolic-androgenic steroids (AAS). In particular, the authors compared current versus past AAS users and short-term versus long-term users in this respect. *Method:* The authors asses-

sed 89 heterosexual men who lifted weights regularly -48 AAS users and 41 nonusers-on measures of self-esteem, attitudes toward male roles, body image, eating-related attitudes and behaviors, and muscle dysmorphia (”reverse anorexia nervosa”).
Results: AAS users as a whole showed few differences from nonusers on most measures but showed greater symptoms of muscle dysmorphia (e. g., not allowing their bodies to be seen in public, giving up pleasurable activities because of body-appearance concerns). The current and past AAS users each differed only modestly from nonusers on most measures. Short-term AAS ”experimenters” were also largely indistinguishable from nonusers, but the long-term AAS users showed striking and significant differences from nonusers on many measures, including marked symptoms of muscle dysmorphia and stronger endorsement of conventional male roles.
Conclusions: Both body-image pathology and narrow stereotypic views of masculinity appear to be prominent among men with long-term AAS use. Although our cross-sectional observations cannot confirm that these factors help to cause or perpetuate AAS use, a causal hypothesis is certainly plausible and deserving of further testing in longitudinal studies. If these factors are indeed causal, then AAS users might respond to cognitive behavior approaches that simultaneously take aim at both types of maladaptive beliefs.

Author	Keane, H.
Title	Diagnosing the male steroid user: drug use, body image and disordered masculinity
Journal	Health
Year/vol/no/pp	2005; 9; 2; 189-208
Abstract	As steroid use has gained prominence as a dangerous form of substance abuse, two main sets of discourses have been deployed to investigate and ameliorate this emerging public health threat. This article examines these two discursive frameworks and their constitution of the male steroid user as psychologically disordered, drawing on a range of medical and psychological literature. The first framework understands steroid use as a form of illicit drug use, and constitutes the steroid user as an antisocial and excessively masculine subject. The second locates steroid use within the field of body image disorder, producing the steroid user as a damaged and feminized male, a vivid example of masculinity in crisis. Both of these approaches tend to elide the specificity of steroid use and its associated bodily practices in their eagerness to form it into an easily comprehended entity which can be targeted by medical and legal governance.

Author	Klotz F, Garle M, Granath F, et al.
Title	Criminality among individuals testing positive for the presence of anabolic androgenic steroids
Journal	Archives of General Psychiatry
Year/vol/no/pp	2006; 63; 11; 1274-1279
Abstract	*Context:* Observations suggest that the use of anabolic androgenic steroids (AAS) may trigger uncontrolled, violent rage. Other observations indicate that certain groups of criminals may use AAS with the intention of being capable of committing

crime more efficiently.
Objective: To examine the proposed association between the use of AAS and criminality.
Design: A controlled retrospective cohort study of registered criminal activity among individuals tested for AAS use during the period of January 1, 1995, to December 31, 2001.
Setting: All individuals in Sweden who were tested for AAS use during this period. These individuals were referred for testing from both inpatient and outpatient clinics as well as from centers for treatment of substance abuse.
Participants: Individuals testing positive for AAS (n= 241), with those testing negative for AAS during the same period (n= 1199) serving as the control group.
Main Outcome Measures: The ratios (expressed as relative risk [RR]) of the incidences of several categories of crime in the 2 study groups.
Results: The risk of having been convicted for a weapons offense or fraud was higher among individuals testing positive for AAS than among those testing negative (RR, 2.090 and 1.511, respectively; 95% confidence interval [CI], 1.589-2.749 and 1.208-1.891, respectively) whereas there were no significant differences with respect to violent crimes (RR, 1.116; 95% CI, 0.981-1.269) or crimes against property (RR, 0.942; 95% CI, 0.850-1.044). When patients referred from substance abuse centers were excluded, a lower risk for crimes against property was observed for the individuals who tested positive for AAS (RR, 0.761; 95% CI, 0.649-0.893) and the risk for fraud in the 2 groups was equalized (RR, 1.117; 95% CI, 0.764-1.635). The increased risk for a weapons offense among the individuals testing positive for AAS remained virtually unchanged.
Conclusions: In addition to the impulsive violent behavior previously shown to be related to AAS use, such use might also be associated with an antisocial lifestyle involving various types of criminality. However, the existence and nature of this possible association remain unclear and call for further investigation.

Author	Laure, P; Binsinger, C; Lecerf, T
Title	General practitioners and doping in sport: attitudes and experience
Journal	British Journal of Sports Medicine
Year/vol/no/pp	2003; 37; 4; 335-338
Abstract	*Objectives*: To examine the attitudes to, and knowledge of, doping in sport of French general practitioners (GPs), and their contact with drug taking athletes on an everyday basis. *Methods:* A total of 402 GPs were randomly selected from all over France and interviewed by telephone, using a prepared script. *Results:* The response rate was 50.5% (153 men and 49 women; mean (SD) age 45.6 (5.6) years). Of the respondents, 73% confirmed that they had the list of banned products, and only 34.5% stated that they were aware of the latest French law, brought into effect in March 1999, concerning the fight against doping. Some 11% had directly encountered a request for prescription of doping agents over the preceding 12 months (the requested sub-

	stances were mainly anabolic steroids, stimulants, and corticosteroids), and 10% had been consulted by an athlete who was using doping drugs and was frightened of the health risks (the substances used were mainly anabolic steroids). Over half (52%) of the GPs favoured the prescription of drug substitutions to athletes who used doping agents. According to 87.5% of respondents, doping is a public health problem, and 80% stated that doping is a form of drug addiction. Most (89%) said that a GP has a role to play in doping prevention, but 77% considered themselves poorly prepared to participate in its prevention. *Conclusion:* The results suggest that (a) GPs have limited knowledge of doping and (b) are confronted with doping in their daily practice, at least occasionally.
Author	Laure, P; Binsinger, C
Title	Adolescent athletes and the demand and supply of drugs to improve their performance
Journal	Journal of Sports Science and Medicine
Year/vol/no/pp	2005; 4; 3; 272-277
Abstract	The aim of this study was to gather information into the principal methods and means employed to supply adolescents with doping agents and others substances used to improve their sporting performance. We conducted a nation wide study in France among adolescent athletes, using a self-completed questionnaire. Exploitable questionnaires (n = 6402) were returned, corresponding to 48.9% for the girls and 51.1% for the boys, both aged on average from 16.1 +/- 2.2 years. These adolescents practise on average 10.0 +/- 5.2 hours of sport per week. 21.9% participate on a national or international competition level. Of our respondents, 4.0% (95% confidence interval: 3.5%-4.5%) say they have been enticed into using products which are prohibited for athletes. 10.3% of the adolescents say that they have received substances to improve their performance at least once from an average of two different people. It was mostly a friend, their parents and the family doctor. On average, in 33.2% of the cases, the adolescent received the product without asking for it, and in nearly half the cases (46.6%), the adolescent paid for the product. We feel that it is necessary to better understand the ways in which this black market functions: for example; the initial sources of the products sold, the number and the 'profiles' of the dealers, the general organisation of the market and the sums of money involved.
Author	Laure, P.; Le Scanff, C.; Binsinger, C.
Title	Adolescent athletes and the demand and supply of drugs to improve their performance
Journal	Science & Sports
Year/vol/no/pp	2005; 20; 4; 168-170
Abstract	*Introduction:* - Little is known about the main methods and means employed to supply adolescents with doping agents and others substances used to improve their sporting performance. Main facts. - A study in France among all the adolescent of the 'Union nationale du sport scolaire', using a self-completed questionnaire, furnished 6402 exploitable questionnaires, corresponding

	to 48.9% for the girls and 51.1% for the boys, both aged on average from 16.1+/-2.2 years. These adolescents practise on average 10.0+/-5.2 hours of sport per week. 21.9% participate on a national or international competition level. Of our respondents, 4.0% said they had been enticed into using products, which are prohibited for athletes. 10.3% of the adolescents stated that they had received substances to improve their performance at least once from an average of two different people. It was mostly a friend, their parents and the family doctor. In nearly half the cases (46.6%), the adolescent paid for the product. *Conclusion:* - It is necessary to better understand the ways in which this black market functions: for example; the initial sources of the products sold, the number and the 'profiles' of the dealers, the general organisation of the market and the sums of money involved.
Author	Millman RB, Ross EJ
Title	Steroid and nutritional supplement use in professional athletes
Journal	American Journal on Addictions
Year/vol/no/pp	2003; 12; 48-54 (Suppl. 2)
Abstract	The use of performance-enhancing substances by athletes is nearly as old as sport itself. There are two primary categories of substances available to modern athletes: anabolic androgenic steroids (AAS) and nutritional supplements. All AAS and many of the nutritional supplements are used to increase testosterone levels in the body, thereby enhancing the athlete's ability to build lean muscle mass. Other nutritional supplements are used to increase the amount of energy available for workouts or competition. Although steroids are available in the U.S. via physician prescription, nutritional supplements are widely available to all consumers with relatively scant regulation. Steroids are associated with a variety of side effects that can lead to physical changes, psychological disturbances, morbidity, and even mortality. The side effects of nutritional supplements are not as well studied but are presumed to be similarly dangerous. However, for many athletes at all levels facing pressure to excel, the potential benefits of taking these substances appear to be outweighing the associated risks. Increased testing at all levels is recommended.
Author	Özdemir, L; Nur, N; Bagcivan, I; et al.
Title	Doping and performance enhancing drug use in athletes living in Sivas, mid-Anatolia: A brief report
Journal	Journal Of Sports Science and Medicine
Year/vol/no/pp	2005; 4; 3; 248-252
Abstract	The aim of this study was to determine the rate of doping and performance enhancing drug use in athletes in Sivas, Turkey, and to analyze the main reasons for the use. This was a cross-sectional study based on a self-report questionnaire. The subjects filled the questionnaires under the supervision of the investigators during interviews. This questionnaire included 24 items describing the population in terms of demographics, sport practice, doping in sport and substance use. Moreover, we assessed the frequency of

	doping drug use. The number of respondents was 883, of which 433 athletes and 450 healthy non-athletes (control group). The mean age of the total volunteers was 21.8 +/- 3.7 yrs. The male and female ratios were 78.2% and 21.8% respectively. Doping and performance enhancing drug usage rate was 8.0% (71 cases in 883 subjects). Doping drug use among the athletes was significantly ($p < 0.05$) higher (14.5%) compared with the non-athletes (1.8%). The agents used were anabolic steroids in 60.5%, l-carnitene in 12.7%, erythropoietin in 5.4%, Na-bicarbonate in 11.3% and creatinine in 14.1% of 71 cases. The reasons for doping use were to have a better body condition in 34 cases (47.9%) and to solve weight (gaining or loosing) problems in 8 (11.3%) cases. Since the potential side effects of doping drugs are not satisfactorily familiar to the most users, the education of athletes on the matter must be a top priority.
Author	Pagonis, T.A.; Angelopoulos, N.V.; Koukoulis, G.N.; Hadjichristodoulou, C.S.; Toli, P.N.
Title	Psychiatric and hostility factors related to use of anabolic steroids in monozygotic twins
Journal	European Psychiatry
Year/vol/no/pp	2006; 21; 8; 563-569
Abstract	*Introduction:* - Anabolic androgenic steroids (AAS) are derived by chemical manipulation of the testosterone molecule. The specified category of drugs produces anabolic, androgenic and psycho-active effects including elevated aggressive, hostile, violent and anti social behavior. *Objective:* - The objective of this case report observational study was to evaluate the possible psychological consequences of AS use in the twin user of each pair, compared with the non-user twin. *Methodology:* - We studied two pairs of male monozygotic twins: one pair 24 years old and the other 31 years old, with absolute genome and phenotype similarity. One of the twins of each pair used AAS while the other did not. Both pairs lived in Hellenic provincial towns and followed a common training and nutrition regime. The psychometric instruments used were the Symptoms Check List-90 (SCL-90) and the Hostility and Direction of Hostility Questionnaire (HDHQ). The psychometric evaluations took place within a time interval of 6 months. *Results:* - The study found high levels of aggressiveness, hostility, anxiety and paranoid ideation in the twins who used AS. The non-user twins showed no deviation from their initial status. *Conclusion:* - The use of AAS induced several important psychiatric changes in monozygotic twins which were not present in the twin who did not use AAS.
Author	Parkinson AB, Evans NA
Title	Anabolic androgenic steroids: A survey of 500 users
Journal	Medicine and Science in Sports And Exercise
Year/vol/no/pp	2006; 38; 4; 644-651
Abstract	*Purpose:* The use of anabolic androgenic steroids (AAS) to increase muscle size and strength is widespread. Information regarding self-administered AAS used nonmedically to enhance athletic performance or improve physical

appearance is sparse and poorly documented. The purpose of this study is to identify current trends in the drug-taking habits of AAS users.
Methods: An anonymous self-administered questionnaire was posted on the message boards of Internet Web sites popular among AAS users.
Results: Of the 500 AAS users who participated in the survey. 78 4% (392/500) were non-competitive bodybuilders and nonathletes; 59.6% (298/500) of the respondents reported using at least 1000 mg of testosterone or its equivalent per week
The majority (99 2%) of AAS users (496/500) self-administer injectable AAS formulations, and up to 13% (65/500) report unsafe injection practices such as reusing needles, sharing needles, and sharing multidose vials. In addition to using AAS, 25% of users admitted to the adjuvant use of growth hormone and insulin for anabolic effect. and 99.2% (496/500) of users reported subjective side effects from AAS use.
Conclusions: This survey reveals several trends in the nonmedical use of AAS Nearly four out of five AAS users are nonathletes who take these drugs for cosmetic reasons. AAS users in this sample are taking larger doses than previously recorded, with more than half of the respondents using a weekly AAS dose in excess of 1000 mg. The majority of steroid users self-administer AAS by intramuscular injection. and approximately I in 10 users report hazardous injection techniques. Polypharmacy is practiced by more than 95% of AAS users. with one in four users taking growth hormone and insulin. Nearly 100% of AAS users reported subjective side effects.

Author	Peretti-Watel, P.; Pruvost, J.; Guagliardo, V.; Guibbert, L.; Verger, P.; Obadia, Y.
Title	Attitudes toward doping among young athletes in Provence
Journal	Science & Sports
Year/vol/no/pp	2005; 20; 1; 33-40
Abstract	*Objective:* - This study examined attitudes toward doping and their correlates among elite athletes in South-Eastern France. *Method:* - Overall, 1,197 young elite athletes aged 16-24 were asked to participate. They were recruited in sporting public centres, in training centres depending on professional football and basketball clubs, and during courses organised by regional federations for their best athletes. Data were collected with a self-administered anonymous questionnaire. We used a cluster analysis in order to summarize attitudes toward doping in contrasted profiles. *Results:* - Among the initial sample, 996 young athletes agreed to participate (response rate 83%). We found a consensus among respondents concerning negative aspects of doping (dishonest, unhealthy and hazardous because of sanctions, for 95.2% of them). However, the cluster analysis showed that 52.8% of participants were prone to agree with a variety of statements dealing with sportive or non-sportive benefits of doping. This attitude was linked to motives to do sport, and it was more prevalent among males, older respondents, those practising an individual sport without

contact (such as athletics or cycling), and those registered in a training centre depending on a professional club. *Conclusion:* - Information and preventive actions targeting young athletes should focus more on anticipated benefits of doping, because this population seems already well aware of deleterious consequences of doping. Such actions should also take into account the variety of such anticipated benefits, which can be sportive as well as non-sportive.

Author: Petersson, A.; Garle, M.; Granath, F.; Thiblin, I.
Title: Morbidity and mortality in patients testing positively for the presence of anabolic androgenic steroids in connection with receiving medical care
Journal: Drug and Alcohol Dependence
Year/vol/no/pp: 2006; 81; 3; 215-220
Abstract: Observations by health-care professionals suggest that the use of anabolic androgenic steroids (AAS) may be associated with lethal complications, but this has not yet been confirmed by controlled epidemiological studies. Here, we investigated the diagnoses (in the Swedish patient care records) and mortality rate among patients who tested positively for the presence of AAS (n=248) in connection with receiving medical care. Patients who had tested negatively (n=1215) were used for comparison. The proportions of patients who had received institutionalized care for substance abuse, psychiatric disorder or central thoracic pain were significantly higher in the AAS-positive subjects (RR=2.2, 95% CI=1.2-4.2; RR=2.1, 95% CI=1.4-3.2 and RR=3.5, 95% CI=1.1-10.9, respectively). Furthermore, unspecified convulsions were highly over-represented in the AAS-positive group (RR=53.9, 95% CI=7.0-415.7) and one of these patients died during a seizure. The standardized mortality ratios (SMR) in the AAS-positive patients and -negative patients were 20.43 (95% CI=10.56-35.70) and 6.02 (95% CI=3.77-9.12), respectively. The relatively higher SMR in the AAS-positive patients was observed irrespective of what type clinic had referred the patients for AAS testing. In conclusion, use of AAS appears to be an indicator of increased risk for premature death in several categories of patients. However, the nature of the association between AAS and premature death remains unclear and additional research on this question is urgently required.

Author: Petersson, A.; Garle, M.; Holmgren, P.; Druid, H.; Krantz, P.; Thiblin, I.
Title: Toxicological findings and manner of death in autopsied users of anabolic androgenic steroids
Journal: Drug and Alcohol Dependence
Year/vol/no/pp: 2006; 81; 3; 241-249
Abstract: With the aim to characterize patterns in toxicological profile and manner of death in deceased users of anabolic androgenic steroids (AAS), a retrospective autopsy protocol study of 52 deceased users of AAS was undertaken. The AAS users were compared to 68 deceased users of amphetamine and/or heroin who were consecutively tested and found to be negative for AAS. Use of AAS was in the majority of cases (79%) associated with

	concomitant use of psychotropic substances. AAS-related deaths differed in several respects from deaths among users of heroin or amphetamine, most strikingly with regard to: (a) the median age at death, which was significantly lower for AAS users (24.5 years) than for users of heroin and/or amphetamine (34 and 40 years, respectively); (b) the manner of death, with AAS users dying significantly more often from homicide or suicide than users of other drugs; and (c) the body mass index (BMI), with AAS users exhibiting significantly higher BMI than users of other drugs. These results support the earlier reported association between use of AAS and use of other psychoactive substances. In addition, the data suggest that AAS users are more likely to become involved in incidents leading to violent death and have a higher risk of dying at a younger age than users of other drugs.
Author	Rachon D, Pokrywka L, Suchecka-Rachon K
Title	Prevalence and risk factors of anabolic-androgenic steroids (AAS) abuse among adolescents and young adults in Poland
Journal	Sozial-und praventivmedizin
Year/vol/no/pp	2006; 51; 6; 392-398
Abstract	*Objective:* To estimate the prevalence of anabolic-androgenic steroids (AAS) abuse among adolescent and young adults in Poland. *Method:* 3687 men (48.2%) and women (51.8%), median age 23 (interquartile range 19-30 years) participated in a survey via a ”pop-up window” which appeared on two popular Polish internet portals during one month. Questions concerning their body image, exercise behaviour, education level and use of anabolic-androgenic steroids were asked. *Results:* The prevalence of anabolic-androgenic steroids use was 6.2% among males and 2.9% among females. Male AAS users, compared to non-users, were more often concerned about their physical appearance, were less educated and often engaged in some sport activity. Among female AAS users, no significant differences concerning self-body image satisfaction or participation in sports were found. However, compared to non-users, female AAS users were less educated. *Conclusion:* The abuse of AAS is a reality in Poland and may become a serious health concern among adolescents and young adults.
Author	Sas-Nowosielski, K
Title	The abuse of anabolic-androgenic steroids by Polish school-aged adolescents
Journal	Biology of Sport
Year/vol/no/pp	2006; 23; 3; 225-235
Abstract	Although anabolic-androgenic steroids (AAS) are perceived primarily as doping agents for athletes, these substances are also used by adolescents for aesthetical purposes. The aim of this study was to determine the knowledge about AAS, the extent, main reasons and consequences of its use among adolescents in Katowice, Poland. An anonymous questionnaire were answered by 1175 students, both sexes, attending three types of schools: grammar, secondary school preparing for university and

	vocational school. The results suggest that most adolescents, especially from grammar schools, know nothing or hardly anything about AAS and health consequences of using them. Moreover, 9.38% males and 2.08% females were abusing AAS or had abused them at some time of their life. Students from vocational schools had a higher usage rate of AAS than pupils from the other two types of schools. For most of the users the main reasons for using AAS are connected with the will to change their bodies so as to improve appearance by gaining muscle mass, reduce body fat and/or improve muscle cut. Over a half of the users had suffered from some side effects of AAS: acne, hair-loss, sexual disturbances, irritability, voice deepening, depression etc. The results of this study suggest that there is an urgent need to include AAS issues into drug education programs.
Author	Savva, Susan
Title	News and notes: 1
Journal	Addiction
Year/vol/no/pp	2004; 99; 3; 389-
Abstract	The article treats the subject passive smoking in USA; it also discusses the drug use in Amsterdam, Holland, including performance-enhancing drugs. The study shows an increase in the use of illegal drugs, but still it's a small group in society that uses drugs.
Author	Simon, Perikles; Striegel, Heiko; Aust, Fabian; Dietz, Klaus; Ulrich, Rolf
Title	Doping in fitness sports: estimated number of unreported cases and individual probability of doping
Journal	Addiction
Year/vol/no/pp	2006; 101; 11; 1540-1644
Abstract	*Aim:* Recent studies have suggested that the use of doping substances and particularly of anabolic androgenic steroids (AAS) is often practised by fitness centre visitors. These studies employed direct interview techniques and questionnaires to assess the estimated number of unreported cases of doping. Because people hesitate to provide compromising information about themselves, these techniques are subject to response errors. In this study we applied an alternative interview technique to assess more accurately unreported cases of doping in fitness centres. *Design and participant:* The present investigation employed the randomized response technique (RRT) to reduce response errors. A cohort of 500 people from 49 fitness centres participated in this study. *Findings:* The RRT revealed a high prevalence of doping (12.5%). In addition, and most importantly, the present RRT study revealed an alarmingly high prevalence of illicit drug use, specifically of cocaine use, that has been severely underestimated by previous studies. *Conclusion:* The RRT confirmed previously estimated rates of AAS use assessed by direct interview techniques and voluntary questionnaires, but uncovered a much higher usage rate of illicit drugs among fitness centre visitors. This outcome enabled us to construct a "probability" rating for the use of doping substances in fitness centre visitors. Given its high prevalence and the predominant use of AAS, doping among fitness centre visitors is an issue of extreme

	relevance for the health care system. Our study may help to characterize further doping substance users and to develop and apply prevention and intervention programmes specifically to individuals at high risk.
Author	Skårderud Finn; Nygren Par; Edlund Birgitta
Title	”Bad Boys” Bodies: The Embodiment of Troubled Lives. Body Image and Disordered Eating Among Adolescents in Residential Childcare Institutions
Journal	Clinical Child Psychology and Psychiatry
Year/vol/no/pp	2005; 10; 3; 395-411
Abstract	Children residing in care (hereafter referred to as childcare residents) are a risk-group for emotional disturbances and behaviour problems. Based on existing knowledge of risk factors one would also expect this population to be a high-risk group for eating disorders and related bodyimage disorders. The objective of this study was to describe pathological eating behaviour, dysfunctional body focusing and psychological symptoms in a sample of childcare residents compared with a non-clinical sample. Sixty-one childcare residents (aged 14-21 years, mean 16.2) and a non-clinical comparison group (n = 196) completed the Eating Disorders Inventory - Child version (EDI-C). The childcare residents also completed an extended questionnaire, including questions regarding the use of anabolic-androgenic steroids. Our main findings were high scores on EDI-C symptom scales for boys in the childcare resident group; few differences between girls in the two samples; and a high frequency of having used anabolic-androgenic steroids among boys in care. Body-image problems among boys have hitherto been given little attention. The results call for increased efforts in describing and detecting pathological cognitions, emotions and behaviour concerning the body in males in general and, more specifically, in high-risk male groups, such as childcare residents.
Author	Striegel, H.; Simon, P.; Frisch, S.; Roecker, K.; Dietz, K.; Dickhuth, H.H.; Ulrich, R.
Title	Anabolic ergogenic substance users in fitness-sports: A distinct group supported by the health care system
Journal	Drug and Alcohol Dependence
Year/vol/no/pp	2006; 81; 1; 11-19
Abstract	*Background:* Anabolic ergogenic substance use, in particular the use of anabolic androgenic steroids, is a serious problem in general. Nevertheless, it is subject to debate whether ergogenic substance users exhibit similar features as multiple substance users or whether they constitute a discrete group. *Methods:* One thousand eight hundred and two standardized, anonymous questionnaires were distributed among visitors of 113 fitness centers. Questions were asked concerning biometric parameters, social indicators, physical fitness, use of natural stimulants, general illicit drugs and ergogenic substances. With logistic regression analysis, multivariate odds ratios were estimated to investigate the association of anabolic ergogenic substance or general illicit drug use with other parameters. *Results:* 13.5% of all participants confessed to having used

anabolic ergogenic substances at some point in time. Anabolic ergogenic substance use was positively related with cocaine use, training years, training frequency, negatively related to the level of education, alcohol intake and less frequently used by Germans than by non-Germans. General illicit drug use, however, was positively related with alcohol intake, smoking and a university degree and negatively with having children. In addition, anabolic ergogenic substance use was significantly related with the use of general illicit drugs based on the strong relation with the use of cocaine, which is an ergogenic substance itself. The health care system supplies 48.1% of the anaolic ergogenic substance users with their substances and 32.1% are even monitored by a physician. Conclusions: The results of this study strengthen the notion that anabolic ergogenic substance users constitute a specific body-oriented substance user group. Uncommon for general illicit drug use, the health care system is a major sponsor of anabolic ergogenic substance users. These findings suggest the need for alternative approaches for successful prevention and intervention programs. ms.

Author	Sewards TV, Sewards MA
Title	Fear and power-dominance motivation: proposed contributions of peptide hormones present in cerebrospinal fluid and plasma
Journal	Neuroscience And Biobehavioral Reviews
Year/vol/no/pp	2003; 27; 3; 247-267
Abstract	We propose that fear and power-dominance drive motivation are generated by the presence of elevated plasma and cerebrospinal fluid (CSF) levels of certain peptide hormones. For the fear drive, the controlling hormone is corticotropin releasing factor, and we argue that elevated CSF and plasma levels of this peptide which occur as a result of fear-evoking and other stressful experiences in the recent past are detected and transduced into neuronal activities by neurons in the vicinity of the third ventricle, primarily in the periventricular and arcuate hypothalamic nuclei. For the power-dominance drive, we propose that the primary signal is the CSF concentration of vasopressin, which is detected in two circumventricular organs, the subfornical organ and organum vasculosum of the lamina terminalis. We suggest that the peptide-generated signals detected in periventricular structures are transmitted to four areas in which neuronal activities represent fear and power-dominance: one in the medial hypothalamus, one in the dorsolateral quadrant of the periaqueductal gray matter, a third in the midline thalamic nuclei, and the fourth within medial prefrontal cortex. The probable purpose of this system is to maintain a state of fear or anger and consequent vigilant or aggressive behavior after the initial fear- or anger-inducing stimulus is no longer perceptible. We further propose that all the motivational drives, including thirst, hunger and sexual desire are generated in part by non-steroidal hormonal signals, and that the unstimulated motivational status of an individual is determined by the

relative CSF and plasma levels of several peptide hormones.

Author	Teuber I, Freiwald D, Volz HP
Title	Acute paranoid symptoms following intramuscular injection of nandrolone
Journal	Psychiatrische praxis
Year/vol/no/pp	2003; 30; 73-74 (Suppl. 2)
Abstract	Affective disorders and impulsivity are quite common when using anabolic substances, in this case-study one of the rather rare cases of a psychotic disorder following the abuse of androgenic steroids is described. A 30-year old formerly healthy white male was admitted as inpatient to psychiatric hospital showing symptoms of anxiety and paranoid ideation. In the last 1,5 years he had consumed androgenic steroids, directly before the Onset of the first psychotic symptoms 8 weeks before admission he had received an i.m.-injection of nandrolone. Under therapy with neuroleptics the patient recovered completely within 2 months.

Author	Trenton AJ, Currier GW
Title	Behavioural manifestations of anabolic steroid use
Journal	CNS Drugs
Year/vol/no/pp	2005; 19; 7; 571-595
Abstract	The use of anabolic androgenic steroids (AAS) for gains in strength and muscle mass is relatively common among certain subpopulations, including athletes, bodybuilders, adolescents and young adults. Adverse physical effects associated with steroid abuse are well documented, but more recently, increased attention has been given to the adverse psychiatric effects of these compounds. Steroids may be used in oral, 17 alpha-alkylated, or intramuscular, 17 beta-esterified, preparations. Commonly, steroid users employ these agents at levels 10- to 100-fold in excess of therapeutic doses and use multiple steroids simultaneously, a practice known as 'stacking'. Significant psychiatric symptoms including aggression and violence, mania, and less frequently psychosis and suicide have been associated with steroid abuse. Long-term steroid abusers may develop symptoms of dependence and withdrawal on discontinuation of AAS. Treatment of AAS abusers should address both acute physical and behavioural symptoms as well as long-term abstinence and recovery. To date, limited information is available regarding specific pharmacological treatments for individuals recovering from steroid abuse. This paper reviews the published literature concerning the recognition and treatment of behavioural manifestations of AAS abuse.

Author	Wiefferink1, C. H.; Detmar, S. B.; Coumans B.; Vogels T.; Paulussen1, T.G.W.
Title	Social psychological determinants of the use of performance-enhancing drugs by gym users
Journal	Health Education Research
Year/vol/no/pp	2007; febr 13
Abstract	The aim of this study is to identify the social psychological determinants of the use of performance-enhancing drugs by gym users who practice bodybuilding, fitness, powerlifting or combat sports. In this questionnaire-based study, 144 respondents answered questions on their actual use and intention to use such drugs

and also on their background characteristics and beliefs, such as their attitudes, social influences and self-efficacy. While all social psychological determinants correlated with intention to use these drugs, the most important predictors were personal norms, beliefs about performance outcomes and the perceived behavior of others. Non-users held more restrictive norms about using performance-enhancing drugs, were less optimistic about the performanceenhancing outcomes and believed that fewer significant others used performance-enhancingdrugs than users and ex-users. The results of this study indicate that users attribute advantages to performance-enhancing drugs and are inclined to overlook the risks of using them. Preventive interventions should focus on influencing personal norms and social processes.

Author	Yang, CFJ; Gray, P; Pope, HG
Title	Male body image in Taiwan versus the West: Yanggang Zhiqi meets the adonis complex
Journal	American Journal of Psychiatry
Year/vol/no/pp	2005; 162; 2; 263-269
Abstract	*Objective:* Body image disorders appear to be more prevalent in Western than non-Western men. Previous studies by the authors have shown that young Western men display unrealistic body ideals and that Western advertising seems to place an increasing value on the male body. The authors hypothesized that Taiwanese men would exhibit less dissatisfaction with their bodies than Western men and that Taiwanese advertising would place less value on the male body than Western media. *Method:* The authors administered a computerized test of body image to 55 heterosexual men in Taiwan and compared the results to those previously obtained in an identical study in the United States and Europe. Second, they counted the number of undressed male and female models in American versus Taiwanese women's magazine advertisements. *Results:* In the body image study, the Taiwanese men exhibited significantly less body dissatisfaction than their Western counterparts. In the magazine study, American magazine advertisements portrayed undressed Western men frequently, but Taiwanese magazines portrayed undressed Asian men rarely. *Conclusions:* Taiwan appears less preoccupied with male body image than Western societies. This difference may reflect 1) Western traditions emphasizing muscularity and fitness as a measure of masculinity, 2) increasing exposure of Western men to muscular male bodies in media images, and 3) greater decline in traditional male roles in the West, leading to greater emphasis on the body as a measure of masculinity. These factors may explain why body dysmorphic disorder and anabolic steroid abuse are more serious problems in the West than in Taiwan.

History

Author	Kalinski, Michael I.
Title	State-Sponsored Research on Creatine Supplements and Blood Doping in Elite Soviet Sport
Journal	Perspectives in Biology and Medicine

Year/vol/no/pp	2003; 46; 3; 445-451
Abstract	The former Soviet Union began participating in international sport after World War II and soon achieved a dominant position in the Olympic Games and other competitions. The success of Soviet athletic programs led to charges of unfair practices but, because of secrecy surrounding Soviet research in exercise biochemistry, it has been difficult to substantiate these charges. This article presents previously restricted information regarding the development and use of creatine supplements and blood doping in the USSR. Early work by Olexander Palladin established the role of creatine in muscle function. In the 1970s, Soviet scientists showed that oral creatine supplements improved athletic performance in short, intense activities such as sprints. Subsequent studies in the West substantiated these investigations and have led to the widespread acceptance and use of creatine supplements to enhance muscle function and athletic performance. In addition, however, the Soviet government supported the development of blood doping, which is banned by the International Olympic Committee. Blood doping was pervasive in the USSR in the 1970s and 1980s, and was used by many Soviet athletes in the 1976 and 1980 Olympic Games. Open publication and discussion may help to prevent the abuses that can come from secret scientific research.

Ethics and philosophy

Author	Blancher G, Denjean A, Riviere D, et al
Title	The practice of sport : benefits and risks
Journal	Bulletin de l'Académie nationale de médecine
Year/vol/no/pp	2004; 188; 6; 903-974
Abstract	La pratique du sport : bénéfices et risques.

Author	Butcher, James
Title	Cognitive enhancement raises ethical concerns
Journal	Lancet
Year/vol/no/pp	2003; 362; 9378; 132-134
Abstract	Reports that academics are urging pre-emptive debate on neurotechnologies and the use of drugs that improve or enhance cognitive function. Prevalence of the use of performance-enhancing drugs such as mehylphenidate (Ritalin) in academic circles; Ethics of cognitive enhancement including psychopharmaceuticals, neuronal tissue implants, and brain-computer interfaces; Availability of these cognitive enhancers; Development of drugs for non-Alzheimer, age-related memory loss; Discussion of the effect cognitive-enhancing drugs might have on social justice and equality; Effects of cognitive enhancers on cultural diversity and the perception of self; Comments on the responsibility of the scientist.

Author	Buyx, Alena M.
Title	Beyond therapy / Jenseits der Therapie
Journal	Ethik in der Medizin
Year/vol/no/pp	2006; 18; 3; 267-272
Abstract	Taqgungsbericht: Klausurwochen zu ethischen und sozialen Aspekten einer medizinischen und gentechnischen Verbesse-

rung menschlicher Eigenschaften, Anlagen und Faehigkeiten. Institut fuer Wissenschaft und Ethik in Zusammenarbeit mit dem Deutschen Referenzzentrum fuer Ethik in den Biowissenschaften Bonn, 24. Maerz bis 2. April 2006.

Author Chatterjee A.
Title The promise and predicament of cosmetic neurology
Journal Journal of Medical Ethics
Year/vol/no/pp 2006; 32; 2; 110-3

Author Crowther, Nigel
Title The state of the modern Olympics: citius, altius, fortius ?
Journal European review
Year/vol/no/pp 2004; 12; 3; 445-460
Abstract Baron Pierre de Coubertin purported to follow the traditions of the ancient Olympic Games, but adapted them to fit his own political, social, and sporting conceptions. From their very beginning, the modern Games have had aspirations that have extended beyond sport. After brief comments on corruption, philosophy of life, and spectacle, this essay examines the Olympic Games in terms of amateurism and professionalism; winning and the joy of participation; nationalism and ultra-nationalism; the medal count; war, violence, and peace; performance-enhancing drugs; women and minorities; and the Americanization of the Games.

Author Culbertson L
Title The paradox of bad faith and elite competitive sport
Journal Journal of the Philosophy of Sport
Year/vol/no/pp 2005; 32; 1; 65-86
Key Words Sartre; technologies; self; issue; drugs

Author Hardegree L.
Title The inside dope
Journal Medical Laboratory Observer
Year/vol/no/pp 2005; 37; 9; 6

Author Kayser, B.; Mauron, A.; Miah, A.
Title Viewpoint: Legalisation of performance-enhancing drugs
Journal Lancet (British edition)
Year/vol/no/pp 2005; 366; 21

Author Koudinov, Alexei R.
Title Doping by the pool?
Journal Doping Journal
Year/vol/no/pp 2004; 1; 1
Abstract Do you watch Olympic Games in Athens? I was forced to when my national swimming team did not get any medal contrasting with the success of the US and Australian athletes. Just before competition all seemed ready to compete and win, but only few were wearing headphones and listening music. Why not all are in equal condition, is it fair, my daughter noted? Research published previously (J Nurs Res. 2003 Sep; 11(3): 209-16) showed that in humans music makes saturation of oxyhemoglobin (SPO(2)) significantly higher (compared with controls not receiving music therapy, $p<0.01$), and that under music therapy the level of oxygen saturation returns to the baseline faster compared to controls receiving no music, $p<0.01$), making it hard to detect the transient oxygen saturation shortly thereafter. The statistically significant higher SPO(2) level indicates the ”enhancement of oxygen transfer”, and implies that ”music by the pool” is a prohibited by The World Anti-Doping Agency (WADA) in-competition blood-doping method of ”the use of products that enhance the uptake, trans-

	port or delivery of oxygen," apparently conflicting with the essense of olympism, and WADA call for "ethics, fair play and honesty." If so, should the Athens Olympic games 2004 swimming results be corrected?
Author	Le Page M.
Title	Tour de France superstar scandal continues. Is he innocent? You decide
Journal	New Scientist
Year/vol/no/pp	2006; 19-25; 191(2565); 18-9
Author	Lindsey, Joe ; Startt, James
Title	Tour de France superstar scandal continues. Is he innocent? You decide
Journal	Doping Journal
Year/vol/no/pp	2005; 2; 2
Abstract	It was a measure of how hard-fought this battle would be that Lance Armstrong's rebuttal to l'Equipe was posted before the French sports daily published its story alleging that urine samples taken from the seven-time Tour de France winner at the 1999 Tour had tested positive for EPO. At 10 p.m. Mountain Time on Monday, Aug. 22, 2005, www.lequipe.fr had no mention of anything Armstrong-related; its top cycling story was a report on the Tour of Germany. But on www.thepaceline.com, the official fan site for the Discovery Channel team, was a three-paragraph response to the upcoming story. Armstrong reacted to l'Equipe's charges as he has in the past to other allegations that he's used performance-enhancing drugs. He asserted that he's never used performance-enhancing drugs, pointed out that he's never tested positive for drugs, and questioned the motives and integrity of the accuser. L'Equipe, similarly, mixed questions of motive and integrity with fact. Under the headline "The Armstrong Lie" the paper called Armstrong a cheat, going so far as to say that his seven Tour wins and the legend of his dominance, are a lie.
Author	Miah, Andy
Title	Be very afraid: cyborg athletes, transhuman ideals and posthumanity
Journal	Play the game (nättidskrift: [Journal published on the Internet:] http://www.play-the-game.org/) (även publicerad i: [also published in:] Journal of Evolution and Technology)
Year/vol/no/pp	2004-04-28
Abstract	Miah describe sport as a unique milieu in which we can see a development of "physical transcendence of humannes". The writer argues that this development could get legitimation inside the sport community.
Author	Miah A.
Title	Doping and the child: an ethical policy for the vulnerable
Journal	Lancet
Year/vol/no/pp	2005; 10-16; 366(9489); 874-6
Author	Miah, A; Rich, E
Title	Genetic tests for ability?: talent identification and the value of an open future
Journal	Sport Education and Society
Year/vol/no/pp	2006; 11; 3; 259-273
Abstract	This paper explores the prospect of genetic tests for performance in physical activity and sports practices. It investigates the terminology associated with genetics, testing, selection and ability as a means towards a socio-ethical analysis of its value within sport, education and society. Our argument suggests that genetic tests need not even be

used (or widely used) as a tool for talent identification to have an impact on the way in which abilities are recognised and celebrated within sport. Just the development of these tests may consolidate discourses associated with performance and techno-scientific views of the bodies which are drawn upon in selecting, labelling and positioning some, rather than others, as 'able'. The attachment of sports institutions to these technologies may be helping to shape a theoretical and wider social construction of how performance is viewed. Our paper problematises the place that such testing may assume in the culture of physical activity and potentially physical education. In doing so, we explore how the development of these tests may impact educational practices related to sport in two keys ways. Firstly, the direct impact in terms of the ways in which the information from these tests may be used to influence the sports experience of young people, within both physical education and sports arenas. Secondly, we consider how, on a broader level, the increasing importance given to genetic science may be (re)constructing wider social understandings of the nature of 'ability' within sport and physical activity. Our response to these developments extends Feinberg's thesis on an 'open future', which argues that selecting the characteristics of children would be unacceptable on account of it diminishing the openness of that child's future - the range of prospects they might encounter that could lead to the flourishing of their life. On this view, we argue that genetic tests for performance might violate the child's right to an open future and that this concern should be taken into account when considering how and whether such tests should be used.

Author	Millar, Anthony P.
Title	Drugs, Sport and the Olympics Future: Gold Medals for Ineptitude and Unfairness?
Journal	Doping Journal
Year/vol/no/pp	2005; 2; 1
Abstract	At present there is a total lack of any moral or philosophical basis for the public attitudes towards the use of drugs in sport. In the WADA manifesto there is no definition of a drug only examples. How can there be an example of something that cannot be defined? This leads to total confusion in the use of prohibited substances and the permitted use of other similar preparations producing almost identical effects. The whole area needs to be reviewed by an outside body with no vested interest in the outcome. Probably the Doping Journal, as it is totally independent of the vested interests responsible for the present confusion, would be an ideal vehicle for such a review.

Author	Noakes, Timothy D.
Title	Should We Allow Performance-Enhancing Drugs in Sport? A Rebuttal to the Article by Savulescu and Colleagues
Journal	Sports Science & Coaching
Year/vol/no/pp	2006; 1; 4
Abstract	Savulescu et al. [1] propose that, since it will never be possible to controldrug use in sport, athletes should be allowed to use those performanceenhancing drugs that are "safe". The authors fail to explain, however, why appro-

	priate doping control has yet to be achieved in world sport. In thisrebuttal, it is argued that the widespread doping of elite athletes, as is now common, cannot easily occur without government collusion that is ei ther overt or covert. There is also evidence that a number of international sporting bodies have followed the same principle. Furthermore, since their products are so readily available to elite athletes, those pharmaceutical companies that manufacture the most popular performanceenhancing drugs would appear to be indifferent to the misuse of their products by athletes for nonmedical purposes. The control of drug use in sport has never been achieved, because these three stakeholders who should have acted to eliminate doping in sport appear to have chosen an opposite action without due consideration for their ethical responsibility to protect athletes from the proven dangers of doping. Doping in sport can only ever be defended for exclusively commercial reasons (both legal and criminal) and certainly not on the illusory ethical grounds proposed by Savulescu et al. [1].
Author	Sabini J; Monterosso J.
Title	Judgments of the fairness of using performance enhancing drugs
Journal	Ethics & Behavior
Year/vol/no/pp	2005;15; 1; 81-94
Abstract	Undergraduates (total N=185) were asked about performance-affecting drugs. Some drugs supposedly affected athletic performance, others memory, and other attention. Some improved performance for anyone who took them, others for the top 10% of performers, others for the bottom 10%, and finally, yet other drugs worked only on the bottom 10% who also showed physical abnormalities. Participants were asked about the fairness of allowing the drug to be used, about banning it, and about whether predictions of future performance based on testing with or without the drug were better. The study found that participants appreciated the ”interaction effect,” that they felt it was less unfair to allow the drug if it affected the bottom 10% than if it affected everyone, and they were more eager to have the drug banned if it affected everyone. Participants were least tolerant of drugs that affected athletic performance and most tolerant of those that affected attention.
Author	Savulescu, J.; Foddy B.; Clayton M.
Title	Why we should allow performance enhancing drugs in sport
Journal	British Journal of Sports Medicine,
Year/vol/no/pp	2004; 38; 666-670
Abstract	The use of performance enhancing drugs in the modern Olympics is on record as early as the games of the third Olympiad, when Thomas Hicks won the marathon after receiving an injection of strychnine in the middle of the race. The first official ban on ”stimulating substances” by a sporting organisation was introduced by the International Amateur Athletic Federation in 1928. Using drugs to cheat in sport is not new, but it is becoming more effective. In 1976, the East German swimming team won 11 out of 13

	Olympic events, and later sued the government for giving them anabolic steroids. Yet despite the health risks, and despite the regulating bodies' attempts to eliminate drugs from sport, the use of illegal substances is widely known to be rife. It hardly raises an eyebrow now when some famous athlete fails a dope test. In 1992, Vicky Rabinowicz interviewed small groups of athletes. She found that Olympic athletes, in general, believed that most successful athletes were using banned substances. Much of the writing on the use of drugs in sport is focused on this kind of anecdotal evidence. There is very little rigorous, objective evidence because the athletes are doing something that is taboo, illegal, and sometimes highly dangerous. The anecdotal picture tells us that our attempts to eliminate drugs from sport have failed. In the absence of good evidence, we need an analytical argument to determine what we should do.
Author	Schneider AJ, Friedmann T.
Title	Gene doping in sports: the science and ethics of genetically modified athletes
Journal	Advances in Genetics
Year/vol/no/pp	2006; 51; 1-110
Author	Shapiro MH.
Title	The identity of identity: moral and legal aspects of technological selftransformation
Journal	Social Philosophy and Policy
Year/vol/no/pp	2005;2; 2; 308-73
Author	Society for Neuroscience
Title	New research finds that the common arguments against the development of cognitive enhancers are misguided
Journal	Doping Journal
Year/vol/no/pp	2005; 2; 3
Abstract	As the development of cognitive enhancers gains momentum, questions have arisen about the ethics of issues such as the making or taking of a pill that could boost brain power. New research, however, finds that the common arguments against their development are misguided and should be replaced by an understanding that takes into account the subtle differences of the ethics of enhancement. "Our findings may help steer us toward more fruitful discussions regarding cognitive enhancement," says Thomas H. Murray, PhD, of The Hastings Center in Garrison, NY, "and may aid us in answering questions like: What if we could think better?"

Science

Author	Ashley, Steven
Title	Doping by design: why new stereoids are easy to make and hard to detect
Journal	Scientific American
Year/vol/no/pp	2004; February; 12-13
Author	Avois, L; Robinson, N; Saudan, C; et al.
Title	Central nervous system stimulants and sport practice
Journal	British Journal of Sports Medicine
Year/vol/no/pp	2006; 40; 16-20 (Suppl. 1)
Abstract	*Background and objectives:* Central nervous system (CNS) stimulants may be used to reduce tiredness and increase alertness, competitiveness, and aggression. They are more likely to be used in competition but maybe used during training to increase the intensity of the training session. There are several potential dangers involving their misuse in contact

	sports. This paper reviews the three main CNS stimulants, ephedrine, amphetamine, and cocaine, in relation to misuse in sport. *Methods:* Description of the pharmacology, actions, and side effects of amphetamine, cocaine, and ephedrine. *Results:* CNS stimulants have psychotropic effects that may be perceived to be ergogenic. Some are prescription drugs, such as Ephedra alkaloids, and there are issues regarding their appropriate therapeutic use. Recently attention has been given to their widespread use by athletes, despite the lack of evidence regarding any ergogenic or real performance benefit, and their potentially serious side effects. Recreational drugs, some of which are illegal (cocaine, amphetamines), are commonly used by athletes and cause potential ergolytic effects. Overall, these drugs are important for their frequent use and mention in anti-doping laboratories statistics and the media, and their potentially serious adverse effects. *Conclusions:* Doping with CNS stimulants is a real public health problem and all sports authorities should participate in its prevention. Dissemination of information is essential to prevent doping in sport and to provide alternatives. Adequate training and education in this domain should be introduced.
Author	Bahrke, M.S.; Yesalis, C.E.
Title	Abuse of anabolic androgenic steroids and related substances in sport and exercise
Journal	Current Opinion in Pharmacology
Year/vol/no/pp	2004; 4; 6; 614-620
Abstract	Anabolic androgenic steroids are synthetic derivatives of testosterone, which is the primary male sex hormone. Anabolic androgenic steroids are used to enhance athletic performance and appearance. Adverse effects include those on the liver, serum lipids, psyche/behavior and reproductive system. Androstenedione is an anabolic androgenic steroid used to increase blood testosterone levels for the purposes of increasing strength, lean body mass and sexual performance. However, there is no research indicating that androstenedione, or its related compounds, significantly increases strength and/or lean body mass in humans by increasing testosterone levels. The long-term health effects of prolonged androstenedione supplementation are unknown. Dehydroepiandrosterone (DHEA) is a weak androgen also used to elevate testosterone levels, and is advertised as an anti-obesity and anti-aging supplement capable of improving libido, vitality and immunity levels. However, research demonstrates that DHEA supplementation does not increase serum testosterone concentrations or increase strength in men, and may acutely increase testosterone levels in women, thus producing a virilizing effect.
Author	Baume N, Schumacher YO, Sottas PE, et al.
Title	Effect of multiple oral doses of androgenic anabolic steroids on endurance performance and serum indices of physical stress in healthy male subjects
Journal	European Journal of Applied Physiology
Year/vol/no/pp	2006; 98; 4; 329-340
Abstract	Anabolic androgenic steroids (AAS) are doping agents that

	are mostly used for improvement of strength and muscle hypertrophy. In some sports, athletes reported that the intake of AAS is associated with a better recovery, a higher training load capacity and therefore an increase in physical and mental performances. The purpose of this study was to evaluate, the effect of multiple doses of AAS on different physiological parameters that could indirectly relate the physical state of athletes during a hard endurance training program. In a double blind settings, three groups (n = 9, 8 and 8) were orally administered placebo, testosterone undecanoate or 19-norandrostenedione, 12 times during 1 month. Serum biomarkers (creatine kinase, ASAT and urea), serum hormone profiles (testosterone, cortisol and LH) and urinary catecholamines (noradrenalin, adrenalin and dopamine) were evaluated during the treatment. Running performance was assessed before and after the intervention phase by means of a standardized treadmill test. None of the measured biochemical variables showed significant impact of AAS on physical stress level. Data from exercise testing on submaximal and maximal level did not reveal any performance differences between the three groups or their response to the treatment. In the present study, no effect of multiple oral doses of AAS on endurance performance or bioserum recovery markers was found.
Author	Bloch M, Rubinow DR, Berlin K, et al.
Title	Monoamines and neurosteroids in sexual function during induced hypogonadism in healthy men
Journal	Archives of General Psychiatry
Year/vol/no/pp	2006; 63; 4; 450-456
Abstract	*Context:* Although the behavioral effects of high-dose androgen administration may involve alterations in serotonergic activity, few studies have investigated the impact of androgen withdrawal on the central nervous system in humans. *Objective:* To examine the effects of pharmacologically induced hypogonadism on several cerebrospinal fluid (CSF) systems that could mediate the behavioral concomitants of hypogonadism. *Design:* Double-blind assessment of the effects of the short-term induction of hypogonadism and subsequent replacement with testosterone and placebo in a crossover design. *Setting*: National Institutes of Health, Bethesda, Md. Participants: Twelve healthy male volunteers. *Interventions:* We administered the gonadotropin-releasing hormone agonist leuprolide acetate (7.5 mg in-tramuscularly every 4 weeks) to the healthy male volunteers, creating a hypogonadal state, and then either replaced testosterone (200 mg intramuscularly) or administered a placebo every 2 weeks for 1 month. *Main Outcome Measures:* Mood and behavioral symptoms were monitored with daily self-ratings, and lumbar punctures were performed during both hypogonadal (placebo) and testosterone-replaced conditions for CSF levels of steroids and monoamine metabolites.

	Results: The CSF testosterone, dihydrotestosterone, and androsterone levels were significantly lower during hypogonadism (P = .002, .04, and .046, respectively), but no significant changes were observed in CSF measures of 5-hydroxyindoleacetic acid, homovanillic acid, dehydroepiandrosterone, or pregnenolone. Decreased sexual interest was observed during the hypogonadal state compared with both baseline and testosterone replacement (P = .009) and correlated significantly with CSF measures of androsterone during both hypogonadism and testosterone replacement (r = -0.76 and -0.81, respectively; P < .01). Moreover, the change in severity of decreased sexual interest correlated significantly with the change in CSF androsterone levels between testosterone replacement and hypogonadism (r = -0.68; P < .05). The CSF 5-hydroxyindoleacetic acid and homovanillic acid levels did not correlate significantly with any behavioral or CSF measure. *Conclusion:* These data suggest that the neurosteroid androsterone contributes to the regulation of sexual function in men.
Author	Breeman, Daniel
Title	Drugs and sports: New niche for pharmacy
Journal	Drug Topics
Year/vol/no/pp	2005;149; 23; 52
Abstract	The use of illegal steroids and performance-enhancing drugs is clearly on the rise. Because of this, both collegiate and professional sports teams are finding themselves under increasing pressure to monitor the drugs their athletes take. Few have a pharmacist on board to handle tasks such as the ordering and prescribing of Rx drugs for their athletes. That's where Robert Nickell, R.Ph. and president/CEO of SportPharm Pharmaceuticals, Torrance, Calif., and his company come into play. Licensed by the Food & Drug Administration and state board of pharmacy, SportPharm can deliver medications directly to athletes or supply the team physician with medications repackaged to strict FDA standards for dispensing or administration on an as-needed basis.
Author	Clark, A.S.; Henderson, L.P.
Title	Behavioral and physiological responses to anabolic-androgenic steroids
Journal	Neuroscience and Biobehavioral Reviews
Year/vol/no/pp	2003; 27; 5; 413-436
Abstract	Anabolic-androgenic steroids (AAS) are synthetic derivatives of testosterone originally designed for therapeutic uses to provide enhanced anabolic potency with negligible androgenic effects. Although AAS continue to be used clinically today, the medical benefits of low therapeutic doses of AAS stand in sharp contrast to the potential health risks associated with the excessive doses self-administered not only by elite athletes and body builders, but by a growing number of recreational users, including adolescent boys and girls. The deleterious effects of AAS on peripheral organs and the incidence of altered behaviors in AAS abusers have been well documented in a number of excellent current reviews for clinical populations. However, a comparable synthesis of

	nonclinical studies has not been made. Our purpose in this review is to summarize the literature for animal models of the effects of supraphysiological doses of AAS (e.g. those that mimic human abuse regimes) on behaviors and on the neural circuitry for these behaviors. In particular, we have focused on studies in rodents that have examined how AAS alter aggression, sexual behaviors, anxiety, reward, learning, and locomotion and how AAS alter the expression and function of neurotransmitter systems and other signaling molecules that underlie these behaviors.
Author	Clark, A.S.; Costine, B.A.; Jones, B.L.; et al.
Title	Sex- and age-specific effects of anabolic androgenic steroids on reproductive behaviors and on GABAergic transmission in neuroendocrine control regions
Journal	Brain Research
Year/vol/no/pp	2006; 1126; 1; 122-138
Abstract	Illicit use of anabolic androgenic steroids (AAS) has become a prevalent health concern not only among male professional athletes, but, disturbingly, among a growing number of women and adolescent girls. Despite the increasing use of AAS among women and adolescents, few studies have focused on the effects of these steroids in females, and female adolescent subjects are particularly underrepresented. Among the hallmarks of AAS abuse are changes in reproductive behaviors. Here, we discuss work from our laboratories on the actions of AAS on the onset of puberty and sexual behaviors in female rodents, AAS interactions and sex- and age-specific effects of these steroids on neural transmission mediated by @c-aminobutyric acid receptors within forebrain neuroendocrine control regions that may underlie AAS-induced changes in these behaviors.
Author	Cunningham, R.L.; McGinnis, M.Y.
Title	Factors influencing aggression toward females by male rats exposed to anabolic androgenic steroids during puberty
Journal	Hormones and Behavior
Year/vol/no/pp	2007; 51; 1; 135-141
Abstract	Previous results showed that male rats pubertally exposed to anabolic androgenic steroids (AAS) displayed aggression towards females in response to physical provocation. This experiment examined two factors that may modulate AAS-induced behavior towards females: olfactory cues and frustration. Gonadally intact males began one of three AAS treatments at puberty (D40): testosterone propionate (T), stanozolol (S), T+S, or vehicle control. To test for the relevance of olfactory cues in the elicitation of behavior toward females, a hidden neighbor paradigm was used. The proximal stimulus was an ovariectomized (OVX) female, estrogen plus progesterone (E+P) female, or an E+P female with tape-obstructed vagina (OBS). Distal olfactory cues from a hidden neighbor were delivered from a separate cage connected to the testing arena. The vaginally obstructed, sexually receptive female (OBS) was used to determine the effects of frustration on behavior by AAS males. Both sexual and aggressive behaviors were measured. The presence of distal olfactory cues had

	no effect on either sexual or aggressive behavior. In the presence of E+P and OBS females, all males displayed sex behaviors, not aggression. However, AAS males displayed significantly more aggression towards proximal OVX females than controls. AAS males mounted OBS females significantly more than controls, indicating a persistence of once rewarded behavior. These results suggest (1) proximal cues of the conspecific female are more salient than distal olfactory cues in determining behavior and (2) AAS males display frustration-induced persistence in response to vaginally obstructed receptive females.
Author	Dieye, AM; Ndiaye, M; Ndiaye, M; et al.
Title	Retail pharmacists and doping in sport: Survey on knowledge and attitudes in Dakar in Senegal
Journal	Science & Sports
Year/vol/no/pp	2003; 18; 2; 104-107
Abstract	*Aim:* - Evaluate the knowledge of retail pharmacists of doping in sport and to describe their attitude in front to this phenomenon. *Methods:* - We proceeded by a prospective self-reported survey by postal mail with 105 retail pharmacists in Dakar which contains 299 pharmacies. *Results:* - We have received 68 answers. Only 10% of pharmacists know doping products. They feel concerned with the problem of doping (81%) and 19% of them said having been contacted during these last 12 months for advice on doping products. They consider that doping is a kind of drug addiction and a public health problem. They estimated to 95% that the most effectiveness means of prevention would be to talk about side effects of doping products with the support of doctors. *Conclusion:* - This study which has to be extended must bring us to do big preventing actions.
Author	Evans, N.A.
Title	Current concepts in anabolic-androgenic steroids
Journal	American Journal of Sports Medicine
Year/vol/no/pp	2004; 32; 2; 534-542
Abstract	Anabolic-androgenic steroids (AAS) are synthetic derivatives of testosterone. According to surveys and media reports, the legal and illegal use of these drugs is gaining popularity. Testosterone restores sex drive and boosts muscle mass, making it central to 2 of society's rising preoccupations: perfecting the male body and sustaining the male libido. The anabolic effects of AAS have been questioned for decades, but recent scientific investigation of supraphysiologic doses supports the efficacy of these regimens. Testosterone has potent anabolic effects on the musculoskeletal system, including an increase in lean body mass, a dose-related hypertrophy of muscle fibers, and an increase in muscle strength. For athletes requiring speed and strength and men desiring a cosmetic muscle makeover, illegal steroids are a powerful lure, despite the risk of subjective side effects. Recent clinical studies have discovered novel therapeutic uses for physiologic doses of AAS, without any significant adverse effects in the short term. In the wake of important scientific advances during the past decade, the

	positive and negative effects of AAS warrant reevaluation. Guidelines for the clinical evaluation of AAS users will be presented for sports medicine practitioners.
Author	Farrell SF, McGinnis MY
Title	Effects of pubertal anabolic-androgenic steroid (AAS) administration on reproductive and aggressive behaviors in male rats
Journal	Behavioral Neuroscience
Year/vol/no/pp	2003; 117; 5; 904-911
Abstract	Adolescence in human males is a hormonally sensitive period when many adult behaviors develop, including sexual and aggressive behaviors. Using a rat model, the authors examined the effects of three anabolic-androgenic steroids (AAS) during puberty: testosterone, nandrolone, and stanozolol. Copulation, vocalizations, scent-marking, and aggression were tested following AAS exposure. Relative to gonadally intact controls, rats injected with testosterone showed a significant increase in scent-marking and aggression in the opponent's home cage. Nandrolone had no effect. Stanozolol significantly inhibited all behaviors. Results suggest that depending on the chemical structure of the steroid, AAS exposure during puberty affects several androgen-dependent behaviors. Because adolescence in humans is a period of hormonal change, abuse of AAS, particularly stanozolol, during this time may disrupt the establishment of normal adult behavior patterns.
Author	Ferreira A, Lamarque S, Boyer P, et al.
Title	Spontaneous appetence for wheel-running: a model of dependency on physical activity in rat
Journal	European Psychiatry
Year/vol/no/pp	2006; 21; 8; 580-588
Abstract	According to human observations of a syndrome of physical activity dependence and its consequences, we tried to examine if running activity in a free activity paradigm, where rats had a free access to activity wheel, may present a valuable animal model for physical activity dependence and most generally to behavioral dependence. The pertinence of reactivity to novelty, a well-known pharmacological dependence predictor was also tested. Given the close linkage observed in human between physical activity and drugs use and abuse, the influence of free activity in activity wheels on reactivity to amphetamine injection and reactivity to novelty were also assessed. It appeared that (1) free access to wheel may be used as a valuable model for physical activity addiction, (2) two populations differing in activity amount also differed in dependence to wheel-running. (3) Reactivity to novelty did not appeared as a predictive factor for physical activity dependence (4) activity modified novelty reactivity and (5) subjects who exhibited a high appetence to wheel-running, presented a strong reactivity to amphetamine. These results propose a model of dependency on physical activity without any pharmacological intervention, and demonstrate the existence of individual differences in the development of this addiction. In addition, these data highlight the development of a likely vulnerability to pharmacolo-

	gical addiction after intense and sustained physical activity, as also described in man. This model could therefore prove pertinent for studying behavioral dependencies and the underlying neurobiological mechanisms. These results may influence the way psychiatrists view behavioral dependencies and phenomena such as doping in sport or addiction to sport itself.
Author	Geyer H, Parr MK, Mareck U, et al.
Title	Analysis of non-hormonal nutritional supplements for anabolic-androgenic steroids - Results of an international study
Journal	International Journal of Sports Medicine
Year/vol/no/pp	2004; 25; 2; 124-129
Abstract	Several recent studies have shown evidence of some nutritional supplements containing prohibited anabolic androgenic steroids, so-called prohormones, which were not declared on the label. Therefore, a broad-based investigation of the international nutritional supplement market was initiated to clarify the extent of this problem. From October 2000 until November 2001, 634 non-hormonal nutritional supplements were purchased in 13 countries from 215 different suppliers. Most supplements were bought in shops in the respective countries (578 samples = 91.2%) and on the internet (52 samples = 8.2%). 289 supplements were from prohormone-selling companies and 345 supplements came from companies which do not offer prohormones. After isolation from the supplement matrix 11 different anabolic androgenic steroids, mainly prohormones of testosterone and nandrolone, were analysed by gas-chromatography/ mass spectrometry. Out of the 634 samples analysed 94 (14.8%) contained anabolic androgenic steroids not declared on the label (”positive supplements”). We could not obtain reliable data for 66 samples (10.4%) due to matrix effects. In relation to the total number of products purchased per country, most of the positive supplements were bought in the Netherlands (25.8%), in Austria (22.7%), in the UK (18.8%) and the USA (18.8%). According to the label, all positive supplements were from companies located in only five countries: the USA, the Netherlands, the UK, Italy and Germany. 21.1% of the nutritional supplements from prohormone-selling companies contained anabolic androgenic steroids, whereas 9.6% of the supplements from companies not selling prohormones were positive. The positive supplements showed anabolic androgenic steroid concentrations of 0.01 mug/g up to 190 mug/g. The administration of supplements containing nandrolone prohormones adding up to a total uptake of more than 1 mug resulted in positive doping results for norandrosterone for several hours.
Author	Green, Gary A.
Title	Doping Control for the Team Physician: A Review of Drug Testing Procedures in Sport
Journal	The American Journal of Sports Medicine
Year/vol/no/pp	2006; 34; 10; 1690-1698
Abstract	Drug testing is now ubiquitous in sport, and it often falls to the team physician

	to perform a variety of roles including interpreting test results, designing drug-testing programs, acting as medical review officer, and providing therapeutic use exemptions, education, and counseling. Proper understanding of current testing methods for drugs such as anabolic-androgenic steroids, erythropoietin, and growth hormone is essential if the team physician is going to assume these positions. This article outlines the basics of athletic drug testing from the collection process through the interpretation of results to assist the team physician in this field.
Author	Grimes JM, Ricci LA, Melloni RH
Title	Glutamic acid decarboxylase (GAD(65)) immunoreactivity in brains of aggressive, adolescent anabolic steroid-treated hamsters
Journal	Hormones and Behavior
Year/vol/no/pp	2003; 44; 3; 271-280
Abstract	Chronic anabolic-androgenic steroid (AAS) treatment during adolescence facilitates offensive aggression in male Syrian hamsters (Mesocricetus auratus). The current study assessed whether adolescent AAS exposure influenced the immunohistochemical localization of glutamic acid decarboxylase (GAD(65)), the rate-limiting enzyme in the synthesis of gamma-aminobutyric acid (GABA), in areas of hamster brain implicated in aggressive behavior. Hamsters were administered high dose AAS throughout adolescence, scored for offensive aggression, and then examined for differences in GAD(65) puncta to regions of the hamster brain important for aggression. When compared with control animals, aggressive AAS-treated hamsters showed significant increases in the area covered by GAD(65) immunoreactive puncta in several of these aggression regions, including the anterior hypothalamus, ventrolateral hypothalamus, and medial amygdala. Conversely, aggressive AAS-treated hamsters showed a significant decrease in GA(65)-ir puncta in the lateral septum when compared with oil-treated controls. However, no differences in GAD(65) puncta were found in other aggression areas, such as the bed nucleus of the stria terminalis and central amygdala. Together, these results support a role for altered GAD(65) synthesis and function in adolescent AAS-facilitated offensive aggression.
Author	Hampton, Tracy
Title	Researchers Address Use of Performance-Enhancing Drugs in Nonelite Athletes
Journal	JAMA
Year/vol/no/pp	2006; 295; 6; 607-608
Author	Hoffman, Jay R.; Ratamess, Nicholas A.
Title	Medical issues associated with anabolic steroid use: are they exaggerated?
Journal	Journal of Sports Science and Medicine
Year/vol/no/pp	2006; 5; 2; 182-193
Abstract	For the past 50 years anabolic steroids have been at the forefront of the controversy surrounding performance enhancing drugs. For almost half of this time no attempt was made by sports governing bodies to control its use, and only recently have all of the major sports governing bodies in North America agreed to

	ban from competition and punish athletes who test positive for anabolic steroids. These punitive measures were developed with the primary concern for promotion of fair play and eliminating potential health risks associated with androgenic-anabolic steroids. Yet, controversy exists whether these testing programs deter anabolic steroid use. Although the scope of this paper does not focus on the effectiveness of testing, or the issue of fair play, it is of interest to understand why many athletes underestimate the health risks associated from these drugs. What creates further curiosity is the seemingly well-publicized health hazards that the medical community has depicted concerning anabolic steroidabuse. Is there something that the athletes know, or are they simply naïve regarding the dangers? The focus of this review is to provide a brief history of anabolic steroid use in North America, the prevalence of its use in both athletic and recreational populations and its efficacy. Primary discussion will focus on health issues associated with anabolic steroid use with an examination of the contrasting views held between the medical community and the athletes that are using these ergogenic drugs. Existing data suggest that in certain circumstances the medical risk associated with anabolic steroid use may have been somewhat exaggerated, possibly to dissuade use in athletes.
Author	Karila TAM, Karjalainen JE, Mantysaari MJ, et al.
Title	Anabolic androgenic steroids produce dose-dependent increase in left ventricular mass in power athletes, and this effect is potentiated by concomitant use of growth hormone
Journal	International Journal of Sports Medicine
Year/vol/no/pp	2003; 24; 5; 337-343
Abstract	Power athletes abuse anabolic androgenic steroids (AASs) and growth hormone (GH) to gain their muscular mass and strength. We wanted to determine how massive, self-administered doses of AASs with or without GH affect the left ventricular (LV) dimensions in power athletes. These substances are assumed to increase LVmass mainly by thickening the ventricular walls. Anecdotal evidence suggests a higher risk of cardiovascular events in AAS abusers. We were interested to see if LV dimensions and function in AAS abusers would indicate this increased risk. Twenty healthy male power athletes using massive doses of AAS without (n = 16) or with (n = 4) GH volunteered for the study. The controls were 15 sedentary male non-users of hormones. LV mass, geometry and filling were studied using standard echocardiographic methods. We found a significant association between IV mass and AAS dose ($r = 0.54$, $p < 0.015$). In contrast to the controls, IV mass (274 g in the athletes, 167 g in the controls) among the AAS abusers did not correlate with body weight or height. Concomitant use of AAS and GH further increased LV mass and associated with concentric remodelling of LV. Multiple regression analysis indicated that the mean AAS dose accountedfor 29%, age for 14% and systolic blood pressure for 17% of the variance

	in IV mass. We concluded that AAS abuse associates dose-dependently with myocardial hypertrophy and that concomitant use of GH associates with concentric remodelling of the LV. Our findings suggest that AASs and GH have a direct effect on the myocardium.
Author	Karila T, Hovatta O, Seppala T
Title	Concomitant abuse of anabolic androgenic steroids and human chorionic gonadotrophin impairs spermatogenesis in power athletes
Journal	International Journal of Sports Medicine
Year/vol/no/pp	2004; 25; 4; 257-263
Abstract	Abuse of anabolic androgenic steroids (AASs) may be an aetiological factor in male infertility among recreational power athletes. They try to avoid AAS-induced deterioration in spermatogenesis by combining doses of human chorionic gonadotrophin (HCG) and/or antiestrogens with their AAS abuse. Eighteen healthy male power athletes using massive doses of AASs were recruited for the study. Semen samples were collected during AAS abuse and 1.5 and 6 months after cessation of the abuse. They were also asked about their reproductive activity six years after the study. At the end of the AAS cycle, the sperm count was 33 49 x 10(6)/ml (mean +/- SD), and only one subject had azoospermia. At 1.5 months after cessation of the AAS cycles, the mean sperm concentration was 3042 x 10(6)/ml, and after six months 77 +/- 70 x 10(6)/ml. There were significant differences between the sample drawn six months after cessation of AAS abuse and both samples drawn during and 1.5 months after the abuse (p less than or equal to 0.05, repeated measures of ANOVA). There was a significant positive correlation between HCG dose during the cycle and the relative amount of morphologically abnormal spermatozoa ($r = 0.60$, $p < 0.01$). The concomitant abuse of HCG and supra-physiological AAS dose cause transient impairment on semen quality in males, although spermatogenesis is maintained with this regimen despite prolonged abuse of massive doses of AAS.
Author	Lindqvist, A.S.; Fahlke, C.
Title	Nandrolone decanoate has long-term effects on dominance in a competitive situation in male rats
Journal	Physiology and Behavior
Year/vol/no/pp	2005; 84; 1; 45-51
Abstract	The aim of the present study was to examine possible long-term effects of the anabolic androgenic steroid (AAS), nandrolone decanoate (ND), on dominance in a provoking and competitive situation in sexually matured male rats. The experimental group (n=10) received daily injections of ND [15 mg/kg in a volume of 1 ml/kg subcutaneous (s.c.) injection for 14 days]. During the corresponding period, the controls (n=10) were given daily injections of an oil vehicle (1 ml/kg s.c.). All animals were tested in a competitive situation at four occasions after the end of the treatment eriod (week 5, 8, 11 and 14). Water-deprived pairs of rats, consisting of one ND-treated rat and one control, had to compete for access to water. The results showed that the ND-treated rats approached the water spout significantly

	more often compared to the controls. During the competition tests, the ND-treated rats spent more time drinking, an effect that was prominent for 11 weeks after the end of the treatment period. The ND-treated rats also displayed more frequently piloerection than the controls. The results indicate that ND has long-term effect on dominance in a provoking and competitive situation.
Author	Magnusson, K.; Hallberg, M.; Hogberg, A.M.S.K.; Nyberg, F.
Title	Administration of the anabolic androgenic steroid nandrolone decanoate affects substance P endopeptidase-like activity in the rat brain
Journal	Peptides
Year/vol/no/pp	2006; 27; 1; 114-121
Abstract	The effect of the anabolic androgenic steroid, nandrolone decanoate, on substance P endopeptidase-like activity was examined in adult male Sprague-Dawley rats. Nandrolone decanoate (15mg/kg day) or oil vehicle (sterile arachidis oleum) were administered by intramuscular injections during 14 days. Substance P endopeptidase, a predominantly cytosolic enzyme, generates the bioactive N-terminal fragment substance P1-7 from the enzyme substrate substance P. Nandrolone decanoate significantly reduced the substance P endopeptidase-like activity compared to control animals in hypothalamus (43% reduction), caudate putamen (44%), substantia nigra (32%) and the ventral tegmental area (27%). It was previously reported that both hypothalamus and caudate putamen contained significantly higher levels of substance P after nandrolone administration. The higher concentration of substance P in these regions could to an extent be attributed to the reduction in substance P endopeptidase-like activity. This result elucidates the important role of peptidase activity in the regulation of the substance P transmitter system. The present study provides additional support for the hypothesis that alterations in the substance P system in certain brain areas may contribute to some of the personality changes reported in connection with AAS abuse.
Author	Martínez-Sanchis, Sonia; Arnedo, M. Teresa; Salvador, Alicia; Moya-Albiol, Luis; González-Bono, Esperanza
Title	Effects of chronic administration with high doses of testosterone propionate on behavioral and physiological parameters in mice with differing basal aggressiveness
Journal	Aggressive Behavior
Year/vol/no/pp	2003; 29; 2; 173-189
Abstract	The effects of testosterone propionate, an anabolic-androgenic steroid, on the behavior displayed during a social encounter by gonadally intact male mice were investigated. Animals were distributed into three groups according to their attack latency in a pre-screening test (high-, moderate-, and low- attacking mice) and each group received weekly injections of 60 or 120 mg/kg of testosterone or sesame oil for 10 weeks. Behavioral tests were then carried out. Afterwards, organs were weighed and blood samples collected in order to obtain hormonal data. Treatment had a differential impact on attack in the three groups of animals. Only the high-attacking testosterone-treated mice

	showed lower total duration of attack than their controls. Those that received 60 mg/kg spent more time exhibiting exploratory behaviors. As an index of the anabolic activity of the drug, all testosterone-treated mice had heavier kidneys and, as an index of the androgenic activity of testosterone propionate, they had heavier seminal vesicles, lighter testes, and showed higher testosterone levels in a dose-dependent way than their controls. Hence, the effect of treatment on peripheral physiological parameters was similar in all three groups whereas behavioral effects differed depending on basal aggressiveness, considered a characteristic of coping style.
Author	Medras, M.; Tworowska, U.; Jozkow, P.; Dumanski, A.; Dubinski, A.
Title	Postoperative course and anabolic-androgenic steroid abuse - a case report
Journal	Anaesthesia
Year/vol/no/pp	2005; 60; 1; 81-84
Abstract	It is estimated that 80% of weight lifters and body-builders take anabolic-androgenic steroids. Their long-term use is associated with a variety of pathological conditions and premature death. Anabolic-androgenic steroid abuse may lead to changes in the presentation and progression of some conditions. It remains unclear whether anabolic steroids should be given to patients with a history of abuse of these drugs who are to undergo surgery. We report on a fatal outcome following surgery in a 48-year-old weight lifter.
Author	Penatti, C.A.A.; Porter, D.M.; Jones, B.L.; Henderson, L.P.
Title	Sex-specific effects of chronic anabolic androgenic steroid treatment on GABAA receptor expression and function in adolescent mice
Journal	Neuroscience
Year/vol/no/pp	2005; 135; 2; 533-543
Abstract	Anabolic androgenic steroids are synthetic derivatives of testosterone designed for therapeutic uses, but now taken as drugs of abuse. Potential health risks associated with anabolic androgenic steroid abuse are believed to be higher in adolescents than in adults, but few studies have tested anabolic androgenic steroid effects in adolescent subjects or determined if effects of these steroids differ between females and males. We have studied GABAA receptor expression and function in the medial preoptic nucleus of mice chronically treated during adolescence with the anabolic androgenic steroid, 17@a-methyltestosterone. Three-week treatment did not elicit significant differences the expression of @a1, @a2 or @a5 subunit mRNAs in animals of either sex, although there was a trend toward decreases in all three subunit mRNAs in female mice, which was augmented and attained significance for the @a2 subunit mRNA in females treated for six weeks. Immunocytochemical analysis revealed that treatment with 17@a-methyltestosterone for 6 weeks also elicited a significant decrease in the number of @ a2-immunopositive neurons in female subjects. To test if anabolic androgenic steroid treatment also promoted changes in GABAA receptor function, spontaneous inhibitory synaptic currents were

	analyzed in adolescent animals treated for 3-4 weeks. This treatment regimen promoted a significant decrease in spontaneous inhibitory synaptic current frequency in female, but not male mice. Finally, anabolic androgenic steroid treatment was found to have no effect on the numbers of interneurons within the medial preoptic nucleus, as assessed by immunoreactivity for calcium binding proteins, suggesting that the decrease in the frequency of spontaneous inhibitory synaptic currents in female mice does not arise from an anabolic androgenic steroid-induced loss of interneurons. Taken together, our results indicate that chronic exposure to 17@a-methyltestosterone elicits significant changes in GABAergic transmission in the medial preoptic nucleus of female, but not male, mice effectively enhancing the sexually dimorphic nature of GABAergic transmission in a forebrain region crucial for the expression of aggression and sexual behaviors.
Author	Pinna Graziano; Costa Erminio; Guidotti Alessandro
Title	Changes in brain testosterone and allopregnanolone biosynthesis elicit aggressive behavior
Journal	Proceedings of the National Academy of Sciences of the United States of America
Year/vol/no/pp	2005; 102; 5; 2135-2140
Abstract	In addition to an action on metabolism, anabolic/androgenic steroids also increase sex drive and mental acuity. If abused, such steroids can cause irritability, impulsive aggression, and signs of major depression [Pearson, H. (2004) Nature 431, 500-501], but the mechanisms that produce these symptoms are unknown. The present study investigates behavioral and neurochemical alterations occurring in association with protracted (3-week) administration of testosterone propionate (TP) to socially isolated (SI) and group-housed male and female mice. Male but not female SI mice exhibit aggression that correlates with the down-regulation of brain neurosteroid biosynthesis. However, in female mice, long-term TP administration induces aggression associated with a decrease of brain allopregnanolone (Allo) content and a decrease (approximately =40%) of 5alpha-reductase type I mRNA expression. In spayed mice treated with TP, restitution experiments with progesterone and estrogen normalize brain Allo content and prevent aggression. Submicromolar doses of S-norfluoxetine (S-NFLX) that are insufficient to inhibit serotonin reuptake selectively increase brain Allo content and abolish TP-induced aggression. Our results support the view that TP-induced aggressive behavior is the result of a TP-mediated neurosteroid biosynthesis down-regulation that can be reversed by the S-NFLX-induced increase of brain Allo content.
Author	Ricci, L.A.; Grimes, J.M.; Melloni, R.H.
Title	Lasting changes in neuronal activation patterns in select forebrain regions of aggressive, adolescent anabolic/androgenic steroid-treated hamsters
Journal	Behavioural Brain Research
Year/vol/no/pp	2007; 176; 2; 344-352
Abstract	Repeated exposure to anabolic/androgenic steroids (AAS)

during adolescence stimulates high levels of offensive aggression in Syrian hamsters. The current study investigated whether adolescent AAS exposure activated neurons in areas of hamster forebrain implicated in aggressive behavior by examining the expression of FOS, i.e., the protein product of the immediate early gene c-fos shown to be a reliably sensitive marker of neuronal activation. Adolescent AAS-treated hamsters and sesame oil-treated littermates were scored for offensive aggression and then sacrificed 1 day later and examined for the number of FOS immunoreactive (FOS-ir) cells in regions of the hamster forebrain important for aggression control. When compared with non-aggressive, oil-treated controls, aggressive AAS-treated hamsters showed persistent increases in the number of FOS-ir cells in select aggression regions, namely the anterior hypothalamus and lateral septum. However, no differences in FOS-ir cells were found in other areas implicated in aggression such as the ventrolateral hypothalamus, bed nucleus of the stria terminals, central and/or medial amygdala or in non-aggression areas, such as the samatosensory cortex and the suprachiasmatic nucleus. These results suggest that adolescent AAS exposure may constitutively activate neurons in select forebrain areas critical for the regulation of aggression in hamsters. A model for how persistent activation of neurons in one of these brain regions (i.e., the anterior hypothalamus) may facilitate the development of the aggressive phenotype in adolescent-AAS exposed animals is presented.

Author	Rivera-Arce JC, Morales-Crespo L, Vargas-Pinto N, et al.
Title	Central effects of the anabolic steroid 17 alpha methyltestosterone in female anxiety
Journal	Pharmacology Biochemistry and Behavior
Year/vol/no/pp	2006; 84; 2; 275-281
Abstract	The androgen 17 alpha-methyltestosterone(17 alpha-meT) is one of the most commonly abused anabolic androgenic steroids (AAS). We assessed the impact of 17a-meT after bilateral infusion into the dorsomedial hypothalamus (DMH) in female anxiety. A paradoxical effect in Vogel conflict test (VCT) behavior was noted: while AAS infusion induced an increase in the latency to display the appetitive reaction of the task, it also increased the number of punished responses. No changes in elevated plus maze (EPM) behavior were noted. However, AAS infusion induced an increase in social interactions. Changes in social interactions were mimicked by muscimol infusion and counteracted by co-infusion of AAS plus the GABA(A) receptor (GABA(A)-R) antagonist GABAzine. A reduction of systolic blood pressure was registered after AAS infusion in the DMH. No changes in fluid intake or locomotor behaviors were noted. We conclude that the AAS 17 alpha-meT modulates distinct anxiety domains in females through a fast-acting mechanism.

Author	Rochcongar, P.; de Labareyre, H.; de Lecluse, J. ; et al.
Title	L'utilisation et la prescription

	des corticoides en medecine du sport Journal Science & Sports
Year/vol/no/pp	2004; 19; 3; 145-154
Abstract	Aims. - To evaluate the incidence of the corticoid regulation in sports medicine.Topics. - Corticosteroids injections are a frequently applied therapy in sports medicine, for tendinitis, articular sprains and overuse syndromes. However, there is no updated agreement about effectiveness, and clinical guidelines are poor. Optimal timing, dosage and injection volume, remain answered. Comparisons of efficacity with other treatments are not well established. At the present time, we cannot characterize the type of application (injection, pommade, iontophoresis...) in urine. Regarding anti-doping controls in France, during 2002, triamcinolone is the first corticosteroid discovered (81 cases), but bethametasone (26 cases) and prednisolone are also widely precribed. Perspectives. - Further researches are needed about type of prescription, effectiveness of therapy, time of elimination in reference with exercise, adverse effects. In our opinion, prescription of corticosteroids at present time cannot be widely justified.
Author	Rosano, A; Carletti, M; Donini, LM; et al.
Title	Doping and supplements: awareness and knowledge by the Italian general practitioners
Journal	Medicina Dello Sport
Year/vol/no/pp	2005; 58; 4; 265-272
Abstract	*Aim:* Substances abuse among non-competitive athletes is the most worrying aspect of doping, even though less sensational. General practitioners (GP) have a constant contact with the population and may play an important role in the prevention of doping. Objective of the study is to assess general practitioner knowledge of doping in sport, what kind of attitude they exhibit with respect to doping use and their availability to participate in campaigns against doping. *Methods:* A postal questionnaire was sent to a sample of 1,000 general practitioners in Italy. The questionnaire had four sections: demographic data, knowledge and awareness of doping, confront with doping in their practice, willingness of participating in campaigns. *Results:* The response rate was 26.9%. Of the respondents, 62.5% considered the possibility of positive doping test for prescribed drugs. Some 9.2% had directly encountered a request for prescription of doping agents and about 25% had been consulted about doping substances. Only 27.6% were able to correctly single but banned substance from a proposed list. Males among GPs showed better knowledge of doping. Knowledge about supplements is good: 85.4% is sufficiently prepared and only 5.0% mixed doping and supplements up. Most of GPs are aware that athletes take supplement to improve their performance. However, supplements are the most frequently prescribed substances to adults who practice sport. Most (70.5%) said that GPs may play a role in doping prevention, but only half of them considered themselves well prepared to participate in its prevention. *Conclusions:* GPs knowledge of which substances are prohibited in sports is poor. They are quite aware of the doping

widespread, but only a minority considers himself prepared. The position about supplements is controversial: it is known that the assumption is not aimed at integrating alimentary deficiency or metabolic dysfunctions, however GPs do not hesitate to prescribe supplements. GPs may play an important role in doping prevention. Tackling drug abuse in sport requires also education of doctors, at academic level and in continuous education programs.

Author	Saugy, M; Robinson, N; Saudan, C; et al.
Title	Human growth hormone doping in sport
Journal	British Journal of Sports Medicine
Year/vol/no/pp	2006; 40: 35-39 Suppl. 1
Abstract	*Background and objectives:* Recombinant human growth hormone (rhGH) has been on the list of forbidden substances since availability of its recombinant form improved in the early 1990s. Although its effectiveness in enhancing physical performance is still unproved, the compound is likely used for its potential anabolic effect on the muscle growth, and also in combination with other products (androgens, erythropoietin, etc.). The degree of similarity between the endogenous and the recombinant forms, the pulsatile secretion and marked interindividual variability makes detection of doping difficult. Two approaches proposed to overcome this problem are: the indirect method, which measures a combination of several factors in the biological cascade affected by administration of GH; and the direct method, which measures the difference between the circulating and the recombinant (represented by the unique 22 kD molecule) forms of GH. This article gives an overview of what is presently known about hGH in relation to sport. The available methods of detection are also evaluated. *Methods:* Review of the literature on GH in relation to exercise, and its adverse effects and methods of detection when used for doping. *Results and conclusion:* The main effects of exercise on hGH production and the use and effects of rhGH in athletes are discussed. Difficulties encountered by laboratories to prove misuse of this substance by both indirect and direct analyses are emphasised. The direct method currently seems to have the best reliability, even though the time window of detection is too short. hGH doping is a major challenge in the fight against doping. The effect of exercise on hGH and its short half-life are still presenting difficulties during doping analysis. To date the most promising method appears to be the direct approach utilising immunoassays.

Author	Sharpe K, Ashenden MJ, Schumacher YO
Title	A third generation approach to detect erythropoietin abuse in athletes
Journal	Haematologica-the Hematology Journal
Year/vol/no/pp	2006; 91; 3; 356-363
Abstract	*Background and Objectives:* Information derived from blood analyses can assist in the detection and/or deterrence of blood doping in sport. We investigated whether comparing an athlete's hematologic values against his or her own

historical baseline rather than population-derived thresholds enhanced the ability to detect blood doping.
Design and Methods: We developed an approach whereby an athlete's true baseline value could be estimated with just one prior blood test. We also estimated a universal value for within-subject variability for key hematologic parameters using the highest value obtained among four separate cohorts of male athletes including 80 elite rowers, 124 endurance-trained or team-sport subjects, 288 professional football players and 630 athletes competing at national or international level. The (individual) baseline and (universal) variability were then incorporated so as to define expected thresholds for subsequent blood tests. The sensitivity of our approach was obtained by analyzing data from 49 recreational athletes administered either recombinant human erythropoietin (n=37) or placebo (n=12).
Results: We found that removing within-subject variability by comparing new results against an historical baseline heightened the capacity to detect blood doping. It was possible to delineate the longitudinal changes in either hemoglobin (Hb) or the OFF-hr model score (an algorithm using both Hb and percent reticulocytes) caused by recombinant human erythropoietin treatment from the natural biological fluctuations found in subjects treated with placebo.
Interpretation and Conclusions: Our objective data supported the intuitive belief that longitudinal monitoring of athletes' blood profiles will help detect blood doping. This information could be used to instigate target-testing of suspicious athletes, or even warrant the exclusion from competition of athletes with aberrant variations in key hematologic values.

Author	Steensland, P.; Hallberg, M.; Kindlundh, A.; Fahlke, C.; Nyberg, F.
Title	Amphetamine-induced aggression is enhanced in rats pre-treated with the anabolic androgenic steroid nandrolone decanoate
Journal	Steroids
Year/vol/no/pp	2005; 70; 3; 199-204
Abstract	Aggression is one of the most commonly reported psychiatric side effects among anabolic-androgenic steroids (AAS) users. Furthermore, anecdotal stories say the aggression is even more profound when a current, or former, AAS-user consumes other drugs of abuse such as amphetamine and alcohol. In the present study, we examined the effect of amphetamine on defensive reactivity and defensive aggression in Sprague-Dawley rats after chronic AAS treatment (daily intramuscular [i.m.] injections with 15mg/kg nandrolone decanoate [ND] for 14 days). Defensive reactions in rodents occur in response to a real threat, but also to perceived provocation, for example, elicited by innocuous stimuli as reaction towards the experimenter. The defensive reactivity and aggression test employed in this study evaluates each rat's reaction towards four different stimuli (I: approach of a rod; II: startle to an air puff; III: poking with a rod at the flanks, and IV: capturing with a gloved hand) at two different occa-

	sions. Immediately following the ND treatment period, no change in the defensive response was found. Nevertheless, an amphetamine challenge given 3 weeks after the last ND or vehicle injection induced a marked increased defensive aggressive response in the ND, compared to vehicle-pre-treated rats. Both ND- and vehicle-pretreated rats receiving amphetamine were found to be more aggressive than comparable groups receiving a saline injection. It can be concluded that pre-treatment with ND modulates the behavioral response to amphetamine and induces long lasting changes in the behavioral response.
Author	Steensland, P.; Blakely, G.; Nyberg, F.; Fahlke, C.; Pohorecky, L.A.
Title	Anabolic androgenic steroid affects social aggression and fear-related behaviors in male pair-housed rats
Journal	Hormones and Behavior
Year/vol/no/pp	2005; 48; 2; 216-224
Abstract	This study examines the effect of chronic administration of the anabolic androgenic steroid nandrolone decanoate (ND) on dominant and subordinate male rats in a pair-housed condition. Pair-housed rats were assessed for dominance status based on their behavior and alterations in body weights. Throughout the study the rats were allowed limited social interactions on a daily basis. At all other times, a Plexiglas divider kept the rats separated, allowing olfactory and visual contact between the cage mates while preventing significant physical contact. One week into the study all subjects were subcutaneously implanted with a pellet that continuously infused either ND (15 mg/kg/day) or placebo for 21 days. Following the pellet implant, behavioral tests including reassessment for dominance status, and a conditioned fear test were conducted over a period of approximately 2 months to investigate possible long-term changes. The main finding is that during the allowed social interactions, the dominant ND-pretreated rats spent more time on highly aggressive behaviors than the dominant placebo-treated rats. In addition, the probability for highly aggressive behaviors was maintained for the ND-treated rats throughout the study, whereas it was decreased for the placebo-treated rats. The ND-treated subordinate rats showed less fear in a potential threatening situation compared to placebo-treated controls. These findings support the relatively long-term behavioral changes that have been seen in humans after abuse of ND and other anabolic androgenic steroid compounds.
Author	Svensson AI, Akesson P, Engel JA, et al.
Title	Testosterone treatment induces behavioral disinhibition in adult male rats
Journal	Pharmacology biochemistry and behavior
Year/vol/no/pp	2003; 75; 2; 481-490
Abstract	The importance of testosterone for impulsive-like behavior is unclear. Here we studied the effect of testosterone administration during 6 and 14 days (separate experiments) with one, three and five testosterone-filled silastic capsules implanted subcutaneously on shock-induced behavioral

	inhibition and on flunitrazepam-induced disinhibition in a modified Vogel's drinking conflict model in rats. Alleviation of shock-induced behavioral inhibition has been suggested to reflect impulsive-like behavior and/or anxiolysis. Treatment with the highest testosterone dose used for 6 (Experiment 1) and 14 (Experiment 3) days increased the number of shocks accepted. Testosterone treatment affected serum levels of testosterone and accessory sex organ weights. Flunitrazepam induced behavioral disinhibition in both testosterone-treated (for 14 days) and sham-treated rats. Moreover, testosterone treatment for 14 days resulted in enhanced GABA-induced Cl-36(-) uptake into synaptoneurosomes as compared to controls. In conclusion, testosterone produces behavioral disinhibition and may enhance brain GABA(A) receptor function.
Author	Sweeney, H. Lee
Title	Gene doping
Journal	Scientific American
Year/vol/no/pp	2004; July; 36-43
Author	Tamaki T, Shiraishi T, Takeda H, et al.
Title	Nandrolone decanoate enhances hypothalamic biogenic amines in rats
Journal	Medicine and Science in Sports and Exercise
Year/vol/no/pp	2003; 35; 1; 32-38
Abstract	*Purpose:* To identify possible mechanisms for an anabolic-androgenic steroid induced increase in aggressive behavior and work capacity, the levels of some biogenic amines considered to be closely related to a systemic hyper-adrenergic state were measured in selected regions of the brain. *Methods:* Wistar male rats were divided randomly into five groups: nontreated (control), oil-vehicle-treated (vehicle) or one of three therapeutic dose and 10- or 100-fold higher dose) anabolic-androgenic steroid-treated (steroid-1. -2, -3) groups. Rats in the steroid and vehicle groups were given a single dose of nandrolone decanoate or oil vehicle, respectively, one week before tissue sampling. The levels of norepinephrine (NE) and its metabolite, 4-hydroxy-3-methoxyphenyl-glycol (MHPG), serotonin (5-HT) and its metabolite, 5-hydroxyindole-3-acetic acid (5-HIAA) were measured in the cerebral cortex, hypothalamus and cerebellum by high-performance liquid chromatography. Immunostaining for c-fos was performed as a confirmation of increased neural activity. *Results:* The levels of NE and MHPG were increased by similar to2- and similar to7-fold in the hypothalamus of the steroid-2 compared with the control and vehicle groups. The levels of 5-HT and 5-HIAA were similar to40 and similar to50% higher in the steroid-2 compared with the control and vehicle groups. A significantly higher number of c-fos expressing neurons were observed in the periventricular region of the steroid-2 than the control and vehicle groups, indicating enhanced neuronal activity after nandrolone decanoate treatment. *Conclusions:* The present results, combined with previously reported findings of physical performance enhancement after anabolic-androgenic steroid treatment. are consistent with the interpretation that

	elevated levels of adrenergic and serotonergic amines in the hypothalamus could contribute to aggressive behaviors as well as improved physical performance.
Author	Thevis M; Schanzer W
Title	Gene doping
Journal	Mass Spectrometry Reviews
Year/vol/no/pp	2007; 26; 1; 79-107
Abstract	Owing to the sensitive, selective, and unambiguous nature of massspectrometric analyses, chromatographic techniques interfaced to various kinds of mass spectrometers have become the most frequently employed strategy in the fight against doping. To obtain utmost confidence in analytical assays, mass spectrometric characterization of target analytes and typical dissociation pathways have been utilized as basis for the development of reliable and robust screening as well as confirmation procedures. Methods for qualitative and/or quantitative determinations of prohibited low and high molecular weight drugs have been established in doping control laboratories preferably employing gas or liquid chromatography combined with electron, chemical, or atmospheric pressure ionization followed by analyses using quadrupole, ion trap, linear ion trap, or hyphenated techniques. The versatility of modem mass spectrometers enable specific as well as comprehensive measurements allowing sports drug testing laboratories to determine the misuse of therapeutics such as anabolic-androgenic steroids, stimulants, masking agents or so-called designer drugs in athletes' blood or urine specimens, and a selection of recent developments is summarized in this review.
Author	Thiblin I, Petersson A
Title	Pharmacoepidemiology of anabolic androgenic steroids: a review
Journal	Fundamental & Clinical Pharmacology
Year/vol/no/pp	2005; 19; 27-44
Abstract	Non-prescribed use of anabolic androgenic steroids (AAS) has been associated with a number of physical and psychiatric/behavioural complications, some of which are potentially lethal. Here, we review both observational and experimental studies on human subjects concerned with such side-effects. The only physical complication of AAS use that receives definitive support from such investigations is unfavourable changes in blood lipid profiles. Support for various psychiatric complications has also been provided by a number of cross-sectional studies, most involving comparisons between weight-training individuals who use or do not use AAS. Certain of these complications, in particular hypomania and increased aggressiveness, have been confirmed in some, but not all, randomized controlled studies. Epidemiological attempts to determine whether AAS use triggers violent behaviour have failed, primarily because of high rates of non-participation. Studies regarding the prevalence of AAS use in different populations typically report life-time prevalences of 1-5% among adolescents. However, the life-time prevalence (i.e. use on at least one occasion) is of doubtful relevance in attempting to estimate the number of individuals at

	risk for side-effects, as most of these complications appear to develop during prolonged use of AAS. Furthermore, it is reasonable to assume that the symptoms and signs of AAS use are often overlooked by healthcare professionals, so that the number of cases of possible AAS-related complications is virtually unknown. These limitations, together with an apparently low prevalence of prolonged AAS use among the general population, indicate that future epidemiological research in this area should focus on retrospective case-control studies and, perhaps, also on prospective cohort studies of populations selected for a high prevalence of AAS use, rather than attempting to perform large-scale population-based studies.
Author	Vidal, P.P.
Title	Stress, corticoids and drug self-administration
Journal	Science & Sports
Year/vol/no/pp	2005; 20; 4; 226-228
Abstract	*Introduction:* - Corticoids have an action on the central nervous system via receivers with high and low affinity. *Synthesis of the facts:* - On animal models (rodent), the self-administration of psychoactives substances, like cocaine, the amphetamine, the opioides, morphine alcohol, increases in the situations of stress or after corticoid administration acute, then returns in a basal state, on man. The chronic administration of corticoids or the repeated stresses involve, via a high and persistent cortisolemy a reinforcement of this effect and its fast reinstalment after weaning. *Conclusion:* - These results obtained on animal models are alarming if it were to be checked, even partially, at the man. The prevalence of stressing situations and long term treatments by corticoids in the practice of sport on a high level would be likely to be worsening factors and largely ignored while taking psychoactive substances, whether for entertaining or doping reasons.
Author	Wesson, D.W.; McGinnis, M.Y.
Title	Stacking anabolic androgenic steroids (AAS) during puberty in rats: A neuroendocrine and behavioral assessment
Journal	Pharmacology Biochemistry and Behavior
Year/vol/no/pp	2006; 83; 3; 410-419
Abstract	Anabolic androgenic steroid (AAS) abuse is increasing in teenagers. We examined the effects of stacked AAS in adolescent male rats. Stacking, in which multiple AAS are taken simultaneously, is commonly employed by humans. Beginning at puberty gonadally intact male rats received testosterone, nandrolone, or stanozolol. Additional groups received stacked AAS: testosterone + stanozolol, nandrolone + stanozolol, or nandrolone + testosterone. Injections continued during tests for sexual behavior, vocalizations, scent marking, partner preference, aggression and fertility. Body and reproductive tissue weights were taken. Sexual and aggressive behaviors were increased by testosterone yet inhibited by stanozolol; nandrolone had no effect. Stacking testosterone with stanozolol prevented the inhibitory effects of stanozolol. Body weight was decreased by testosterone and all stacked AAS. Cell nuclear androgen

	receptor binding in brain was significantly increased in nandrolone males and decreased in stanozolol males; testosterone males were slightly higher than controls. Androgen receptors in stacked groups were intermediate between individual AAS suggesting that stanozolol competed with other AAS for androgen receptors despite its low affinity. The results indicate that stacking AAS influences the effects of individual AAS on behavioral and endocrine measures, and levels of androgen receptor occupation are not directly correlated with AAS effects on behavior.
Author	Wood, Ruth I
Title	Anabolic Steroids: A Fatal Attraction?
Journal	Journal of Neuroendocrinology
Year/vol/no/pp	2006; 18; 3; 227-228
Abstract	Anabolic-androgenic steroids (AAS) are widely abused, but the potential for dependence and addiction remains unclear. Recent studies from our laboratory have shown that male and female hamsters will voluntarily self-administer testosterone and other AAS. Furthermore, we have observed fatal androgen overdose during self-administration. This suggests that AAS are potentially addictive, independent of their effects on muscle mass or athletic performance.

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