

# Human Enhancement

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# Plan

1. Definition
2. Ethics
3. Empirical data
4. Case studies

# 1. Definition

- What is *human enhancement*?

# Situation 1: Studies

- A drinks coffee
- B drinks guarana
- C wears glasses to read the slides on the big screen
- D has attention deficit disorder and takes Ritalin
- E takes Ritalin to work better, but does not have attention deficit disorder
- F records the lecture on their phone to listen to again if necessary
- Are A, B, C, D, and E doing similar things?
- Are all these actions acceptable from a moral standpoint?



# Situation 2: Sports competition

- A trained at altitude
- B took vitamins and other dietary supplements
- C has lighter and more aerodynamic equipment than the others
- D takes steroids
- E takes anti-inflammatory drugs for pain/injury
- F says a special prayer before the race to win
- Do A, B, C, D, E, and F do similar things?  
similar actions?
- Are all these actions acceptable  
from a moral standpoint?



# Enhancement/improvement

- Definition:
  - "The term 'human enhancement' refers to medical interventions that are not intended to treat disease, but to improve non-pathological characteristics." (Swiss Academy of Sciences 2012)
  - "Biomedical interventions that are used to improve human form or functioning beyond what is necessary to restore or sustain health" (Juengst and Moseley 2019)

# Key elements

- Intervention/technique
- Neither pathological nor preventive
- Improvement
  
- Are these criteria relevant?

# Interventions

- Pharmacological substances that improve:
  - Cognitive function (alertness, attention, concentration, memory). E.g., Ritalin, modafinil, caffeine, etc.
  - Psychological function (mood, sleep). E.g., antidepressants, oxytocin
  - Physical performance: e.g., steroids
- Surgery (cosmetic, enhancement, etc.)
- Genetic interventions
- Brain stimulation
- ...

# Interventions

What counts as an intervention?

- Coffee?
- Meditation?
- Training at altitude?

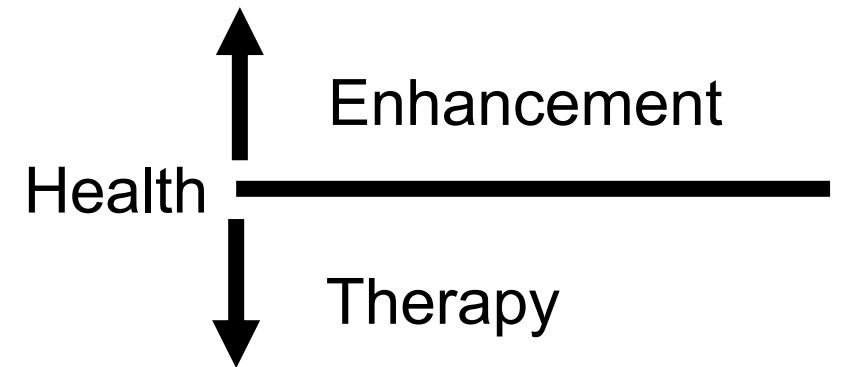


# Interventions

- Enhancement:
  - In general, medical and technical interventions
  - Excluding training and other practices, herbal teas, etc.
  - Excluding placebos (therefore raises the question of the effectiveness of interventions)

# Beyond health

- Enhancement differs from therapy and prevention
- Goes beyond a therapeutic effect
- What does that mean?



# Therapy

- What is therapy?
  - Is the goal of medicine to eliminate disease or to promote health and well-being?
- A defect in relation to:
  - Compared to the average person?
    - But the average person is not necessarily in "good health."
    - Most people are above or below average
  - At optimal functioning? What does optimal mean in this context?
- Examples:
  - Speed of an electric wheelchair
  - Injured champion running at the same speed as the average person



# Health

The preamble to the WHO Constitution defines health as follows:

- "Health is a state of complete physical, mental, and social well-being, and not merely the absence of disease or infirmity."
- According to this definition, who is healthy?
- Is everything that promotes health therapeutic?

# Prevention

- Interventions aimed at preventing the onset of a disease or health problem
- Enhancement: aims instead to improve performance or appearance

# Enhancement

- What assets are we looking for?
- Who decides?
- Importance of the sociocultural context
  - Excluding poisons, instruments of torture, etc.
  - Is increasing production or decrease in emotions are improvements? (e.g., Brave New World)



# What is enhancement?

- (Almost) no intervention constitutes enhancement in itself—it depends on the use. (embryo selection, Ritalin, surgery, etc.)
- None of the three criteria (intervention, improvement, beyond health) are precise
- Depends on the social context (what is considered normal, what is seen as an improvement)
- Problematic for a moral evaluation of enhancement in general

# Neuro-enhancement

- Enhancements aimed at improving cognitive and emotional abilities
- Drug interventions
- Brain stimulation (deep brain stimulation and transcranial stimulation)
- Brain-computer interface

# Case: Biohacking

- Is biohacking enhancement?
- Jacob is a biohacker. To improve his health and performance, he takes various dietary supplements, follows the Wim Hof method, and adapts his exercise routine based on the results of an app that analyzes his health data on a daily basis.
- Can we say that this is enhancement?
- What if the goal is to delay aging? (anti-aging)

# Case: Birth control pill

- Albertine is a young woman who has started menstruating. She asks her doctor to prescribe her birth control pills. She is sexually active and does not want to have children at this time. She would also like to avoid hormonal fluctuations and her mild premenstrual syndrome.
- Is this enhancement?

# 2. Ethics

- Is it morally permissible to use enhancements?
- What are the ethical issues?



# Positions

- Liberal: Everyone should be free to decide whether they want to use enhancements.
- Conservative: There are risks associated with the use of enhancements; their use should be prohibited/regulated



# Levels

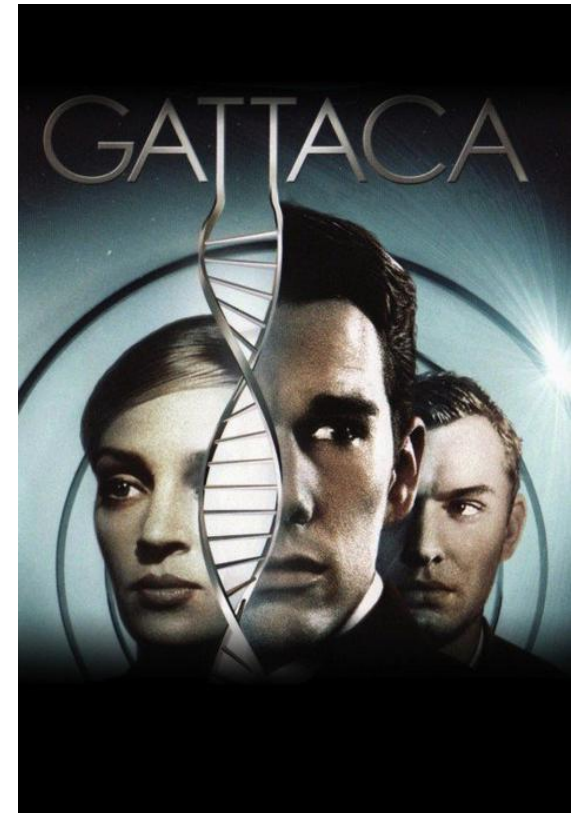
- Individual
  - Choose for yourself, your child
- Societal
  - What happens when the use of enhancement becomes widespread?
- Metaphysical
  - Issues related to human nature
- Professional (medical)

# Individual level

- Personal freedom
- Effectiveness and risks (see empirical data)
- Problem for minors

# Societal level

- Unfair advantage
- Creates inequalities
- Stigmatization of people who are not "enhanced"
- But what is the difference between the advantages of enhancement and other inequalities?



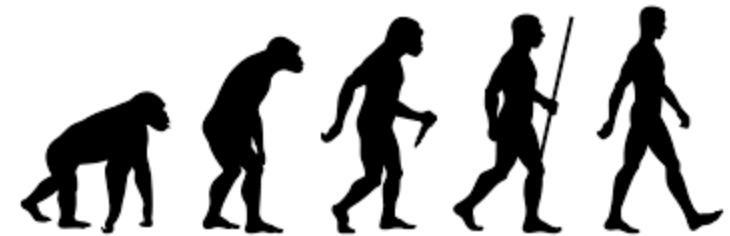
# Freedom

- Risk of coercion
  - If everyone uses enhancers, you have to use them too in order to avoid underperforming
  - Risk that the use of enhancers will be required (by employers, e.g., the military)



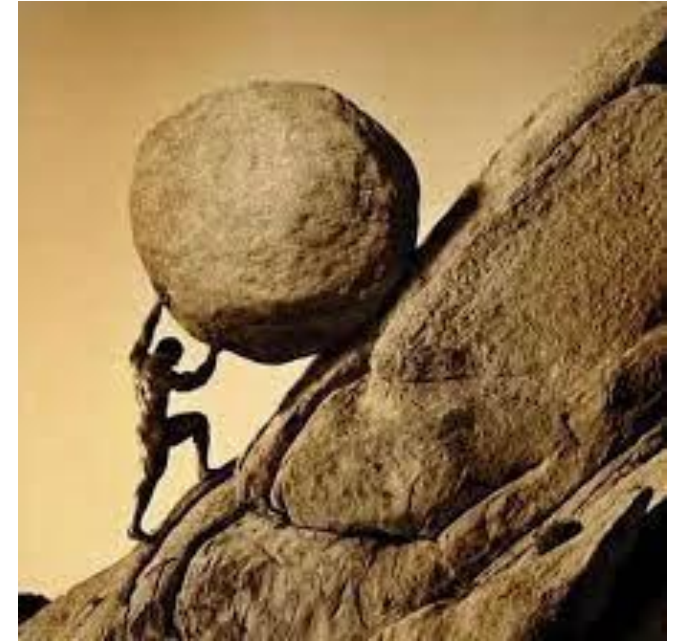
# Metaphysical level

- Can enhancement change what it means to be human?
- Dehumanization (using humans as objects)
- Attack on humanity, on the essential characteristics of the human species
  - Removing humans' vulnerability and limitations
- Changes to the human genome
- Dignity



# Authenticity

- More authentic successes?
- Take away the credit
- The way we do things is important
- E.g.: Helicopter skiing at the top of the mountain vs. climbing the mountain
- Difference between sports competition and studies?



# The natural argument

- It is not natural to use enhancements
- Do not change the human species in an "unnatural" way
- Don't play God
- Beware of fallacies!

# Human evolution

- Should we evolve?
- In what direction?
- Do we have a duty to improve ourselves/the human species?

# Transhumanism

- A movement that advocates the use of science and technology to enhance human performance in order to improve the human condition.

# Eugenics

- Enhancement?
- Aims to improve the human species
- Political and ideological project
- Restriction of freedoms
- Interference in private life

# Medical ethics

- Is this the role of medicine?
- Do doctors have a duty/right to prescribe non-therapeutic substances?
- Medicine and service provision
  - Autonomy, beneficence, justice



## Une médecine pour les personnes en bonne santé ?

Analyses et recommandations  
concernant le human enhancement

Rapport du groupe de travail «Human Enhancement»  
à l'attention des Académies suisses des sciences

It is certainly part of medicine's remit to help individuals adapt as successfully as possible to the demands of their environment, i.e., to conform to norms. In this context, however, medicine should not be complicit in promoting questionable social norms. Rather, it is also necessary to examine the desired interventions in terms of their persistence for personal well-being and to encourage those concerned to critically question excessive demands and, where appropriate, to seek to bring about a change in environmental conditions." (2012)

# Doping

- Is it cheating?
- Does it create inequality?





"There is nothing wrong with the use of 'unnatural' enhancements in sports. Indeed, sports depend thoroughly on the non-natural: on tennis rackets, poles for vaulting, skis for skiing, hi-tech running gear, fancy wetsuits, and, in addition, on protective gear of many kinds. Both steroids and boxing gloves are unnatural. The latter are good and should be, as they are, required; the former are dangerous and should be banned."

Martha Nussbaum, in *Human Dignity and Bioethics: Essays Commissioned by the President's Council on Bioethics*

# Enhancement and morality

- Relevance of the concept?
- Do interventions that qualify as "enhancers" have a specific moral character?
- What is the difference between meditating and taking a neuro-enhancer?
- Fundamental difference with treatment for a medical condition?
- Importance of social context and what is accepted as "normal"

# 3. Empirical data

- Are enhancements used?
- In your opinion, what percentage of students use an illicit or prescription substance at least once to enhance their performance?

# To Dope or Not to Dope: Neuroenhancement with Prescription Drugs and Drugs of Abuse among Swiss University Students

Larissa J. Maier<sup>1\*</sup>, Matthias E. Liechti<sup>2</sup>, Fiona Herzig<sup>3</sup>, Michael P. Schaub<sup>1</sup>

- >6,000 students
- 13.8% had already used prescription substances (7.6%) or drugs (including alcohol) at least once for the purpose of "neuroenhancement"
- Goals:
  - Improve learning (66.2%),
  - To aid relaxation or sleep (51.2%)
  - Reduce nervousness (39.1%)
  - Coping with performance pressure (34.9%)
  - Increase performance (32.2%)
  - To experiment (20%). “
- More prevalent among older, more stressed students who had already used illicit drugs
- Much less frequent than for "soft enhancers" (coffee, energy drinks, vitamins, etc.)

# Neuroenhancement among Swiss Students – A Comparison of Users and Non-Users

Authors

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- >1000
- 6.2% had used drugs for non-therapeutic purposes and 4.7% for study purposes
- Profile:
  - More often men
  - Consider religion less important
  - More experience with drugs
- Ritalin was the most commonly tested substance
- People who used products to increase concentration (coffee, Red Bull, guarana, cigarettes) were more likely to use enhancements.

# Prevalence of and motives for pharmacological neuroenhancement in Switzerland—results from a national internet panel

Larissa J. Maier, Severin Haug & Michael P. Schaub

Swiss Research Institute for Public Health and Addiction (ISGF), Associated Institute at the University of Zurich and WHO Collaborating Centre, Zurich, Switzerland

- 2015 study
- Online survey
- >10,000
- 4% had previously used substances for neuroenhancement and 2.1% had used them in the past year
- 3.1% had used substances to alter their mood, 1.4% to improve cognition. (0.5% both)
- More common among students

## Prevalence of Doping Use in Elite Sports: A Review of Numbers and Methods

Olivier de Hon · Harm Kuipers ·  
Maarten van Bottenburg

- Difficulty obtaining reliable data on doping
- Doping control tests estimate that there is 1-2% doping annually
- The journal estimates between 14-39%

Chapter 3  
Psychopharmacological Neuroenhancement:  
Evidence on Safety and Efficacy

Dimitris Repantis

2013

- "Based on meta-analyses, it can be shown that expectations regarding the effectiveness of these drugs exceed their actual effects, as has been demonstrated in single- or double-blind randomized controlled trials. According to these data, it seems that the strongest reason not to use prescription drugs for enhancement purposes at the moment is the lack of evidence both for their effectiveness and their long-term safety in healthy people."

## Smart drugs and neuroenhancement: what do we know?

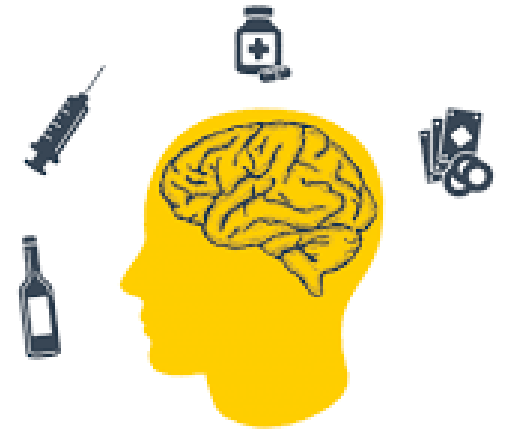
Massimiliano Esposito<sup>1</sup>, Giuseppe Cocimano<sup>1</sup>, Federica Ministrieri<sup>1</sup>, Giuseppe Li Rosi<sup>2</sup>,  
Nunzio Di Nunno<sup>3</sup>, Giovanni Messina<sup>4</sup>, Francesco Sessa<sup>4,\*;†</sup>, Monica Salerno<sup>1,\*;†</sup>

2021

“There are conflicting opinions, in fact, regarding their actual functioning and benefit; it is not known whether the benefits reported by consumers are due to the drugs, the placebo effect, or a combination of these. The real prevalence is underestimated: it is important that the scientific community focus on this issue with further studies on animal models to validate their efficacy.”

# Direct risks

- For the person using the enhancer:
  - Side effects?
  - Addiction? (Heinz et al. 2011)



# Enhancement and empirical data

- Many articles around 2010
- Reproducibility crisis
- Little empirical research since then
- Lack of scientific evidence
- RCTs less justified for enhancement than therapy



# Assessment

- Lack of knowledge about the risks and effectiveness of enhancements
- Risks to freedom?
- How can we avoid creating new inequalities?
- Opportunity for human improvement?
- Fundamental difference from other technologies or conservatism?

# 4. Case studies

- Disenhancement
- Emotion pill
- BCI/brain stimulation

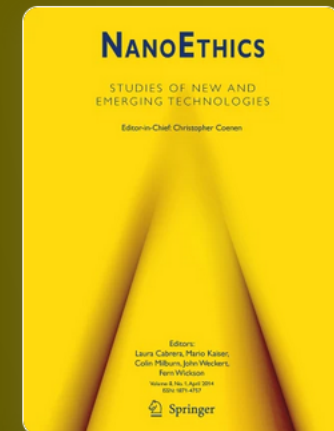
# 4. Case study

[Home](#) > [NanoEthics](#) > Article

## The Opposite of Human Enhancement: Nanotechnology and the Blind Chicken Problem

Original Paper | Published: 22 November 2008

Volume 2, pages 305–316, (2008) [Cite this article](#)



[NanoEthics](#)



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DE GENÈVE

# Case study

> [Am J Bioeth.](#) 2007 Sep;7(9):12-20. doi: 10.1080/15265160701518474.

## **Propranolol and the prevention of post-traumatic stress disorder: is it wrong to erase the "sting" of bad memories?**

[Michael Henry](#)<sup>1</sup>, [Jennifer R Fishman](#), [Stuart J Youngner](#)

Affiliations + expand

PMID: 17849331 DOI: [10.1080/15265160701518474](#)

# Case study



# Legal framework

- **Constitution**

-  **Chapter 1 Fundamental Rights**

-  **Art. 7 Human dignity**

Human dignity must be respected and protected.

-  **Art. 10 Right to life and to personal freedom**

<sup>1</sup> Every person has the right to life. The death penalty is prohibited.

<sup>2</sup> Every person has the right to personal liberty and in particular to physical and mental integrity and to freedom of movement.

<sup>3</sup> Torture and any other form of cruel, inhuman or degrading treatment or punishment are prohibited.

➔ Importance of consent (also Art. 28 Const.)

# Constitution

## - **Art. 8** Equality before the law

<sup>1</sup> Every person is equal before the law.

<sup>2</sup> No person may be discriminated against, in particular on grounds of origin, race, gender, age, language, social position, way of life, religious, ideological, or political convictions, or because of a physical, mental or psychological disability.

<sup>3</sup> Men and women have equal rights. The law shall ensure their equality, both in law and in practice, most particularly in the family, in education, and in the workplace. Men and women have the right to equal pay for work of equal value.

<sup>4</sup> The law shall provide for the elimination of inequalities that affect persons with disabilities.

- Primarily the relationship between the state and its citizens, but also indirect horizontal effects

# Constitution

## - **Art. 118** Health protection

<sup>1</sup> The Confederation shall, within the scope of its powers, take measures for the protection of health.

<sup>2</sup> It shall legislate on:

- a. the use of foodstuffs as well as therapeutic products, narcotics, organisms, chemicals and items that may be dangerous to health;
- b.<sup>78</sup> the combating of communicable, widespread or particularly dangerous human and animal diseases; it shall in particular prohibit any form of advertising for tobacco products from reaching children and adolescents;<sup>79\*</sup>
- c. protection against ionising radiation.

# Constitution: Reproductive Medicine

## - **Art. 119** Reproductive medicine and gene technology involving human beings

<sup>1</sup> Human beings shall be protected against the misuse of reproductive medicine and gene technology.

<sup>2</sup> The Confederation shall legislate on the use of human reproductive and genetic material. In doing so, it shall ensure the protection of human dignity, privacy and the family and shall adhere in particular to the following principles:

- a. All forms of cloning and interference with the genetic material of human reproductive cells and embryos are unlawful.
- b. Non-human reproductive and genetic material may neither be introduced into nor combined with human reproductive material.
- c.<sup>82</sup> The procedures for medically-assisted reproduction may be used only if infertility or the risk of transmitting a serious illness cannot otherwise be overcome, but not in order to conceive a child with specific characteristics or to further research; the fertilisation of human egg cells outside a woman's body is permitted only under the conditions laid down by the law; no more human egg cells may be developed into embryos outside a woman's body than are required for medically-assisted reproduction.
- d. The donation of embryos and all forms of surrogate motherhood are unlawful.
- e. The trade in human reproductive material and in products obtained from embryos is prohibited.
- f. The genetic material of a person may be analysed, registered or made public only with the consent of the person concerned or if the law so provides.
- g. Every person shall have access to data relating to their ancestry.

# Therapeutic Products Act (TPA)

## - Art. 4 Definitions

<sup>1</sup> In this Act:

- a. *Medicinal products* means products of chemical or biological origin which are intended or claimed to have a medicinal effect on the human or animal organism, in particular in the diagnosis, prevention or treatment of diseases, injuries and handicaps; blood and blood products are also considered to be medicinal products;
- b.<sup>18</sup> *Medical devices* means products, including instruments, apparatus, equipment, in vitro diagnostics, software, implants, reagents, materials and other goods or substances which are intended or claimed to have a medical use and whose principal effect is not obtained with a medicinal product;

# Dietary supplements

- "In its message of January 30, 1989,<sup>36</sup> concerning this law, the Federal Council notes that a product is not subject to food control when it is promoted or sold as a medicine, even if its other properties mean that it is essentially a "foodstuff" and consumed as such. " LPT Message, FF 1999 3151, p. 3167.

# Ordonnance du DFI sur les compléments alimentaires

## - **Art. 1 Compléments alimentaires**

Les compléments alimentaires sont des denrées alimentaires dont le but est de compléter le régime alimentaire normal. Ils constituent une source concentrée de vitamines, de sels minéraux ou d'autres substances ayant un effet nutritionnel ou physiologique seuls ou combinés, commercialisés sous forme de doses.

<sup>3</sup> Ils peuvent contenir:

- a. les vitamines et les sels minéraux répertoriés à l'annexe 1, partie A, aux conditions qui y figurent;
- b. d'autres substances, dans le respect des restrictions figurant à l'annexe 1, partie B;
- c. les substances qui remplissent l'une des conditions suivantes:
  1. elles sont autorisées en vertu de l'ordonnance du DFI du 16 décembre 2016 sur les nouvelles sortes de denrées alimentaires<sup>2</sup> et peuvent être utilisées dans les compléments alimentaires,
  2. elles ont été autorisées par l'OSAV comme nouvelles sortes de denrées alimentaires;
- d. d'autres denrées alimentaires; les let. a à c sont réservées.

# Foodstuffs Act (FSA)

-  **Section 1 Foodstuffs**

-  **Art. 7 Food safety**

<sup>1</sup> Only safe foodstuffs may be placed on the market.

<sup>2</sup> Foodstuffs are deemed to be unsafe if it must be assumed that they:

- a. are harmful to health; or
- b. are unsuitable for human consumption.

<sup>4</sup> The Federal Council shall stipulate the requirements for food safety.

<sup>5</sup> It may introduce a licensing or notification requirement for:

- a. novel foods;
- b. foodstuffs intended for people with special nutritional requirements due to health reasons;
- c. foodstuffs that are advertised as having special nutritional-physiological or other physiological effects;
- d. foodstuffs from animals that have been administered unlicensed medicinal products in clinical trials.

# Physicians

- TPA

-  **Art. 26** Principle of prescription, dispensing and application<sup>89</sup>

<sup>1</sup> The recognised rules of pharmaceutical and medical sciences must be respected when prescribing, dispensing and using medicinal products, and the principles of the corresponding therapy approach must be respected when prescribing, dispensing and using complementary medicines without indications. The Federal Council may specify these rules in more detail.<sup>90</sup>

- Authorization from Swissmedic
- Off-label prescribing: legal but the doctor is liable

# Health insurance

- LAA (accident insurance)

-  **Art. 54** Limites du traitement

Lorsqu'ils soignent des assurés, leur prescrivent ou leur fournissent des médicaments, prescrivent ou appliquent un traitement ou font des analyses, ceux qui pratiquent aux frais de l'assurance-accidents doivent se limiter à ce qui est exigé par le but du traitement.

- LAMal

-  **Art. 25** Prestations générales en cas de maladie

<sup>1</sup> L'assurance obligatoire des soins prend en charge les coûts des prestations qui servent à diagnostiquer ou à traiter une maladie et ses séquelles.

# Conclusion

- No ban on enhancement
- But restrictions in certain areas
- Health protection
- Not covered by insurance
- Responsibility of the physician