Boxing should not be banned

The evidence

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Boxing is a dangerous sport
It can be Brutal

...or Brilliant
But Be under no illusion........

It is *always* dangerous
Boxers get injured

Sometimes seriously injured

Boxers get killed
Sub classification

- Acute injury : Sub dural haemorrhage
- Chronic injury : Dementia Pugilistica
He died chasing his dream

This has been a sad week for boxing, with the death of super-bantamweight Bradley Stone (left) after his British title fight with Richie Venton at York Hall. There have been predictable calls for the sport to be outlawed, and the British Medical Association has reiterated its call for a complete ban.

That would be to insult the memory of a young man who loved his sport, and who was probably never happier or prouder in his life than on the night when he fought for the Lonsdale Belt.

Boxing will go on, and other young men like Bradley will chase their dreams. That is their right, and their choice, even the price is sometimes cruelly high.

Read HARRY MULLAN on pages 2-3
Current AMA Policy Related to Boxing

The AMA supports the elimination of both professional and amateur boxing as sports, including the venue of the Olympic Games (Policies H-470-908, reaffirmed in 1996, and H-470.973, AMA Policy Compendium).
The BMA will continue to campaign for a total ban on boxing, while concentrating on areas such as boxing among children and the armed forces and doctors' involvement in the sport.
1. The AMA opposes all forms of boxing.

2. The AMA recommends to the International Olympic Committee and the Australian Commonwealth Games Association that boxing be banned from both the Olympic and Commonwealth Games.
Is Boxing so dangerous that it justifies this unique opposition?

Do most medical practitioners care?

Will the fate of boxing depend on who wins the confidence of the public?
“Beyond the physical brutality of this pretended sport, which trains youngers of school age in mutual assault, its repulsiveness lies in its opposition to every commendable concept of our civilization”

Unterharnscheidt
Rev Neurol (Barc) 1995; 23 (123): 1027-1032
“Boxing should be banned in civilized countries”

Lundberg. JAMA 255 (18) 2843-5, 1986
“It is a barbaric enterprise reminiscent of dog fighting...the action of the BMA stems from a different more humane set of values that most of us hold”

Moutoussis. Med Conf Surviv 1996 12 (1) 62-64
The Boxing Debate
“in certain circumstances, as with amateur boxing, action may need to be taken on the basis of inadequate or incomplete data..”

- Medical /scientific fact
- Personal opinion
Figure 8, page 21 “The Boxing Debate”
Case one: Corsellis et al 1973
“Conclusive evidence” or “selective editing”? 

- Case one: Boxed age 11-25 ~ 400 bouts
- Lost a handful, one bout stopped
- British/World champion
- Stopped boxing, “Life became hectic”
- “wenched, drank and gambled heavily”
- Car accidents x 3
- 3 months in hospital following last crash, severe scalp laceration

- Corsellis et al. (1973). Psychological Medicine 3, 270-303
In the absence of this information the reader may be led to believe that the histopathology is representative of all boxers

Unbiased science?

Selective use of data?
The last 100 years have seen dramatic changes in the diseases that affect mankind, especially in the developed world. In the USA in 1900, infections were the leading causes of death, and mean life expectancy at birth was 49.2 yrs. By 2000, heart disease was now the leading killer in the USA and life expectancy had increased to 76.5 yrs.

Mannino, D. Eur Respir J 2005; 26:189
Is it acceptable to use this data to procure a ban on modern boxing?

Is the manner in which this data has been presented acceptable?
Risk of Acute injury

“Boxing has acute injury rates comparable to, and often lower than, those found in other contact and non-contact sports.”

Risk of Chronic injury

How you quantify the risk involved depends on what data you use, and how you interpret that data.
Making the findings fit

- 67 year old male
- Amyotrophic lateral sclerosis + Dementia
- Clinical condition attributed to boxing
- Not fully supported by evidence presented

Septi Pellucidi: Born to box?

- CSP is seen in Tourettes, schizophrenia etc

- “Professional boxers have a high prevalence of cognitive dysfunction to begin with...a select population with higher prevalence of CSP”

- “CSP may also result in behavioural characteristics making pugilism a more attractive choice”

Five Boxers. Spillane, J.
BMJ. Nov 1962

Brains of Boxers. Payne, E. (1968)
Neurochirurgia (Stuttg) 11, 173-78.

Neurological disease in Boxers
Mawdsley, C. Ferguson, F.R. (1963)
Lancet. October 19795-801
If you want to find evidence of Brain damage in boxers, the best place to look is in brain damaged boxers

Patients with psychiatric morbidity
Many in institutionalised care

Not representative of all boxers
Animal Models

- Unterharnscheidt
- Live animal models
- 200-400 G  100-400,000 rad/sec
- Extrapolation from “student model”
- Lacks scientific reasoning
“Under the given conditions, it was found that the use of 6 oz gloves could result in head accelerations of more than 100 G”

Unterharnscheidt 1970
Texas rep Biol Med 28:4 421-495
Figure 6. This figure shows the measurements of acceleration using boxing gloves of different weight (ordinate, acceleration expressed in g; abscissa: ounces (oz) of gloves). In serial testing, the gloves' material showed 'fatigue' or 'fading' of its elastic qualities, and consequently the acceleration measurements rose. (From F. Unterharnscheidt and K. Sellier 1971)
Chronic Brain Damage in Boxing

Punch drunk syndrome
Harrison S. Martland
“We are placed in the position of accepting a series of objective symptoms described to us by laymen”

“A fight promoter whose ability to judge the physical condition of fighters is unquestionable has given me the names of twenty-three fighters he considers punch drunk....I have examined five “

Martland. 1928, JAMA 91(15) 1103-7
Assessing Chronic Brain Damage in Boxing

- Histopathological
- Electrophysiological
- Radiology
- Physical/Neurological examination
- Neuropsychology
Histopathology: Summary

- A highly select cohort. We know a lot about the few...around 30 brains examined over the years.

- Not Boxers in General.

- Defined pattern of changes
  - Septum pellucidum,
  - Cerebellum,
  - Substantia nigra
  - Neurofibrillary tangles
E.E.G. Summary

- The EEG appears to have little value either as a screening tool for predicting development of encephalopathy, or as a diagnostic tool for demonstrating established disease.

- Contradictory data on EEG findings and evidence of chronic brain damage in amateurs and professionals.
EEG: Summary

- Johnson 1969
  "The lesions responsible for encephalopathy are probably located in two main areas"

- Neurological features in the upper brain stem

- Psychiatric features in the Hippocampal-Fornical system

- The scalp EEG reflects neural disorganization in the Cerebral cortex... Punch drunk syndrome is largely sub-cortical"
Radiology: Summary

- Data obtained from many of these studies cannot be extrapolated to general boxing population

- Methodological limitation, sample size, selection bias, lack of controls, cross sectional nature of studies

- Conglomeration amateur / professional
Radiology: Summary

- Studies show: Cortical atrophy
  Ventricular atrophy
  Cavum Septum Pellucidum.

- Ventricular enlargement appears more prominent than sulcal enlargement

- Despite small numbers, occupational exposure appears related to increased abnormalities in professionals
Neurology: Summary

- Pyramidal/Extrapyramidal/Cerebellar dysfunction in professionals
- Prevalence varies 0% - 55%
- Exposure (length of career and number of fights) may correlate with dysfunction. ?? sparring
Apolipoprotein E ε 4
Jordan. B: 1997

- APOE ε 4 Allele associated with increase severity of chronic neurologic deficits in high exposure boxers
- ?? Screening programmes => ethical nightmare
Serum S100B: Predictor?

- post head injury, regulation of Calcium flux and astrocytic proliferation

- Levels rise in Boxing and running (Otto, 2000)

- Serum S100B is a sensitive biomarker for early prediction of development of raised ICP and fatal outcome following acute brain injury (Petzold, 2002)

- Any use in Boxing??
Neuropsychometric summary

- Neuropsychometric testing appears to be a sensitive method of identifying brain damage
- Non specific means of assessing damage
- Results from studies to date have been inconsistent
Neuropsychometric Controlled Studies

- No evidence of Neuropsychometric deficit in amateur boxing, during specific studies

- Long exposure in amateurs may lead to deficiencies in some individual test results

- Evidence of dysfunction that correlates with exposure in professionals
Amateur Boxing does not lead to The development of a chronic brain syndrome

Some professional Boxers may show Evidence of chronic neurological Impairment related to exposure
The Challenge to Boxing

- Identify which professional boxers are at risk
- Find reliable and reproducible tests to determine the risk
- Find a means of persuading the boxers and promoters of who and when to stop
There is not enough medical evidence to call for an outright ban on boxing.

Boxing is a dangerous sport that can make you dead or damaged.

The arguments for and against a ban must be based on science.
• Disguising a moral argument as scientific Fact, thinly veiled in selectively edited Data is no longer acceptable.

• The risks and dangers involved in boxing Are best understood by ringside physicians.

• We know how dangerous boxing is…….. We also know how safe it can be.
CHRONIC BRAIN INJURY IN BOXING

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The end

Or maybe just the beginning of a load more!