

Clinical Generalities of TSE's and CJD

Dr. Paul Brown

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New York Academy of Medicine

Generalities

ANIMALS

HUMANS

**Scrapie
(sheep/goats)**

**Creutzfeldt-
Jakob disease**

**TME
(mink)**

Sporadic

Familial

**CWD
(deer/elk)**

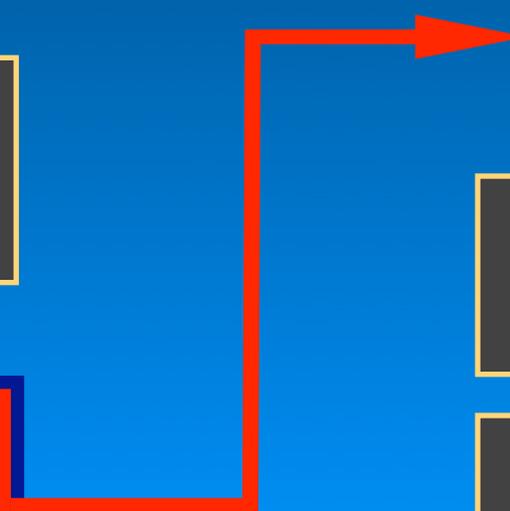
Iatrogenic

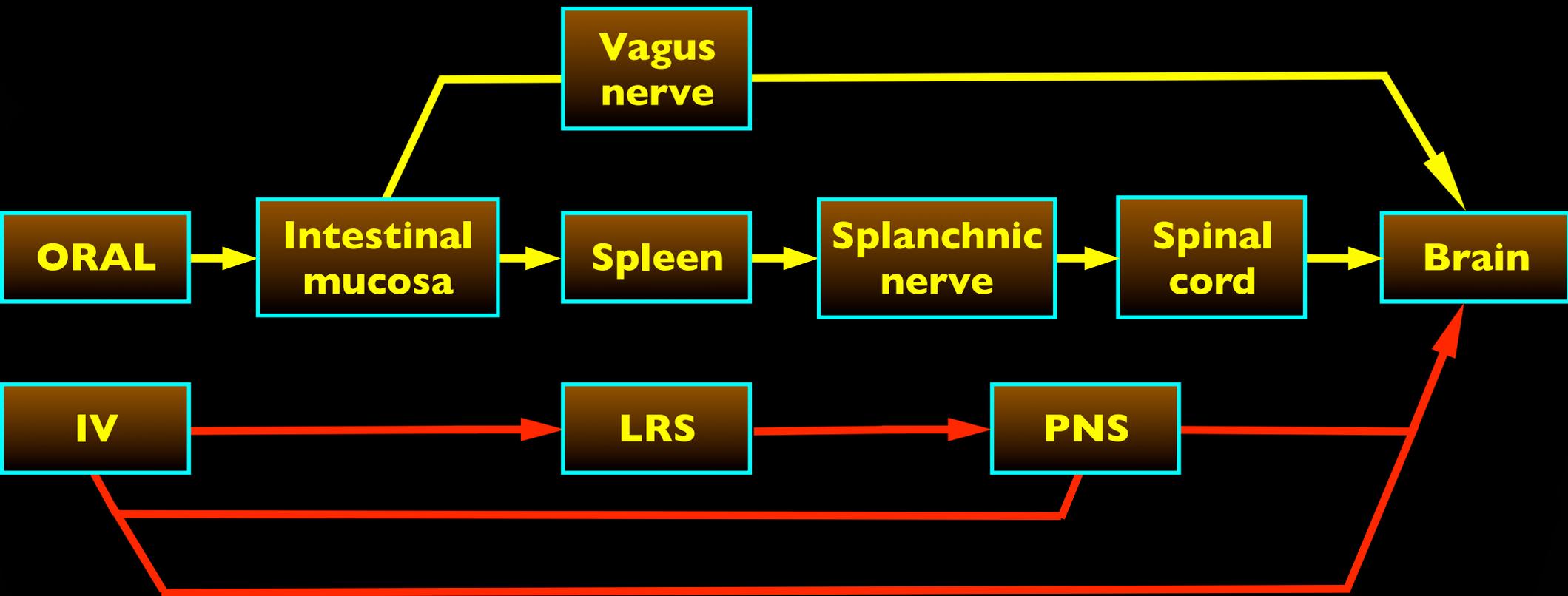
Variant

**BSE
(cattle)**

GSS

FFI

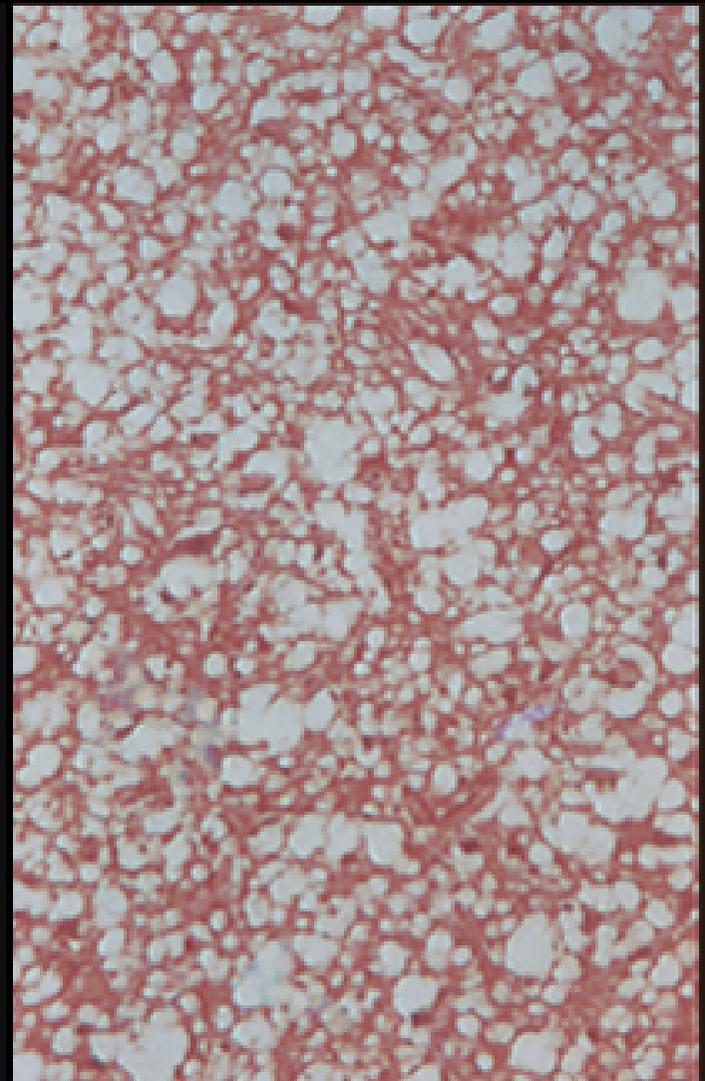
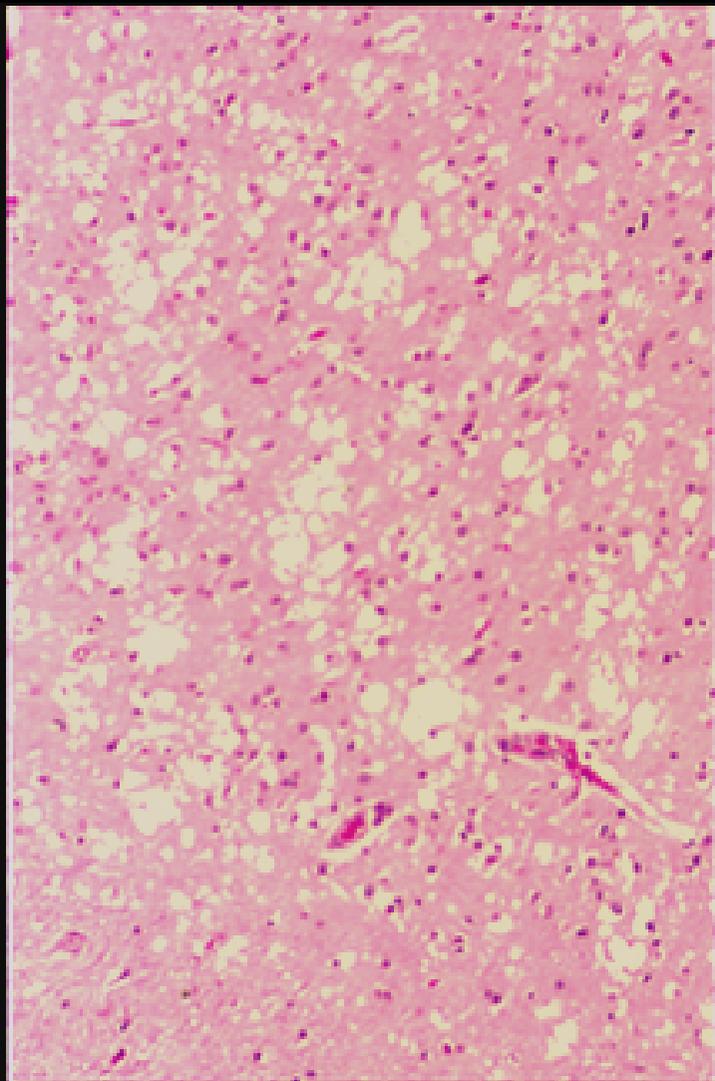
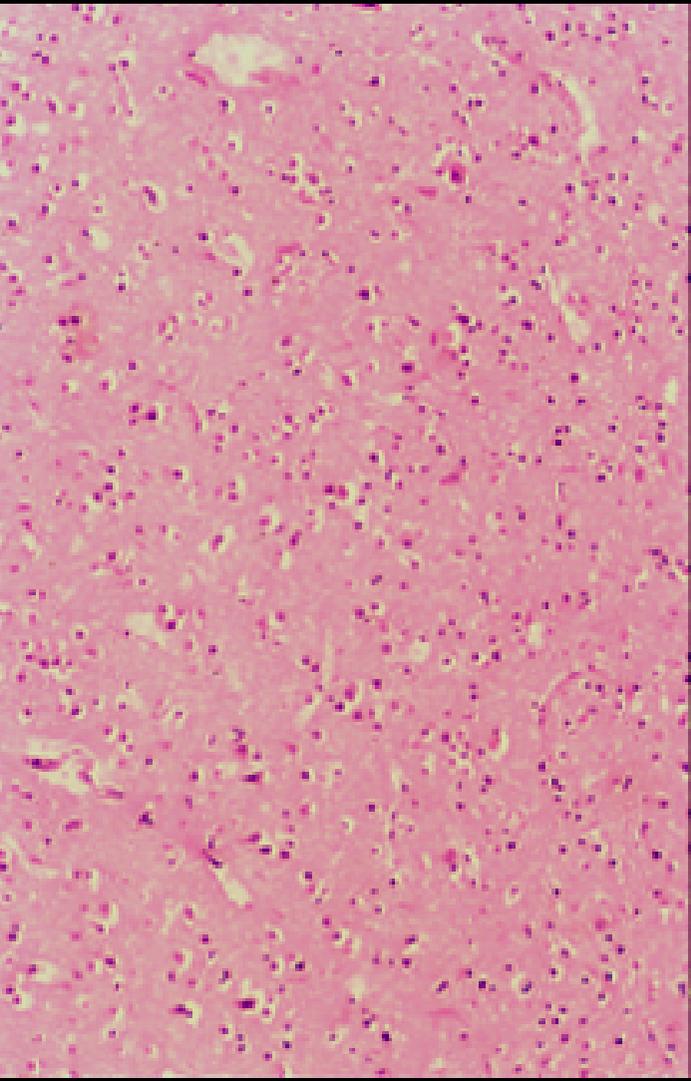




Infectivity distribution in human CJD (primate bioassays)

TEST	INFECTIVITY ¹	TISSUE	INFECTIVITY ¹
Brain	+++	Heart muscle	0
Eye	+++	Skeletal muscle	0
Dura mater	++	Adipose tissue	(0)
Pituitary gland	++	Testis	(0)
Spinal cord	++	Prostate	(0)
CSF	++		
Lung	+	Tears	0
Liver	+	Nasal mucous	0
Kidney	+	Saliva	0
Spleen	+	Sputum	0
Lymph nodes	+	Urine	0
Blood	+ (?)	Feces	0

¹ Presence of infectivity: +++ usual, ++ frequent, + irregular, 0, absent.
Parentheses indicate very few tested specimens



iatrogenic CJD

Surgical procedures

Hormone therapy

Dura mater
graftsSurgical
instrumentsEEG
needlesCorneal
transplantsGrowth
hormoneGonado-
tropin

Argentina

1

Australia

5

1

4

Austria

1

Brazil

1

Canada

4

Croatia

1

France

9

2

100

Germany

4

Holland

2

1

Ireland

1

Italy

4

Japan

113

1

N. Zealand

2

5

Qatar

1

Spain

9

Switzerland

1

2

Thailand

1

U.K.

7

3

46

U.S.

3

1

26

Totals

168

5

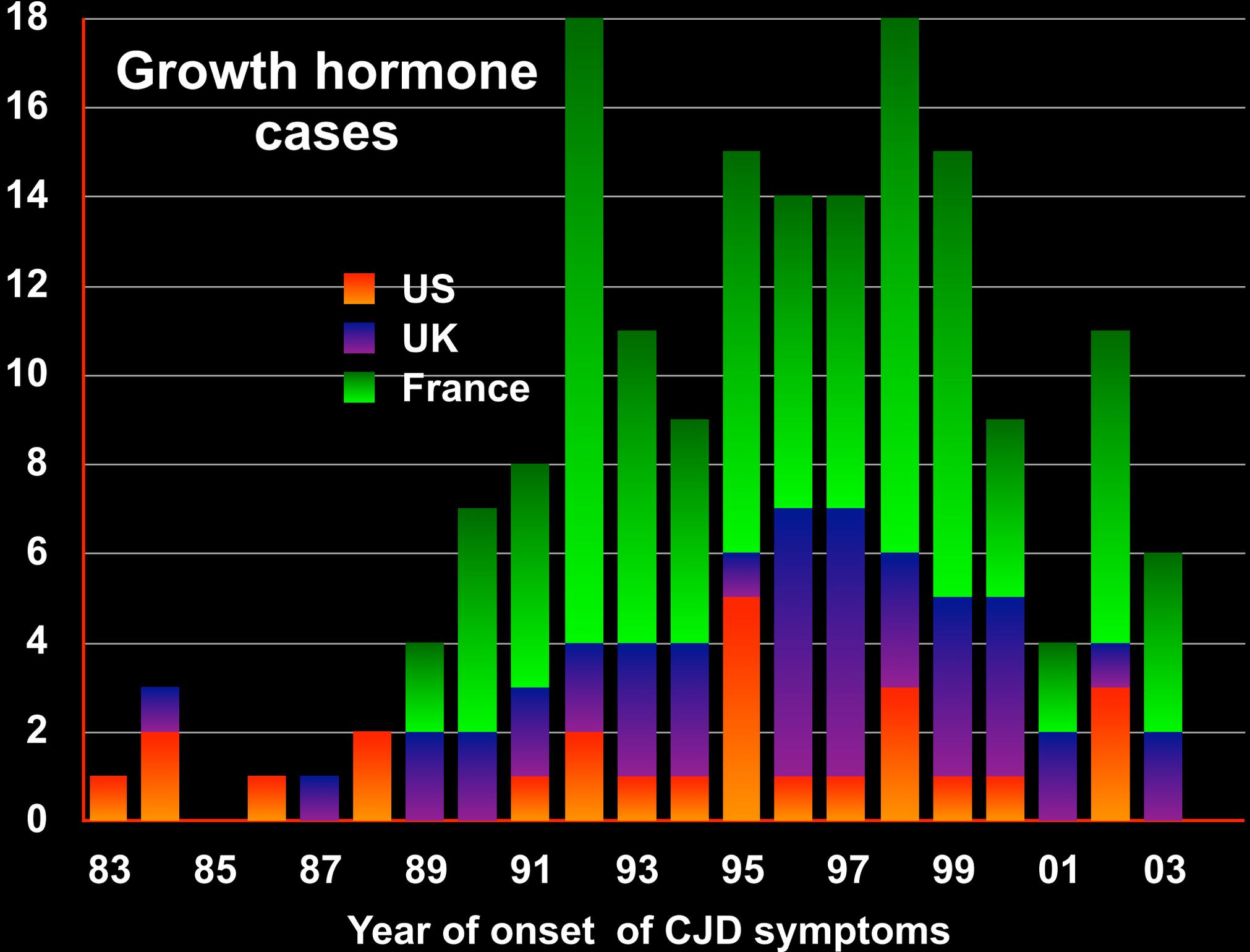
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3

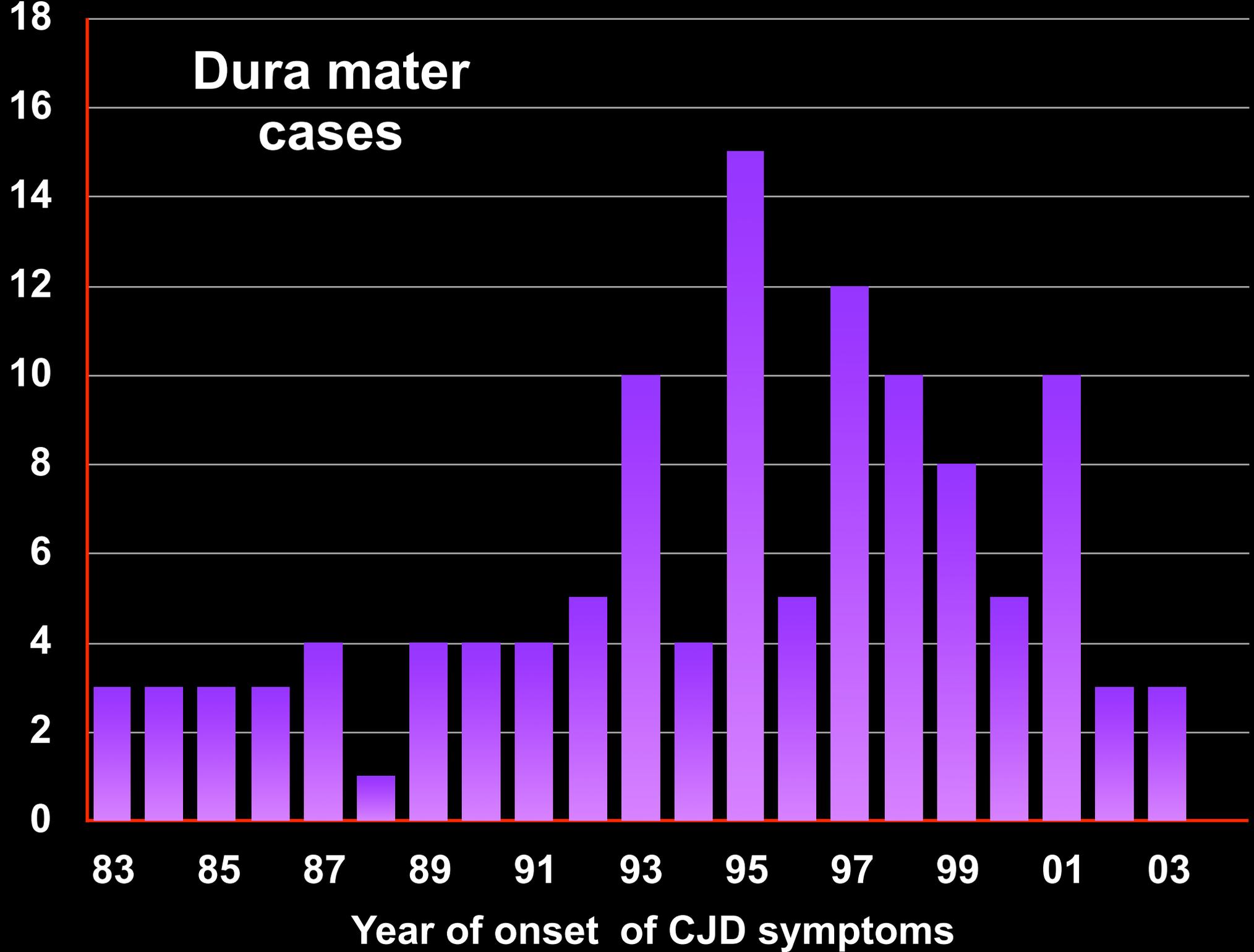
180

4

Growth hormone cases



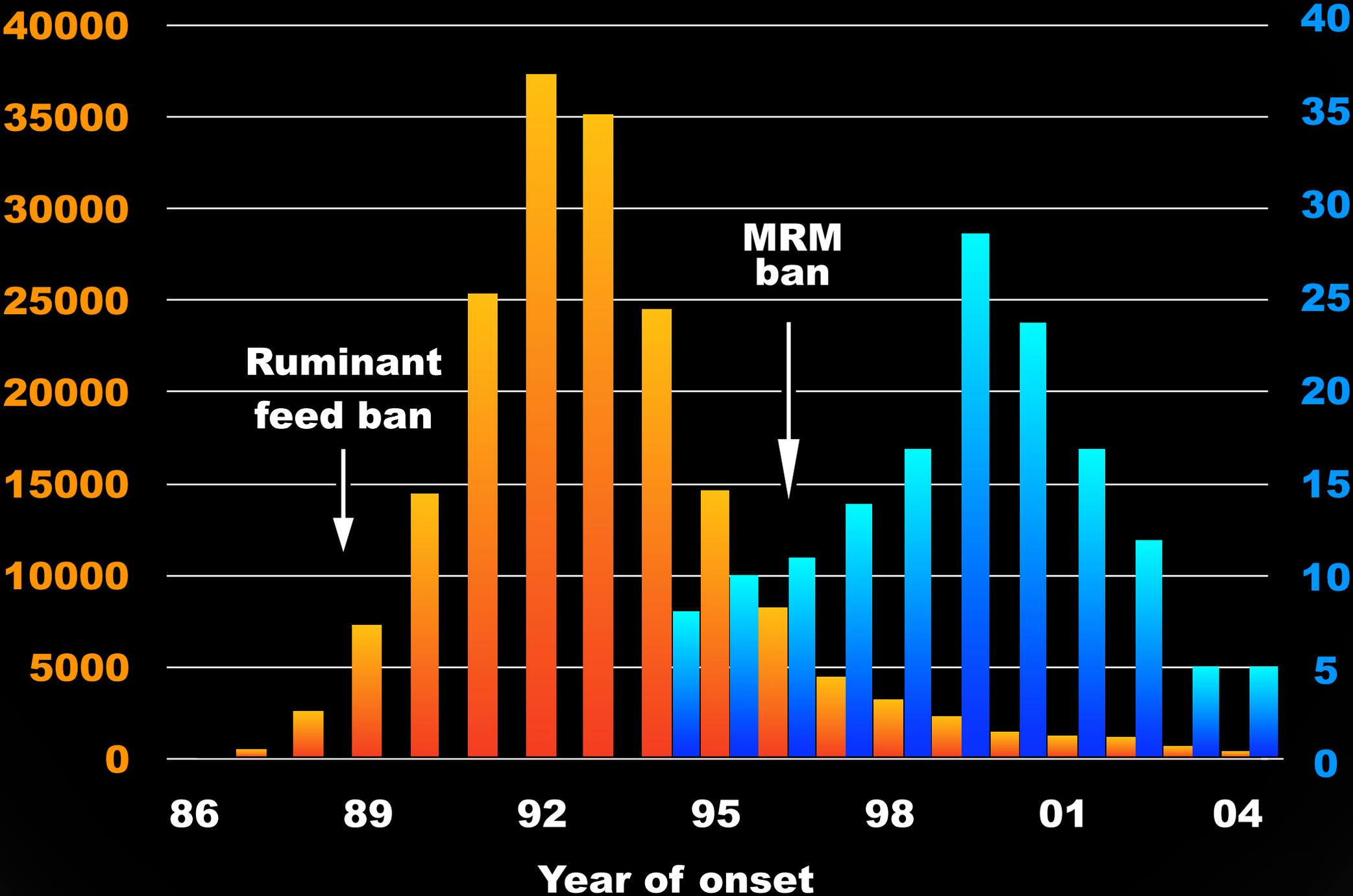
Dura mater cases

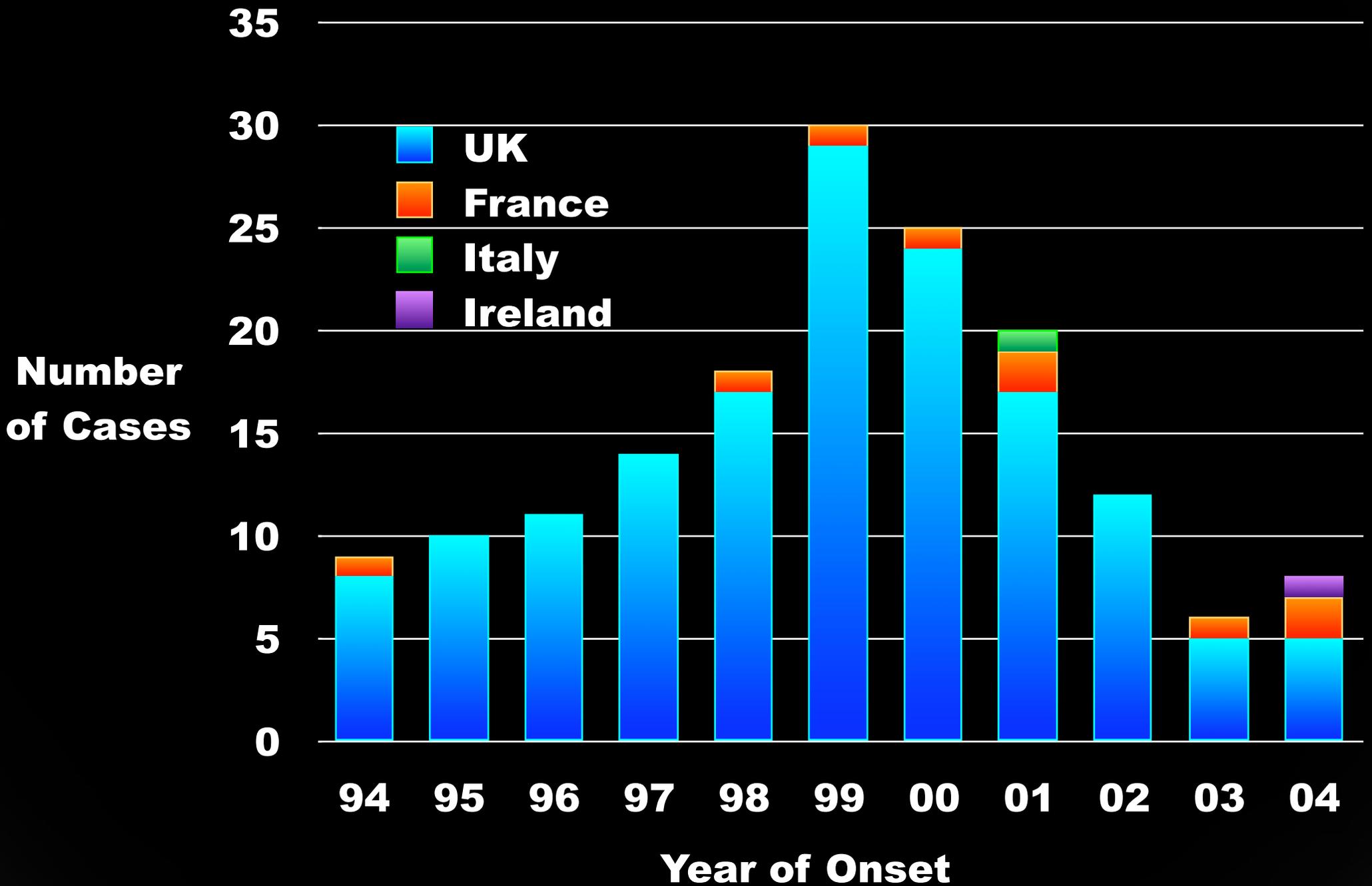


BSE & vCJD

BSE

vCJD





24 year-old donor



3 yrs later (1999): vCJD

Packed RBCs (1996)



62 year-old recipient



7 yrs later (2003): vCJD

27 year-old donor



18 mos later (2001): vCJD

Packed RBCs (1999)



77 year-old recipient



5 yrs later (2004): vCJD

Current concerns

- **Appearance of atypical BSE strains**
- **Possibility of spontaneous occurrence of BSE**
- **Back-crossing of BSE to sheep (goat already +)**
- **Possibility of 'second wave' of orally-acquired vCJD in heterozygous codon 129 humans**
- **Possibility of large number of human 'carriers' who could transmit secondary infections via blood, tissue graft, or surgical contaminations**

Decontamination

Materials

Methods

Disposables

Incineration, burial

Re-usables

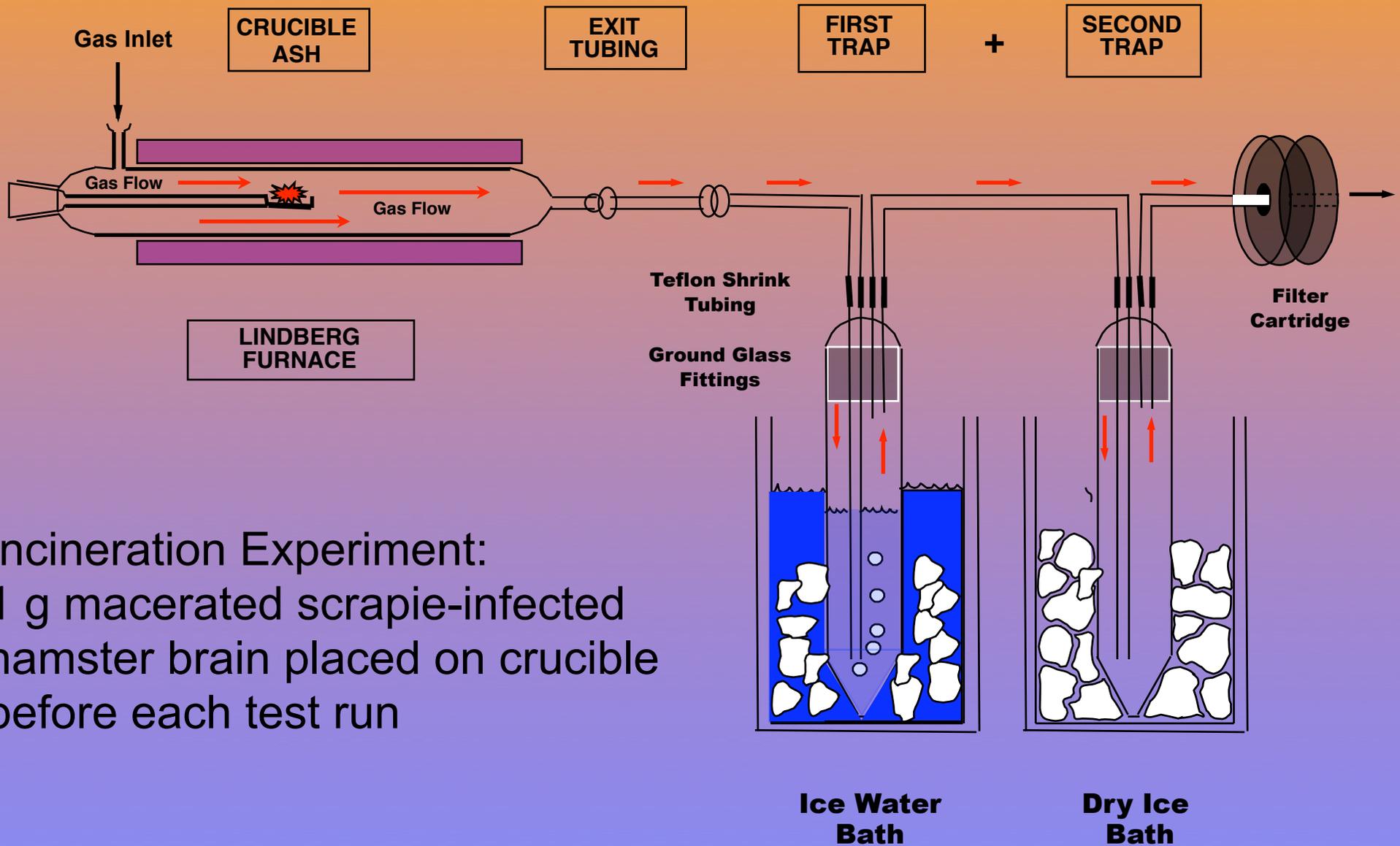
Autoclave, chemicals

Biologicals

**Chemicals (rare),
removal methods**

Consumables

Ultra-high pressure



Incineration Experiment:
 1 g macerated scrapie-infected hamster brain placed on crucible before each test run

Test Conditions			Bioassay Results		
Tissue	°C	Gas	Crucible	Exit tube	Traps
Infected	600	Air	2/21	0/22	0/24
		N ₂	0/20	0/19	0/26
	1000	Air	0/15	0/26	0/23
		N ₂	0/23	0/18	0/23
Normal	600	Air	0/20	nt	nt
		N ₂	0/21	0/18	
	1000	Air	0/23	nt	nt
		N ₂	0/20	0/18	

Physical & chemical Choices

Ineffective

Physical

Boiling

Irradiation

Chemical

Acids

Iodine

Alcohols

Permanganate

Detergents

Peroxide

Ethylene oxide

Phenolics

Formaldehyde

β -propiolactone

Gluteraldehyde

Organic solvents

Partially effective

Physical

Steam heat at 121°C (autoclave)

Dry heat at 300°C (oven)

Pressure (100,000 psi) at 121°C

Chemical

Alkali, 0.1 N (pH 12)

Hypochlorite, 0.5-2.5%

Guanidinium thiocyanate

Keratinase

Urea, 6 M

Effective

Physical

Steam heat at 134°C (autoclave)

Dry heat > 600°C (oven)

Pressure (\geq 150,000 psi) at 134°C

Chemical

Alkali, \geq 1 N (pH \geq 13)

Hypochlorite, \geq 2.5%

Saturated phenol

Formic acid (>90%)

New Methods for delicate Instruments

Chemical treatment	Time and temperature	Log reduction
Peracetic acid (0.25%)	12 min/55°C	3.5
Alkaline cleaner (1.6 %)	15 min/43°C	> 5.6
Phenolic disinfectant (5%)	30 min/20°C	> 5.6
Enzymatic cleaner (0.8%)	5 min/43°C	3.5
Hydrogen Peroxide vapor	3 hr/25°C	4.5
Enz cleaner + HP vapor	Sequence	> 5.6

