

1. A Practical Treatise upon Diseases of the Teeth

A Practical Treatise upon  
Diseases of the Teeth (1778)

- Hunter was able to successfully transplant teeth between individuals
- Unfortunately, many recipients received syphilis as well

(c) 2006, Jeffrey T. Cooper, M.D.

2. Organs from other people

Why can't we accept organs from other people without rejection ?

(c) 2006, Jeffrey T. Cooper, M.D.

3. Self from non-self

## How do we differentiate self from non-self ?

(c) 2006, Jeffrey T. Cooper, M.D.

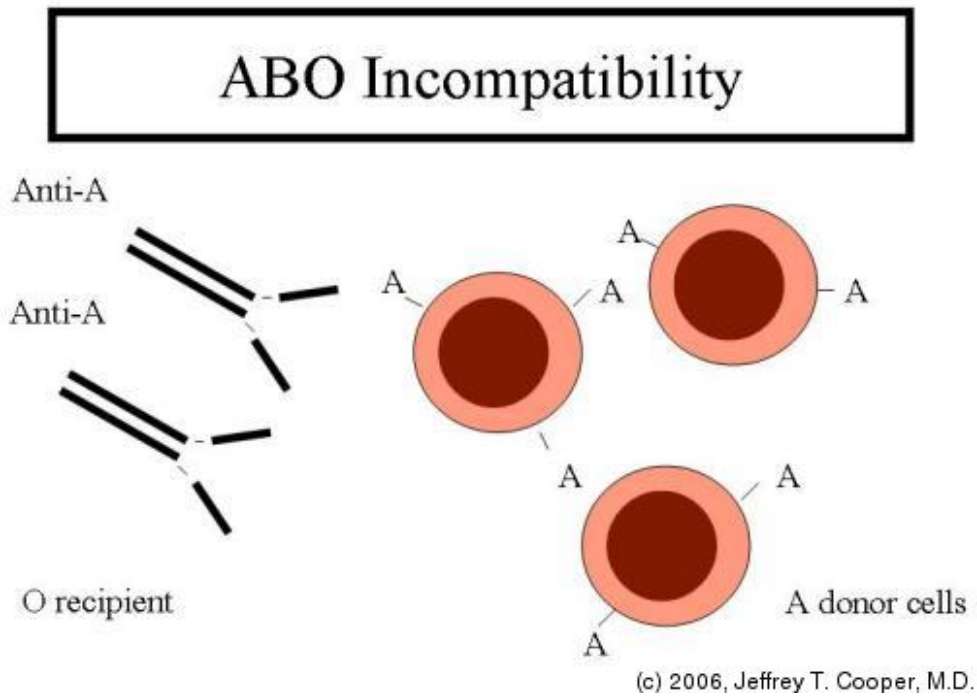
4. Humoral or Antibody Defense

## Humoral or Antibody Defense

(c) 2006, Jeffrey T. Cooper, M.D.

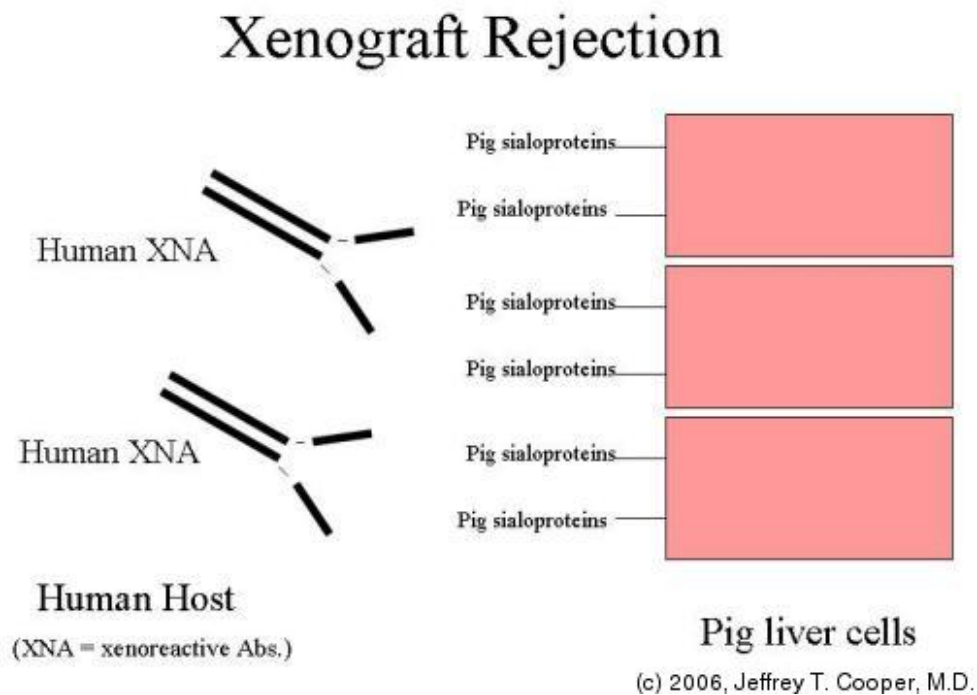
5.

### ABO Incompatibility



6.

### Xenograft Rejection

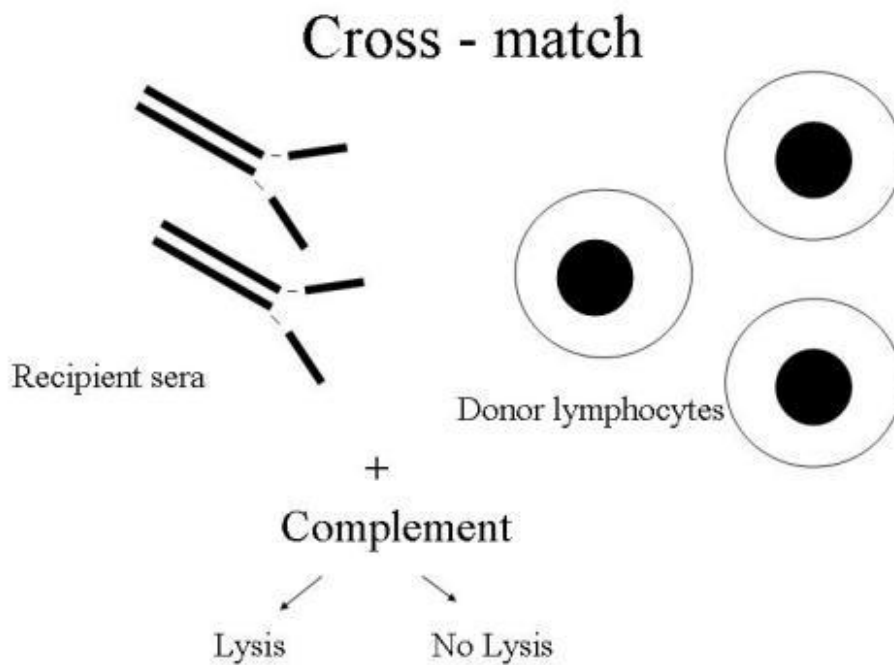


7. Pre-formed anti-bodies

How do we make sure there are  
no pre-formed anti-bodies ?

(c) 2006, Jeffrey T. Cooper, M.D.

8. Cross - match



(c) 2006, Jeffrey T. Cooper, M.D.

9. Humoral-mediated Rejection

## Humoral-mediated Rejection

- If pre-existing Ab's exist → Hyperacute rejection
  - the graft is lost in minutes
- If pre-existing sensitized B cells exist → De-novo Ab creation
  - acute vascular rejection
  - occurs over 24-72 hours

(c) 2006, Jeffrey T. Cooper, M.D.

10. Cell-mediated Defenses

## Cell-mediated Defenses

(c) 2006, Jeffrey T. Cooper, M.D.

11. Which cells?

## Which cells?

- T-cells
- Antigen presenting cells
- Natural killer cells
- Monocytes

(c) 2006, Jeffrey T. Cooper, M.D.

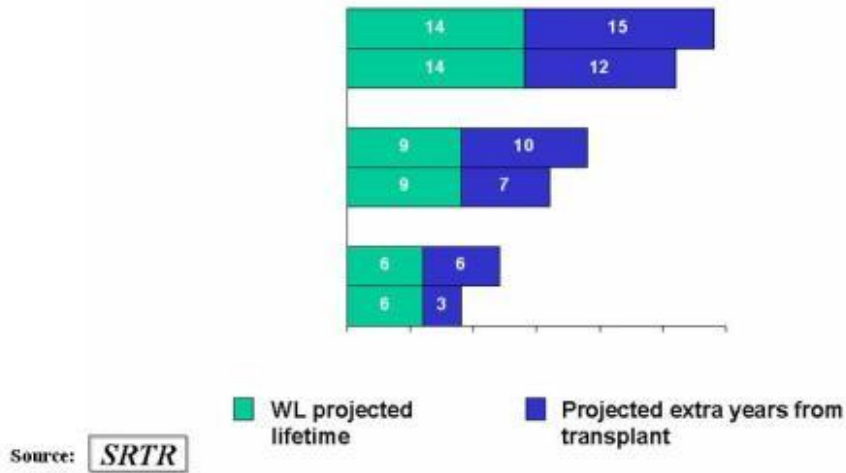
12. Why do kidney transplants?

## Why do kidney transplants ?

(c) 2006, Jeffrey T. Cooper, M.D.

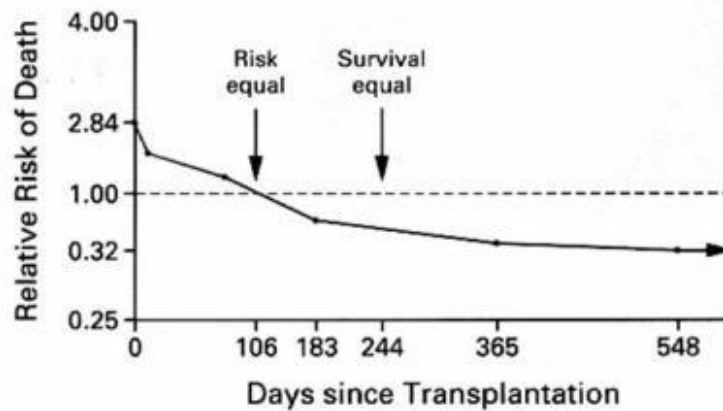
13. Liver and Kidney Transplantation: Slide 13

Projected lifetime on waitlist and extra lifetime after Cadaveric kidney transplant by age, 1995 - 2001



(c) 2006, Jeffrey T. Cooper, M.D.

14. Liver and Kidney Transplantation: Slide 14



Wolfe, et al. NEJM, 1999

(c) 2006, Jeffrey T. Cooper, M.D.

15. Costs

## Costs

- The annual cost of hemodialysis is \$50,000
- The cost of a renal transplant is \$100,00 for the first year
- After the first year, transplant cost is about \$10,000
- Mean cumulative cost is equivalent at 4 years

(c) 2006, Jeffrey T. Cooper, M.D.

16. Quality of Life

## Quality of Life

- Studies show improved quality of life over HD
- Improvement of uremia
  - anemia
  - peripheral neuropathy
  - autonomic neuropathy
  - sexual dysfunction

(c) 2006, Jeffrey T. Cooper, M.D.

17. Liver and Kidney Transplantation: Slide 17

- Reported Deaths and Annual Death Rates Per 1,000 Patient Years at Risk, 1991 to 2000

**Kidney Waiting List:**

Year	1993	1994	1995	1996	1997	1998	1999	2000
<b>Total Patients</b>	35,177	38,282	41,888	45,479	49,409	53,593	57,379	61,084
<b>Deaths</b>	1,337	1,400	1,545	1,855	2,053	2,427	3,197	2,806
<b>Rate</b>	56.9	54.3	53.7	57.5	57.7	62.4	75.7	61.4

www.unos.org

(c) 2006, Jeffrey T. Cooper, M.D.

18. Time to Transplant for Waitlist Patients

Time to Transplant for Waitlist Patients<sup>†\*\*</sup>  
Patients registered on the waitlist between 01/01/1996 and 06/30/2001

<b>Months to Transplant *</b>	
Percentile	U.S.
5 <sup>th</sup>	1.7
10 <sup>th</sup>	3.4
25 <sup>th</sup>	9.9
50 <sup>th</sup> (median to transplant)	34.5

Source: National Report- www.unos.org Organ: Kidney

(c) 2006, Jeffrey T. Cooper, M.D.

19. Presented

**“Presented” -**

put on surface of PAC where they await a T cells with receptor that recognizes a complex of that MHC molecule holding that specific peptide

(c) 2006, Jeffrey T. Cooper, M.D.

20. Liver and Kidney Transplantation: Slide 20

To prevent a pathogen from circumventing this system for T cell activation

There exist two **independent** ways of turning on T cells:

- **Exogenous Ag:** (i.e. grass pollen)  
CD4 T cell – Ag peptide – MHC class II (HLA-D)
- **Endogenous Ag:** (i.e. influenza virus)  
CD8 T cell – Ag peptide – MHC class I (HLA-A, B, C)

(c) 2006, Jeffrey T. Cooper, M.D.

21. Live donor vs. a cadaveric donor

Does it matter if it is a live donor  
vs. a cadaveric donor ?

(c) 2006, Jeffrey T. Cooper, M.D.

22. Does it matter if you reject?

Does it matter if you reject ?

(c) 2006, Jeffrey T. Cooper, M.D.

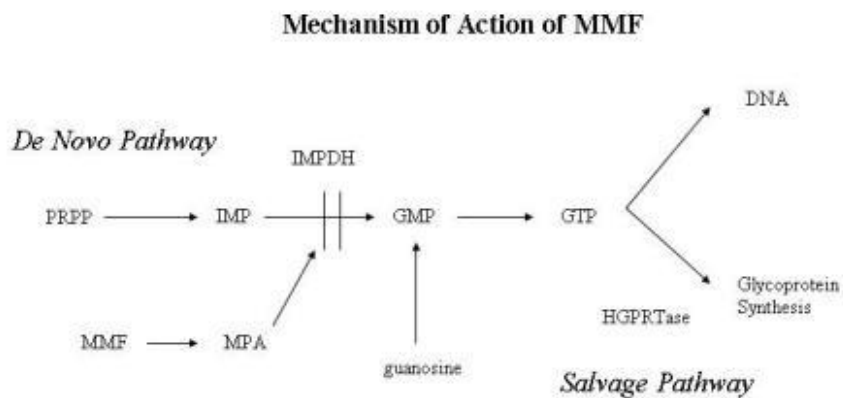
23. Cellular rejection is a T-cell mediated event

## Cellular rejection is a T-cell mediated event

- Induction agents
  - OKT3 (anti-CD3)
  - Thymoglobulin
  - simulect(anti-CD25 --→ IL-2 receptor)

(c) 2006, Jeffrey T. Cooper, M.D.

24. Liver and Kidney Transplantation: Slide 24



(c) 2006, Jeffrey T. Cooper, M.D.

25. Liver and Kidney Transplantation: Slide 25



(c) 2006, Jeffrey T. Cooper, M.D.

26. Liver and Kidney Transplantation: Slide 26

Organ Type	2000	2001	2002
Kidney	3001	3119	3171
Pancreas	15	40	27
Kidney-Pancreas*	190	221	201
Liver	1784	2012	1756
Intestine*	23	46	52
Heart	617	637	552
Lung	452	491	468
Heart-Lung	43	40	37
Total*	8054	8455	8077

\* Total Unique Patient Deaths

(c) 2006, Jeffrey T. Cooper, M.D.

27. Liver and Kidney Transplantation: Slide 27



(c) 2006, Jeffrey T. Cooper, M.D.

28. Liver and Kidney Transplantation: Slide 28



(c) 2006, Jeffrey T. Cooper, M.D.