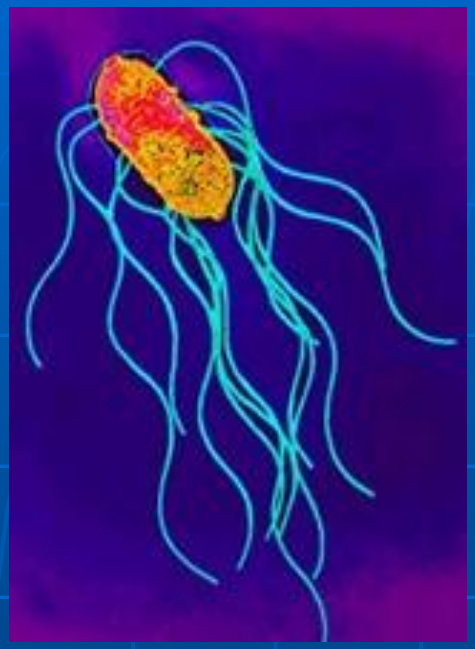

INFECTIOUS PROCESS

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Content

- Infectious diseases. Infectious process
- Biological basis of infectious process

- Syndromes of infectious diseases.
- Diagnosis (etiology)
  - Microscopy,
  - Bacteriological investigation ,
  - Serological investigations
  - Primary and secondary immune response
- To prove etiological diagnosis: Ab; Ig; Ag

- Phases of the process
- Treatment
  - Etiotropic treatment
  - Pathogenetic (syndromic) treatment
  - Basic regiment

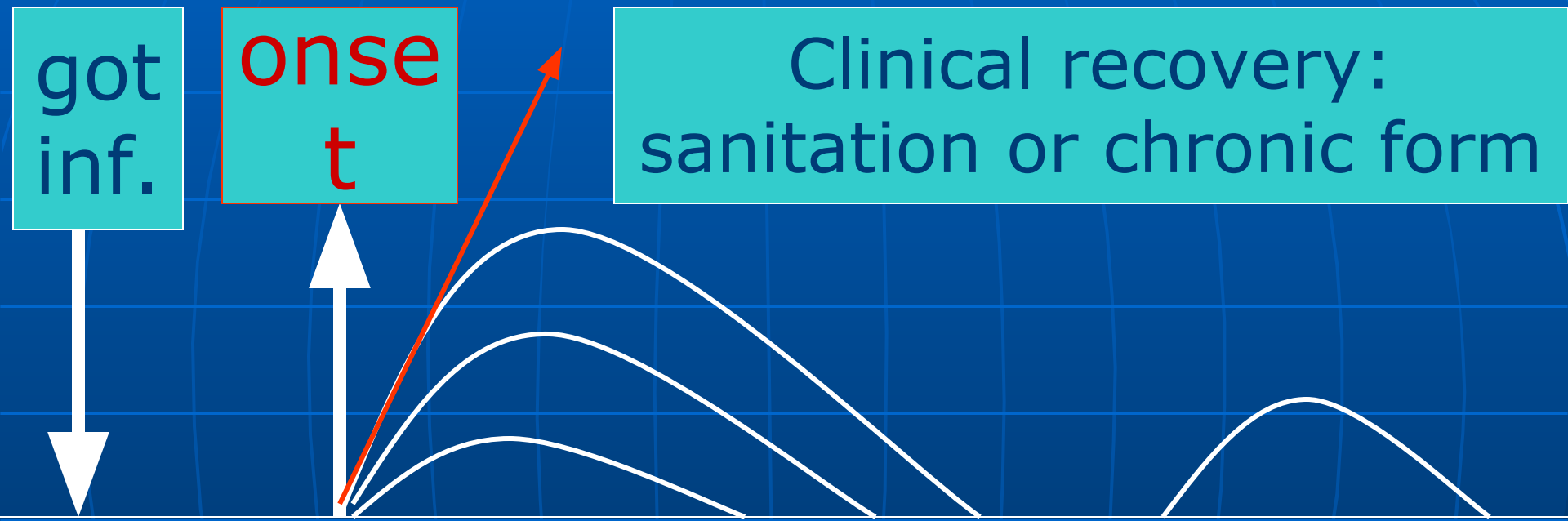
Infectious PROCESS is
an interaction between
micro- and macro-organisms
(under the impact of natural and
social factors of the environment).

Infectious DISEASE is
a clinically marked part of this
process.

Infectious diseases

- **There is an agent** =>
- Contagious: can be transmitted to another macro-organism => possibility of an outbreak.
- Cyclic course (timing).

Infectious process.



Biological basis of infectious process

Agent's factors:

pathogenic power; portal of entry of infection; dose

Host's factors:

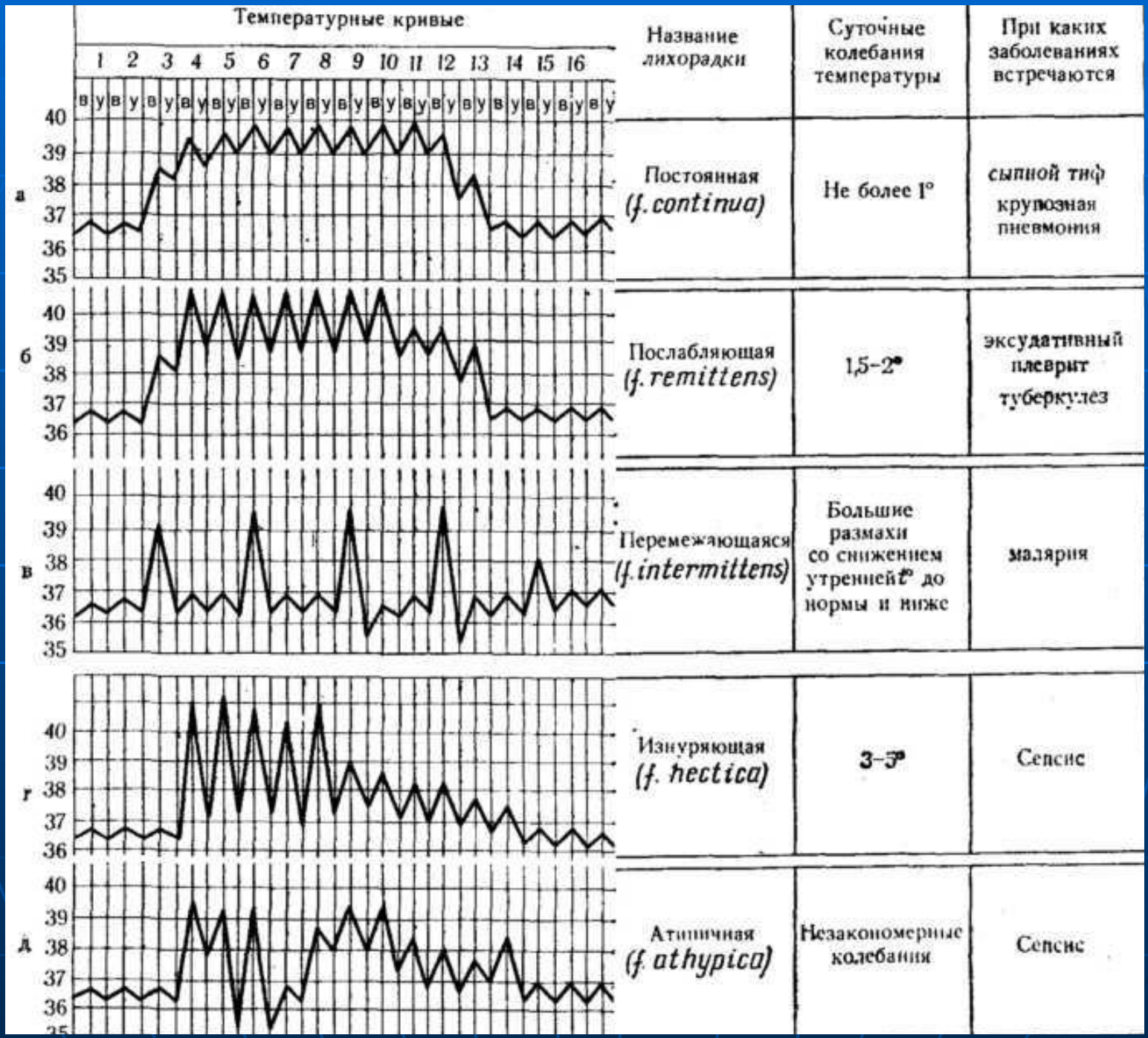
- genetically determined: non-specific and specific resistance (HLA)
- acquired: nutrition, intoxications, ecologic factors, behavior patterns, vaccination, treatment.

Complications

- Specific: typical to the disease (perforation of ulcers of small intestine in typhoid fever patients)
- Non specific (sepsis of another origin due to prolonged presence of intravenous catheter).

Symptoms and signs of infectious diseases

- Fever
- Rash
- Lymphadenopathy
- Liver /spleen enlargement
- Respiratory syndrome
- Diarrhea
- Hepatitis
- Meningeal syndrome,
- etc



Название лихорадки	Суточные колебания температуры	При каких заболеваниях встречаются
Постоянная (*f. continua*)	Не более 1°	*сыпной тиф* крупозная пневмония
Послабляющая (*f. remittens*)	1,5–2°	эксудативный плеврит туберкулез
Перемежающаяся (*f. intermittens*)	Большие размахи со снижением утренней t° до нормы и ниже	малярия
Изнуряющая (*f. hectica*)	3–5°	Сепсис
Атипичная (*f. athypica*)	Незакономерные колебания	Сепсис

Syndromes

- Congunctivitis,
- Tonsillitis, pharyngitis, stomatitis, …
- Pneumonia, bronchitis…
- Gastro-entero-colitis…
- Hepatitis…
- Kidney insufficiency (acute, chronic)
- Meningitis…
- DIC,
- etc

Diagnosis

- Anamnesis, symptoms and signs => syndromes.

  Prove the syndrome: biochemical tests, ECG, X-ray, USI, etc.

- Anamnesis, association of syndromes => suggestion of etiology.
- Clinical etiologic diagnosis is always hypothetical => how to check it?

Etiologic diagnosis

- To prove or to disapprove it: to find the supposed agent or to find its markers.
- Markers: Ag of the agent or Ab to it.

- Methods depend on the agent:

bacteria, virus, rickettsia, clamydia, mycoplasma, protozoa, helminthes, fungi.

Microscopy

Pluses:

- fast
- **the main method for protozoa, helminthes, fungi.**

Minuses: for bacterial infections in the most cases it is a tentative method.

But sometimes can be very informative (N.meningitidis in CSF).

Bacteriological investigation

Pluses: accurate; sensitivity to antibiotics

Minus: needs time (several days or more)

Negative result does not always turn down a supposed diagnose:

- defects of sample taking, transportation, media and lab technique;
- recovery stage (spontaneous or due to correct treatment).

Absence of correct suggestion! => media

Serological investigations

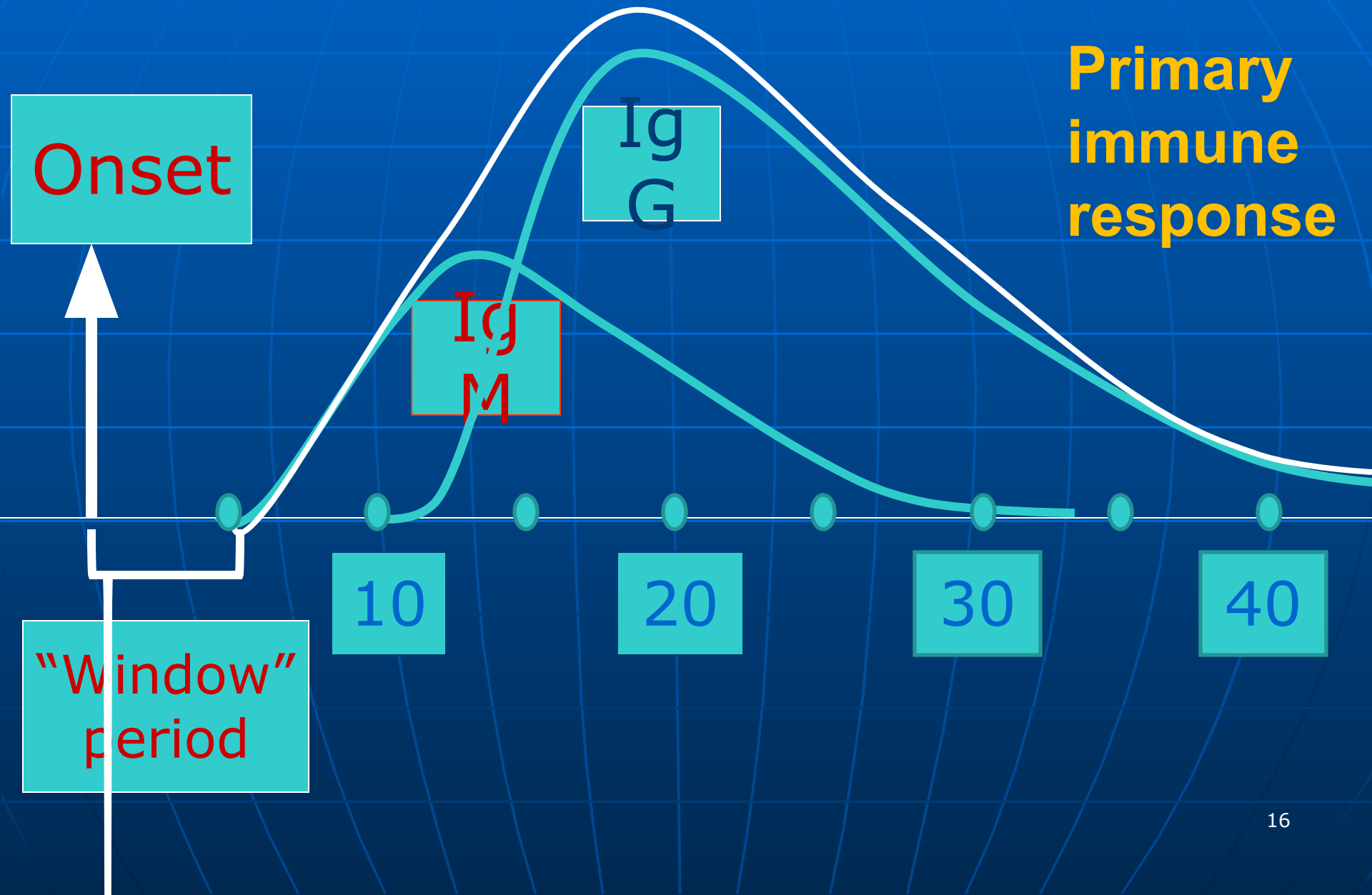
- To detect antibodies to a suggested agent
- Antibodies – in serum (CSF).

Pluses: simple; reliable; cheap; often – the only confirmation of a diagnosis.

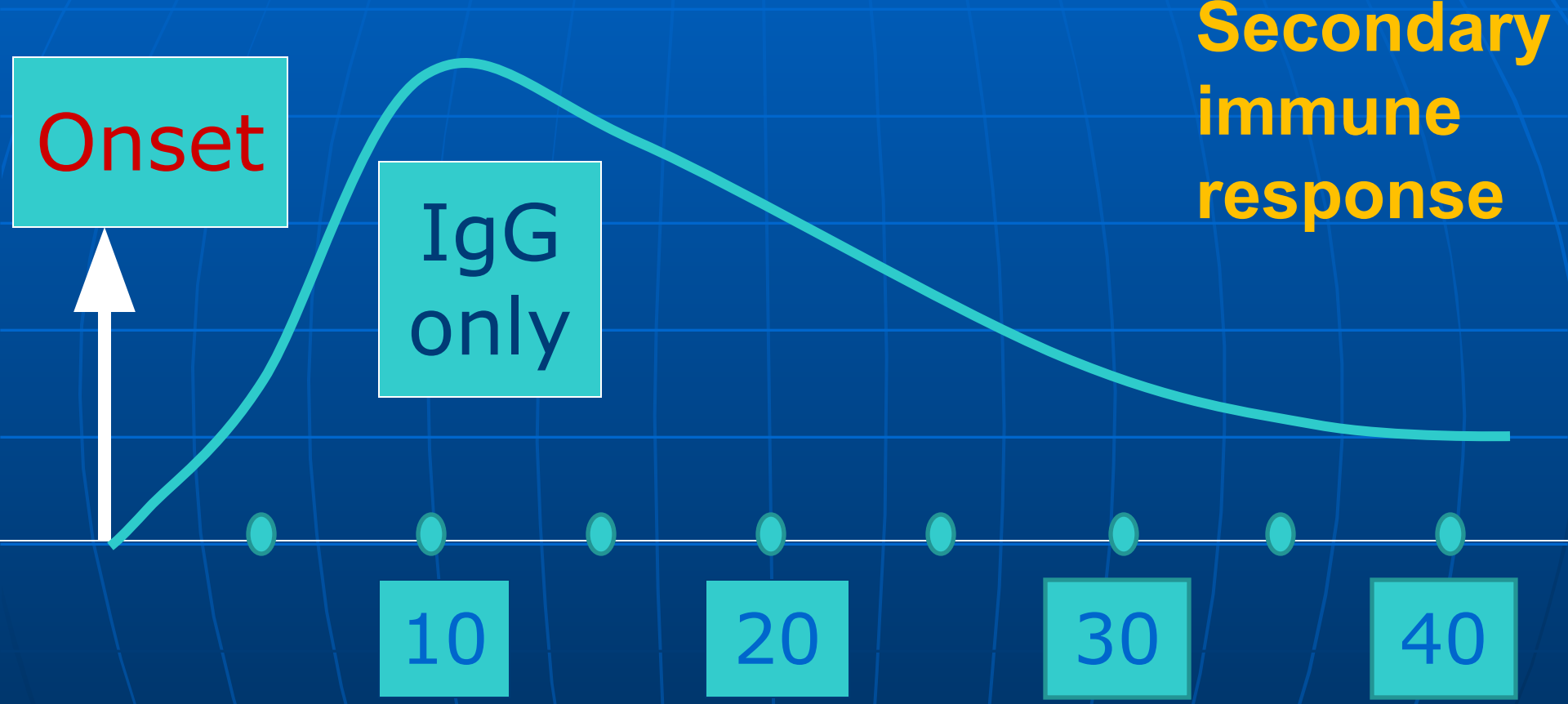
Minuses:

- "window period";
- investigation itself is fast, but results are always retrospective.

Antibodies


Onset
Ig G
Ig M
Primary immune response
10
20
30
40
"Window" period

Antibodies



No “window” period; no IgM

To prove etiological diagnosis: Ab

- 4 times **increase** in titers of Ab to the agent (primary or secondary immune response):
- **Samples should be taken twice in time!**

- 1-st time: the 1-st week (zero is expected),
- 2-nd time: in 2 weeks (maximum level).

- Diagnosis is late: after 2-3 weeks; can be even later under effective treatment =>

- the 3d sample at week 5-6 of the disease.

- The only test can be (+) due to previous disease, vaccination, poly-agglutination. "Min diagnostic level of Ab" is not reliable.

To prove etiological diagnosis: Ig

- **Ig M (+)** to the agent even once means the primary immune response.
- Ig M can be usually found since the 5-th day of the disease up to the 4-6 weeks.
- Rare IgM can persist much longer (HBV).
- **Ig G(+)**: >10 days of the disease (peak, recovery, chronic stage, previous disease or vaccination)–similar to Ab significance.

To prove etiological diagnosis: Ag

- Ag can be found in any substrate.
- No “window” period =>
- Express-techniques to reveal the Ag (Ab with some additional mark to make immune complex visible): plague, etc.
- PCR – to reveal DNA/RNA of the agent. In blood PCR(+): replication; PCR(-): no replication; sanitation -? => biopsy.
- Ag disappear in the process of sanitation in recovery stage => Ab.

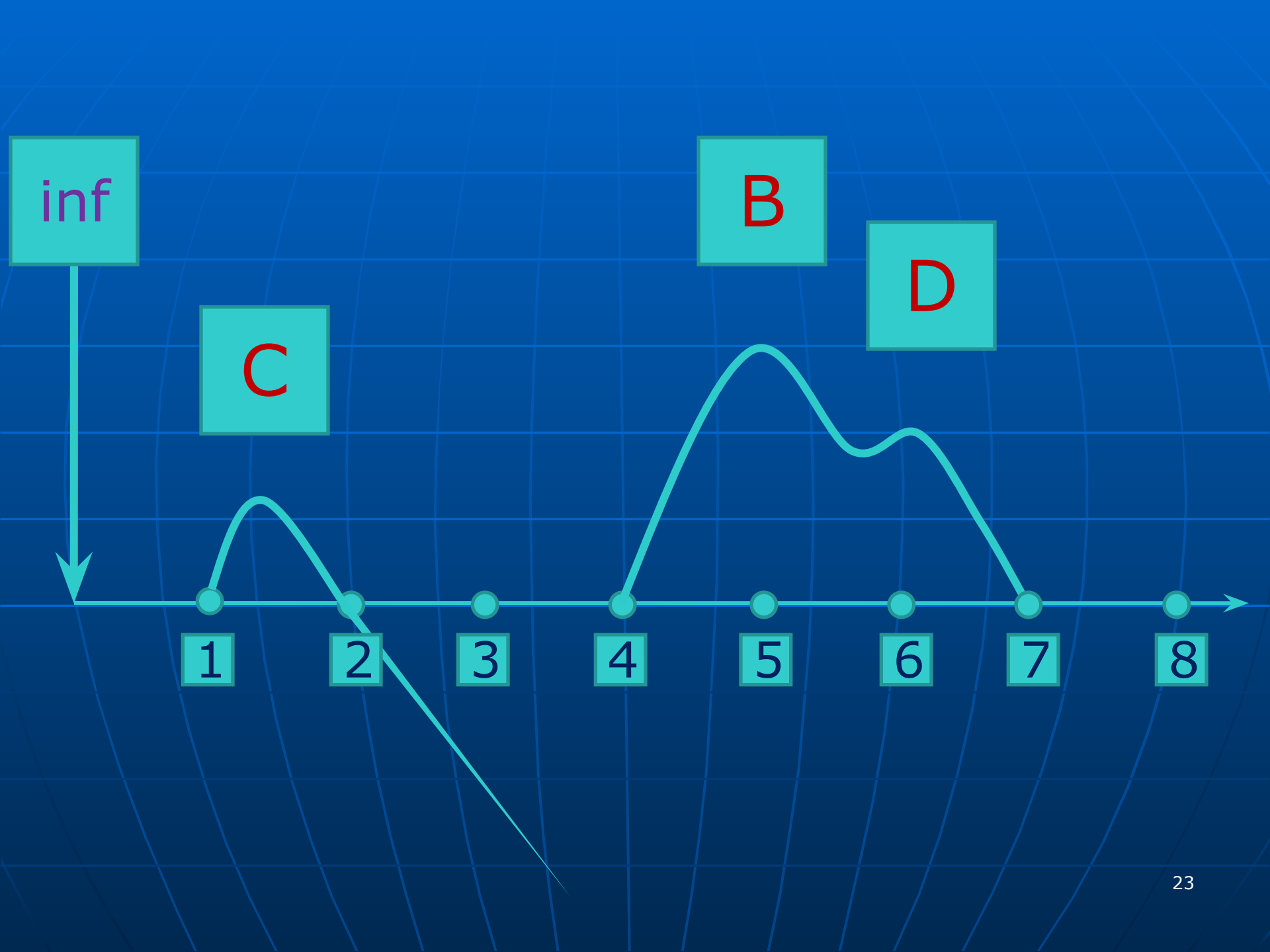
Phases of the process

- The end of incubation and the first part of the disease – presence of Ag; no Ab: the most contagious and dangerous part.
- Recovery with clearing from the agent: all Ag disappear, Ab become (+).
- Chronic form: presence of Ag, or Ag+Ab; sometimes – only Ab (anti-HBcor Ab).

- Life prognosis depends mostly on tissues functions (biochemical tests, ECG, etc).

Mixed infections, combination of different diseases

- Confirmation of the one disease does not allow us to exclude another one.
- To exclude (or confirm) a disease we should investigate for this disease.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Exact diagnosis:

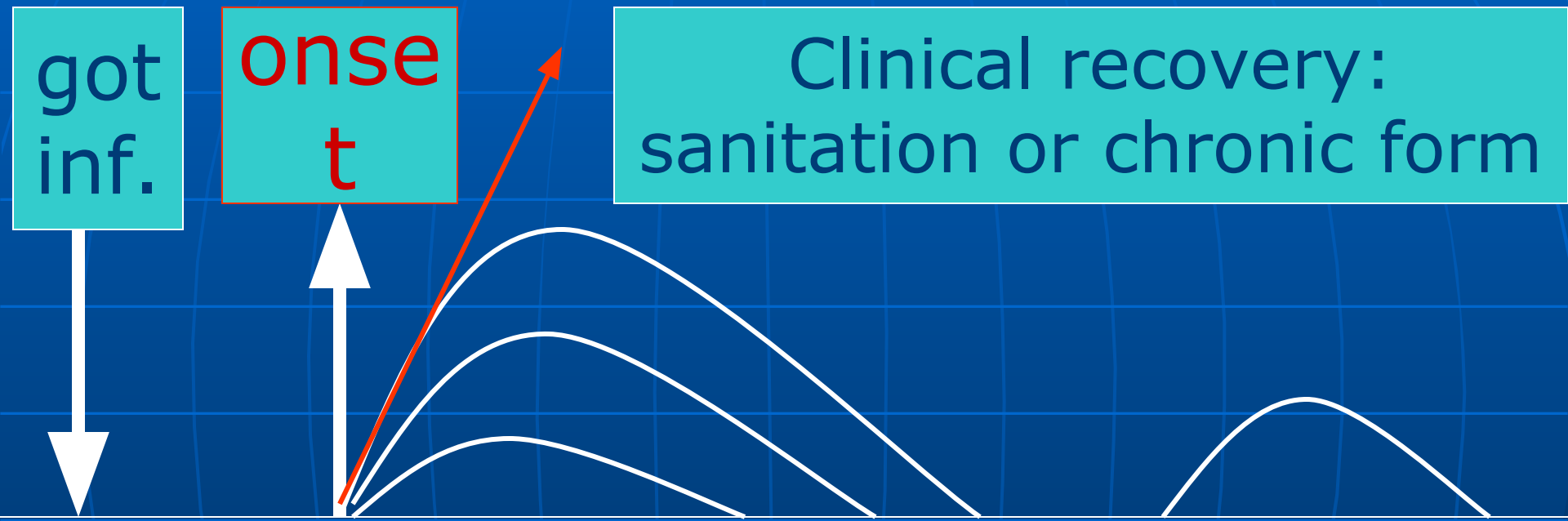
Prognosis

- spontaneous course (subclinical, mild, moderate, severe),
- under the treatment

Treatment

- etiology,
- phase of the process,
- severity

Infectious process.



Treatment

- Etiotropic – to affect the agent.
- Pathogenetic (syndromic)– to improve or to replace tissues functions.
- Symptomatic – to suppress symptoms.

Etiotropic treatment

- Antibacterial, antiviral, antiprotozoal, etc.

- Result of therapy depends mostly on

- **correct choice of spectrum** and activity of preparations (if not correct: disease and treatment go own ways);
- **when the treatment is started** (the first 1-2 days => just stop the disease);
- **duration of the treatment.**

Pathogenetic (syndromic) treatment

- Can be life-saving (rehydration in cholera, hemodialysis in HFRS, dehydration in brain edema, intubation in laryngeal diphtheria).
- Often it is the main part of the treatment: DS is too late to start etiotropic treatment (HAV, HF), or etiotropic treatment is not correct, etc.

Basic regiment

- Bed rest
- Diet: in acute diseases – according to appetite; boiled and cultured milk foods can be used in any situation. Liquids.
- Clinical observation (behavior, t, pulse, BP, RR, diuresis, symptoms and signs).
- Symptomatic treatment - can be useful.