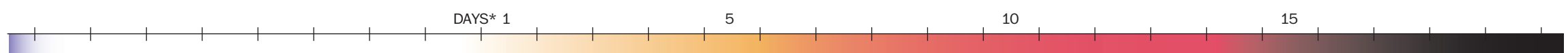


Ebola's catastrophic effect on the body

The virus can lurk in the body for more than a week before it begins a cascading meltdown of the immune system, blood vessels and vital organs.

DESCENT INTO HEMORRHAGIC FEVER



EXPOSURE

Virus enters the body.

INCUBATION

Lasts two to 21 days, but most often four to 10 days before symptoms suddenly appear.

EARLY SYMPTOMS

Usually, a little over a week after exposure to the Ebola virus, people begin having symptoms: fever, chills, muscle pain, sore throat, weakness and general discomfort. In its early stages, Ebola can resemble malaria, typhoid fever or bacterial respiratory infections.

ADVANCED SYMPTOMS

After five or more days, patients often develop signature signs of an Ebola infection:

- Bumpy red rash on the face, neck, torso and arms; skin can flake off
- Severe diarrhea, nausea and vomiting
- Chest pain, shortness of breath, headache, confusion, bloodshot eyes, hiccups or seizures
- Spontaneous bruises, skin hemorrhages
- Bleeding from the eyes, ears, nose, mouth, mucus membranes and rectum
- Spontaneous miscarriage

DEATH

Patients who die from the disease usually develop severe symptoms early on and die between days six and 16. The death rate can be as high as 90 percent.

SURVIVAL

In non-fatal cases, patients might have a fever for several days and improve, usually between days six and 11, but full recovery can be a long process involving inflamed nerves, recurrent hepatitis, bloodshot eyes and psychosis. Those who survive tend to have an early, strong and temporary inflammation response. Many survivors seem to have red blood cells that are able to release proteins that can fix damaged blood vessels.

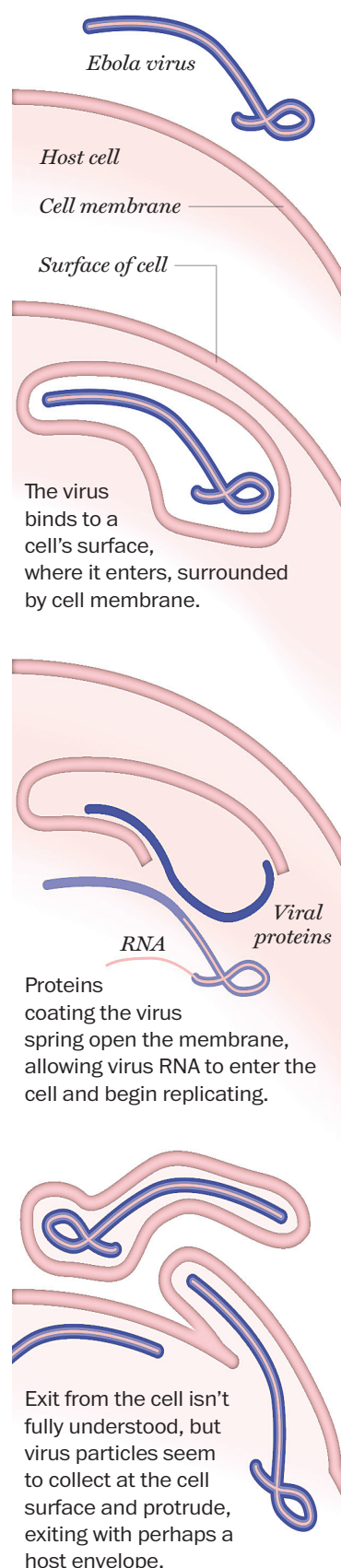
1 Finding a way in

Ebola virus particles occupy an infected person's blood and other bodily fluids, which can enter another person through the **eyes, mucus membranes, scratches** on the skin or from a **hypo-dermic needle** — but not from the air or from insects. The bodies of people who have died of Ebola are highly infectious.

Without protective equipment, shaking hands with an Ebola patient or being within three feet of a patient for long periods of time is less risky, but not advisable.

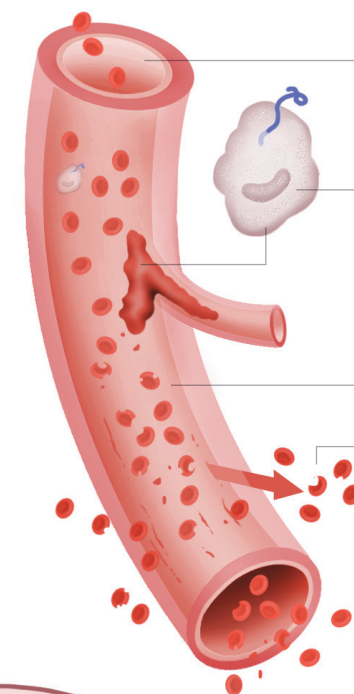
Cell-invasion strategy

Ebola is a filovirus, a tiny filament of proteins covering a single strand of genetic material, RNA, which carries only seven genes that code for viral reproduction and defense against the host's immune system.



2 Initial attack

- The virus attacks **immune cells** in the bloodstream, which carry the infection to the **liver, spleen** and **lymph nodes**. Ebola blocks the release of interferon, a protein made by immune cells for fighting viruses.
- Infected immune cells migrate out of the spleen and lymph nodes, through the bloodstream or lymph ducts to other tissues and organs.



3 Bloodstream trouble

Proteins released by immune cells create widespread **inflammation**, which can damage the tissue lining blood vessels, causing them to leak.

Macrophages, a type of immune cell that Ebola infects, release proteins that cause **clots in the bloodstream**, blocking blood flow to organs such as the liver and kidneys.

Red blood cells break apart when moving through small vessels filled with clots. The spleen becomes overwhelmed with broken blood vessels.

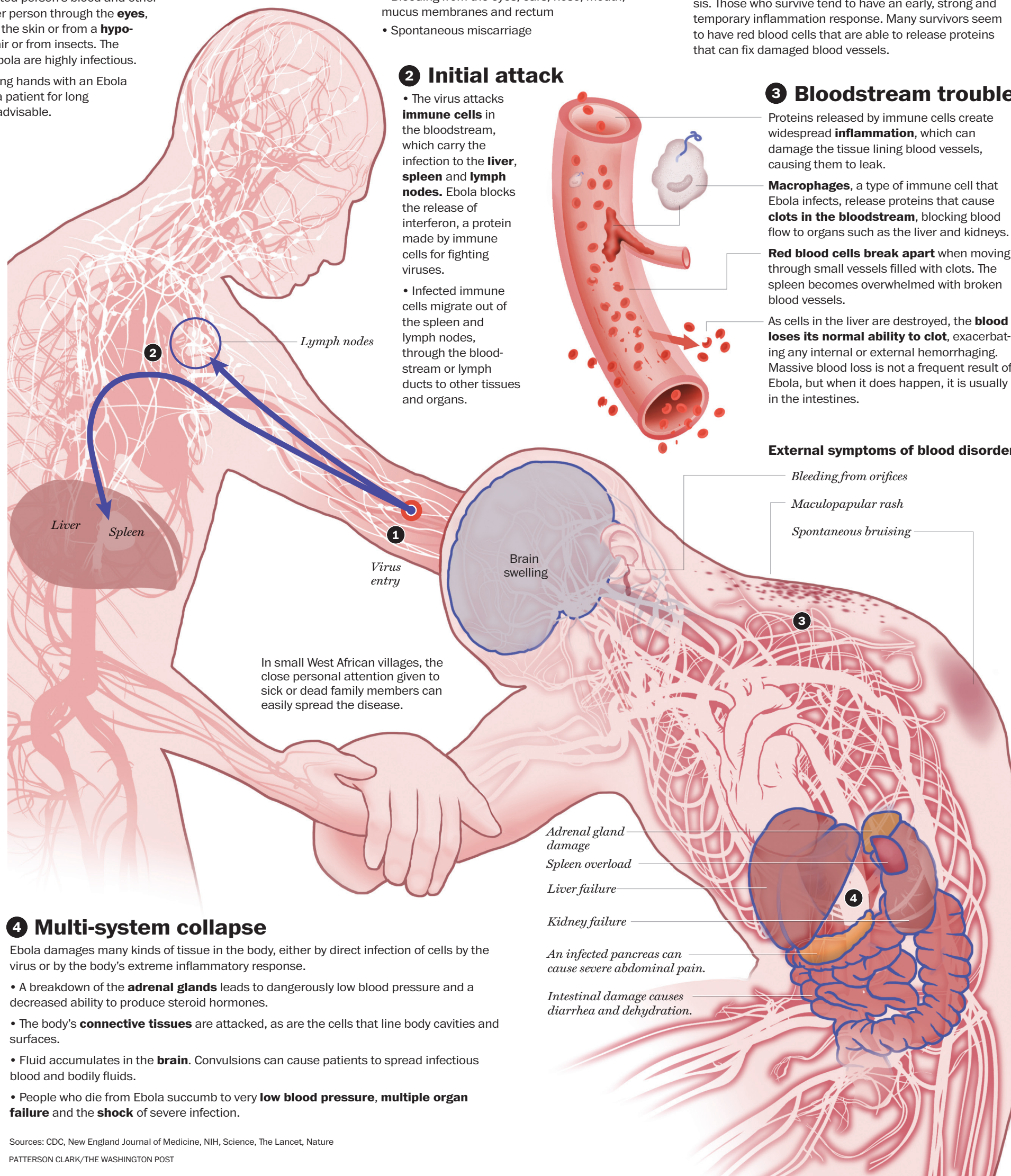
As cells in the liver are destroyed, the **blood loses its normal ability to clot**, exacerbating any internal or external hemorrhaging. Massive blood loss is not a frequent result of Ebola, but when it does happen, it is usually in the intestines.

External symptoms of blood disorder

Bleeding from orifices

Maculopapular rash

Spontaneous bruising



4 Multi-system collapse

Ebola damages many kinds of tissue in the body, either by direct infection of cells by the virus or by the body's extreme inflammatory response.

- A breakdown of the **adrenal glands** leads to dangerously low blood pressure and a decreased ability to produce steroid hormones.
- The body's **connective tissues** are attacked, as are the cells that line body cavities and surfaces.
- Fluid accumulates in the **brain**. Convulsions can cause patients to spread infectious blood and bodily fluids.
- People who die from Ebola succumb to very **low blood pressure, multiple organ failure** and the **shock** of severe infection.