

Living With (and Without) Neutropenia

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Is Infection Prevention Necessary?

- Neutropenic: Some preventive measures are reasonable
- Not neutropenic (resolved or on treatment):
Live a normal life!
- In between: depends on
 - ANC
 - and*
 - Mechanism of neutropenia (less risk with autoimmune and idiopathic)

ANC	Clinical Severity
1000-1500	No increased risk of infection
500-1000	Little or no increased risk of infection
200-500	Increased risk of infection
<200	Very high risk of infection

Risk also depends on

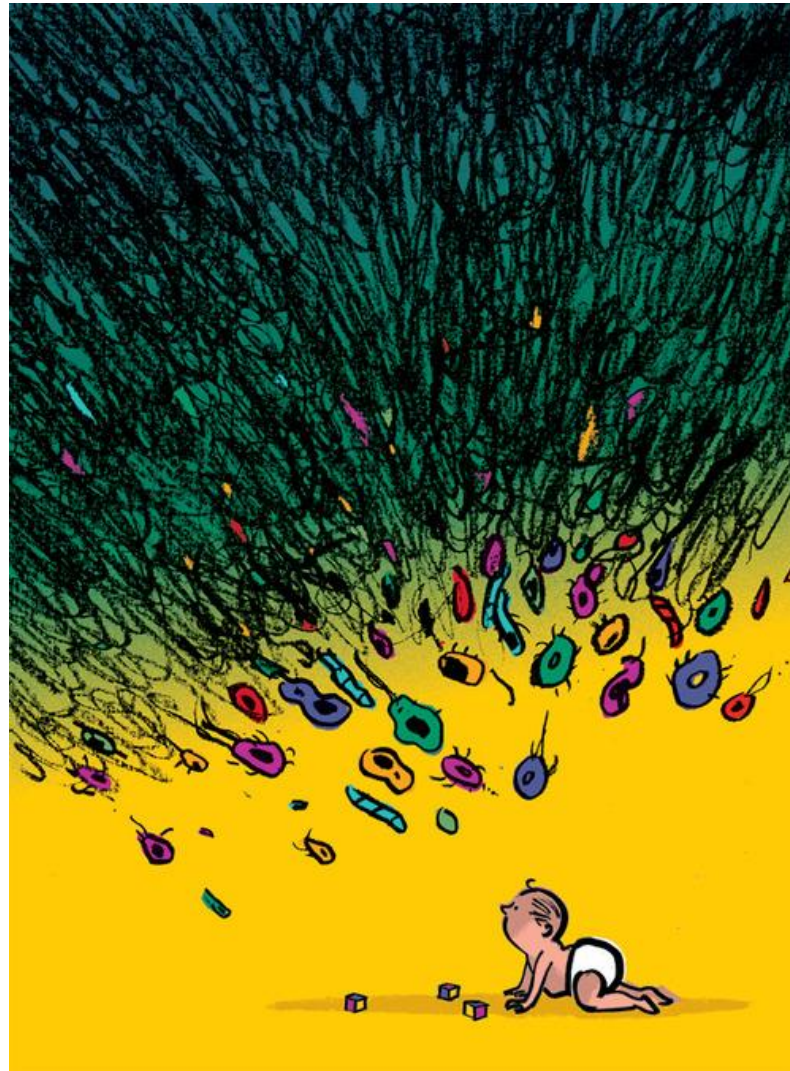
- duration of neutropenia: long-term is higher risk
- mechanism of neutropenia: destruction (e.g. autoimmune) is lower risk than lack of production (e.g. congenital).

The classification in this table is based largely on cancer patients receiving chemotherapy. They have additional risk factors of immune suppression, poor nutrition, central venous catheters, organ damage from the cancer, etc.

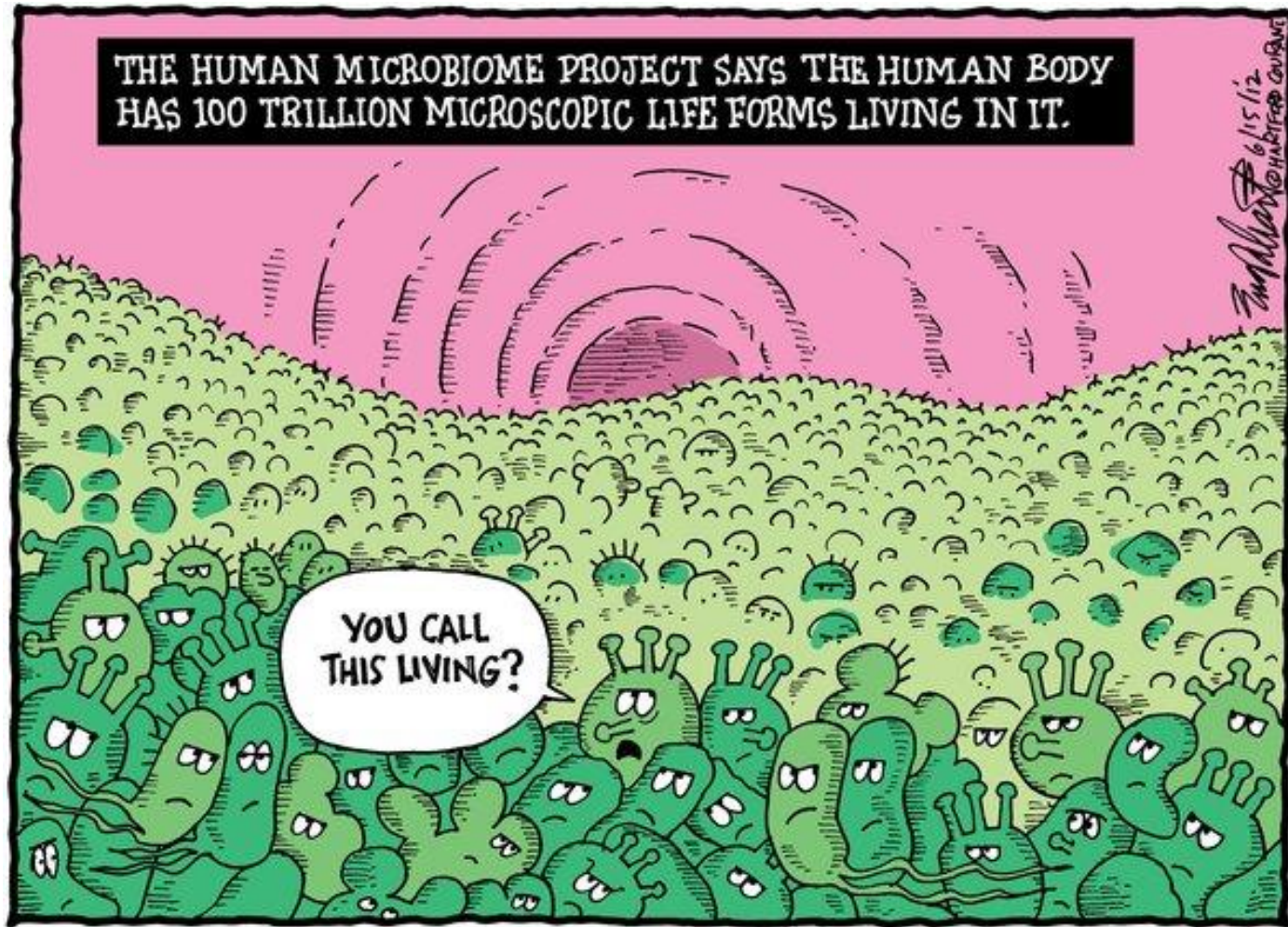
Human Immunity – Not Just Neutrophils (much as we love them)

- Surface barriers
 - Skin, mucous membranes, lungs, GI tract
- Reticuloendothelial system (liver, spleen)
- Hormonal Immunity
 - Antibodies, complement
- Cellular immunity
 - Neutrophils, monocytes/macrophages
 - T & B lymphocytes, NK cells

Are We Under Constant Attack by Microbes?

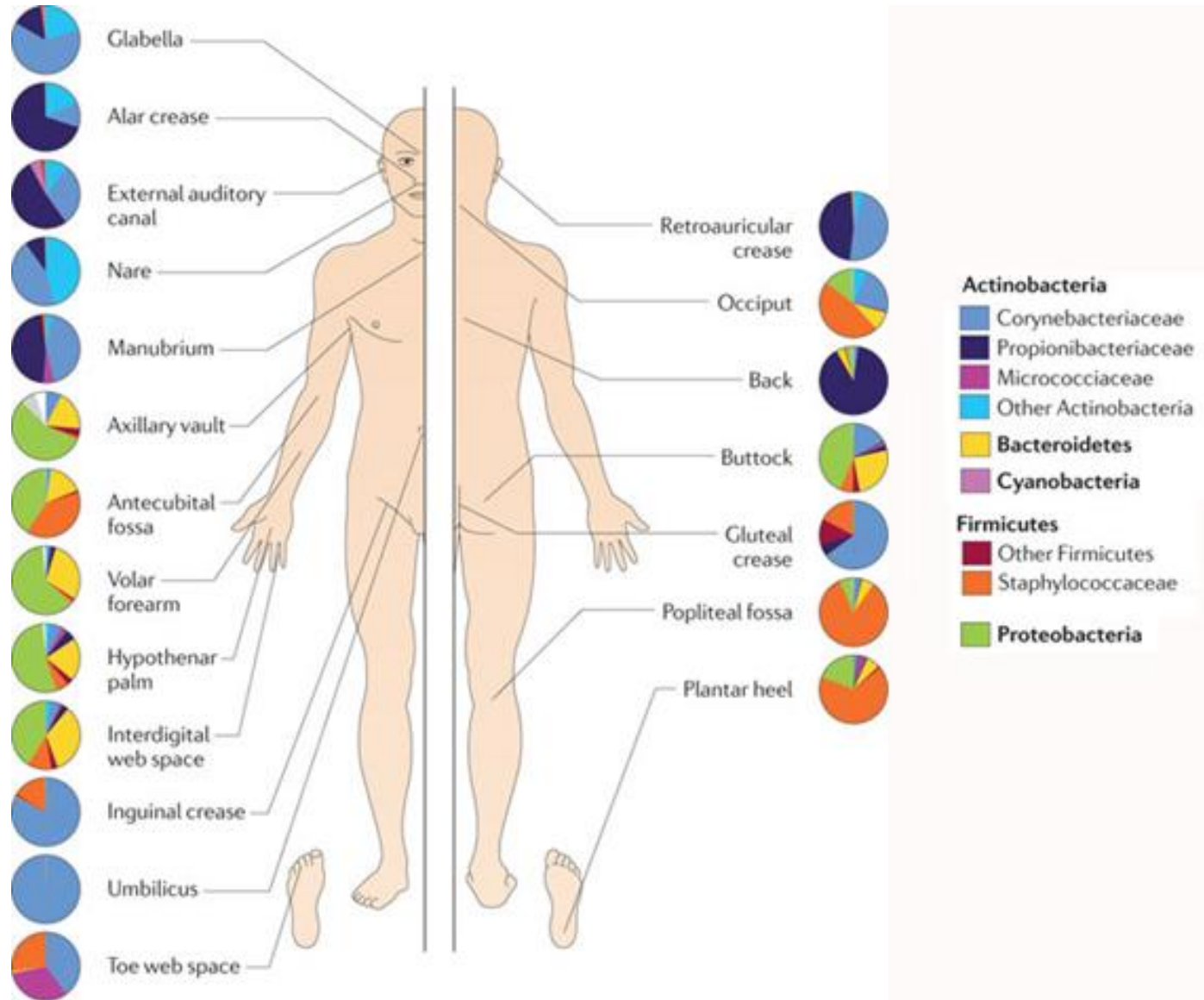


NO – they are already in and on us!



A human body contains 10 times as many microbial cells as human cells

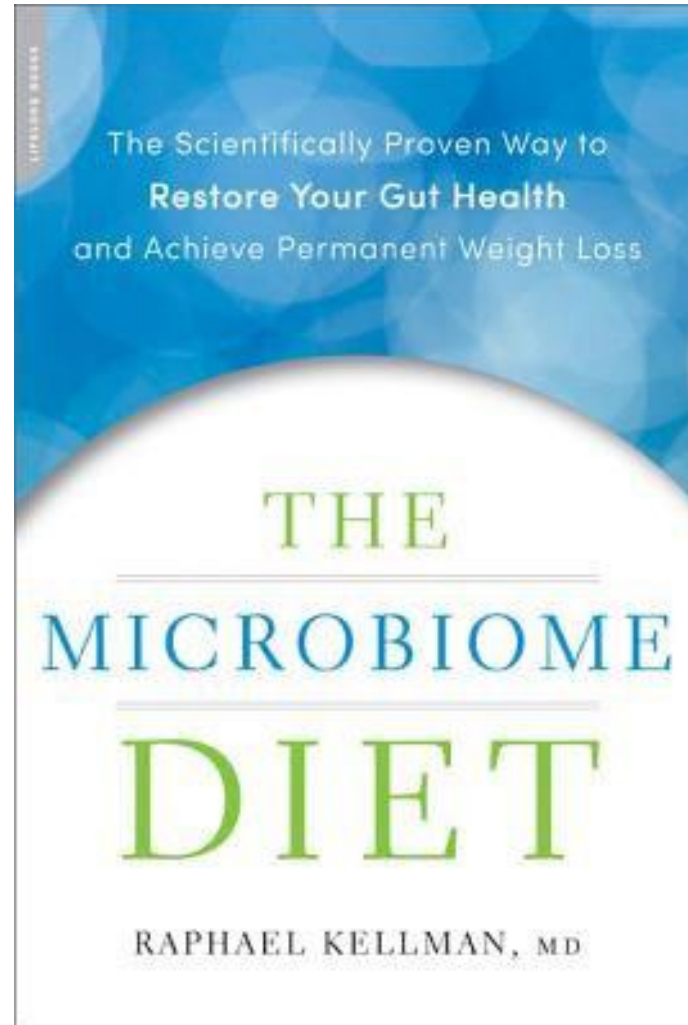
Every Body Part Has Its Own “Flora”



Hygiene Hypothesis: Dirt Is Good



Like every scientific idea,
it has already been turned into a diet.



Lessons from the Microbiome

- Most microbes are your friends
- Excessive hygiene removes your friends and opens the door to invaders
- Chronic or frequent antibiotic use alters the microbiome and encourages growth of antibiotic-resistant organisms

But What About “Bad Bugs?”

Lessons from the Hospital Studies

Effective precautions

- Hand washing!!!
- Laminar airflow and HEPA filtration
- Everything in between: not very effective

Ineffective precautions

- “Neutropenic diet”
- Gowns, gloves, etc.
- Prophylactic antibiotics
- Not studied, but by implication: disinfecting the home, disinfecting the playground, social isolation

Most infections in neutropenic patients come from their own bacteria

But I just said that most of our microbes are our friends!

Why good bugs go bad:

- Antibiotics
- Hospital environment
- Good bug in a bad place (e.g. the bloodstream)
- Breakdown of other defenses: skin, gums, intestinal wall, immune system

What are reasonable precautions?

Adapted from the NNN website:

- **Mouth Care:** This should include regular dental check ups. Excellent oral hygiene is very important.
- **Immunizations and Vaccinations:** People with neutropenia have an intact “adaptive” immune system that allows them to make normal antibodies protecting from the devastating effects of viral illnesses. Therefore all routine immunizations are recommended.
- **General Hygiene:** Thorough hand washing and attention to scrapes and cuts on the skin.
- **Foreign Travel:** Travel is an option but should always be considered with the counsel of your physician

Reasonable Precautions

Mouth Care:

- Avoid sweets
- Regular dental check ups
- Excellent oral hygiene
(brushing/flossing)
- antibacterial mouthwash ($\frac{1}{2}$ water and $\frac{1}{2}$ hydrogen peroxide mixture is better than alcohol-based wash)
- Fluoride toothpaste and treatment (gel, varnish, etc.)
- Periodontal care for chronic gum inflammation.
- Antibiotics for dental procedures? Probably not.

Reasonable precautions

Immunizations:

All routine immunizations according to the standard vaccination schedule of your country are recommended.

NO increased risk from
live virus vaccines

Reasonable precautions

General Hygiene:

- Thorough hand washing (but excessive washing can damage skin)
- Good nail care
- Cleaning of scrapes and cuts on the skin
- No rectal thermometers or suppositories

Foreign Travel:

- Consult your physician
- Study the CDC website

Reasonable precautions

Social interactions and school attendance

Most infections transmitted from other people are viral – neutropenia is not a factor in immunity

BUT fever can lead to MD or ER visits *and* rarely, viral infection can lead to secondary bacterial infection

Bottom line:

Balance small risk against psychosocial and educational benefits

Avoid obviously sick friends & relatives

Take-Home Messages

Adequate ANC (>1000): Live as normal a life as possible!

Low ANC: Reasonable precautions:

- Excellent mouth care and oral hygiene
- All routine immunizations
- Good hand washing
- Maintain social interactions and school attendance
- Enjoy travel, with the counsel of your physician

You may have noticed – these measures are good for everybody!