


Disease Transmission and Control in the Home Setting
Teleclass Presented by Dr. Charles Gerba, University of Arizona
March 20, 2003

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Disease Transmission and Control in the Home Setting

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Webber Training Teleclass – March 20, 2003

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“Water disinfection and personal hygiene ended the age of epidemics.”

“The development of antibiotics and vaccines have had only a small impact on mortality.”

V. Greene

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The Home is a Multifunctional Setting

- A residence
- restaurant
- day care setting
- a hospital
- and animal shelter

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Significance of Hygiene in the Home

- Most foodborne infections occur in the home
- Cross contamination is the cause of 30% of the *Salmonella* outbreaks
- 2/3 of all colds originate in the home setting

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Sources of Pathogens Within the Home

- People
- Pets
- Food
- Water
- Air
- Fomites (Inanimate Objects)

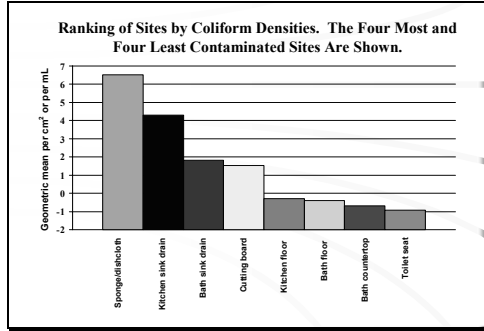
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The Germest Areas in the Home

- Kitchen
 - cleaning tools (sponge or dishcloth)
 - sink
 - cutting board
- Bathroom
 - sink
- Washing machine
- Playroom or child's bedroom

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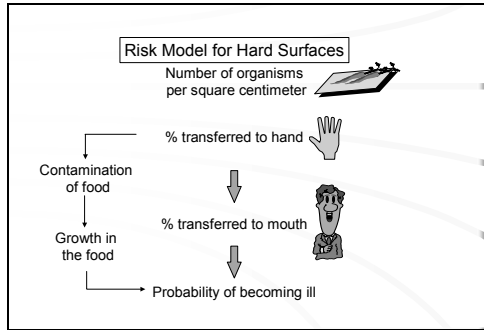


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Importance of Hands in Disease Transmission

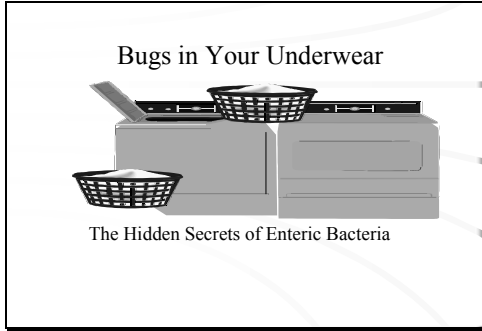
- A small child will bring their hands to their nose or mouth once every three minutes
- A child will swallow the amount of household dust found on six kitchen floor tiles per day
- A working adult will touch as many as 30 objects in one minute
- The hands are the major route of transmission for colds and many enteric diseases

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Occurrence of Coliforms and Fecal Coliforms in Wash Water After Laundering

Type of Clothing	Coliform Arithmetic Average		Fecal Coliform Arithmetic Average	
	Washer Load	Per Item	Washer Load	Per Item
Underwear	5.2×10^6	4.5×10^5	5.6×10^5	7.4×10^4
Jeans	7.2×10^5	1.07×10^5	1.5×10^4	2.24×10^3
Bath Towels	1.2×10^6	1.77×10^3	$<1.6 \times 10^4$	ND

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Occurrence (%) of Coliforms and *E. coli* in Washing Machines and Laundered Clothes*

Sample	Coliforms	<i>E. coli</i>
Surface of Drum*		
Before cycle	26	2
After cycle	25	5
Cloth swatch	44	16
Final Rinse Water**	25	1.5

*Results from 140 samples collected from households
 **10 ml samples
 +swab of 10 cm²

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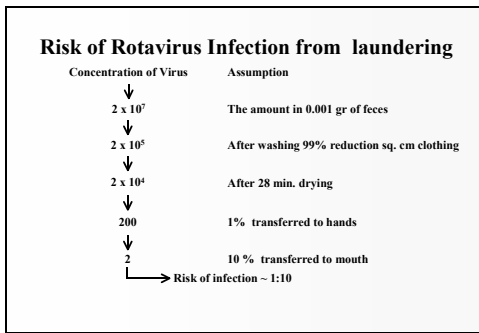
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Transfer of Bacteria between Fabrics

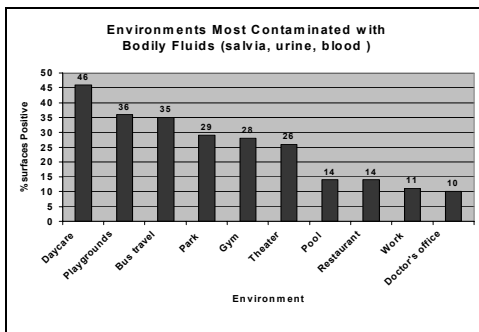
Organism	CFU log ₁₀ Recovered After Laundering		CFU log ₁₀ Recovered After Drying	
	Inoculated Swatches	Sterile Swatches	Inoculated Swatches	Sterile Swatches
<i>S. aureus</i>	5.3	4.8	3.5	2.8
<i>E. coli</i>	6.0	5.2	<1.4	<1.4
<i>S. typhimurium</i>	6.0	4.2	1.2	<1.4
<i>M. fortuitum</i>	5.9	5.8	5.6	5.6

Swatches contained 8.1 to 8.5 CFU log₁₀ of organisms recovered before washing

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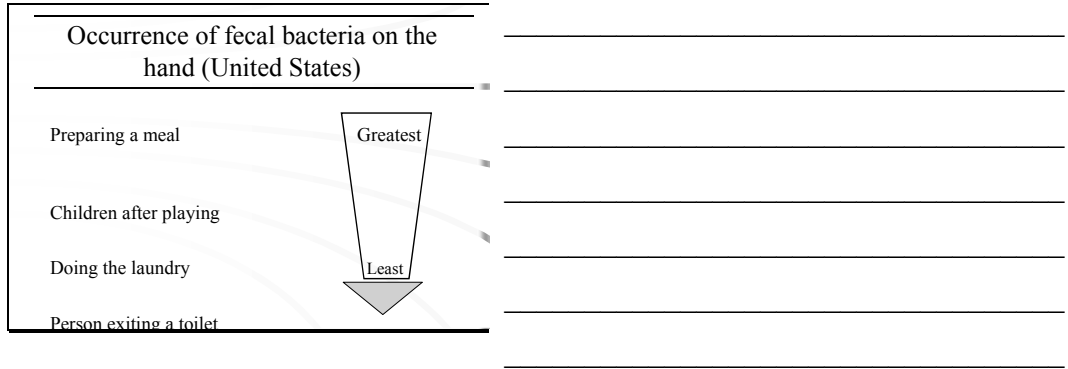


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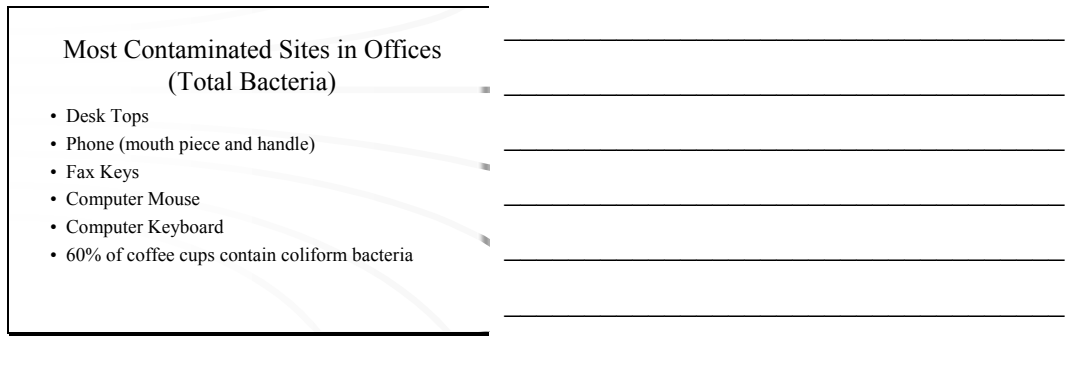


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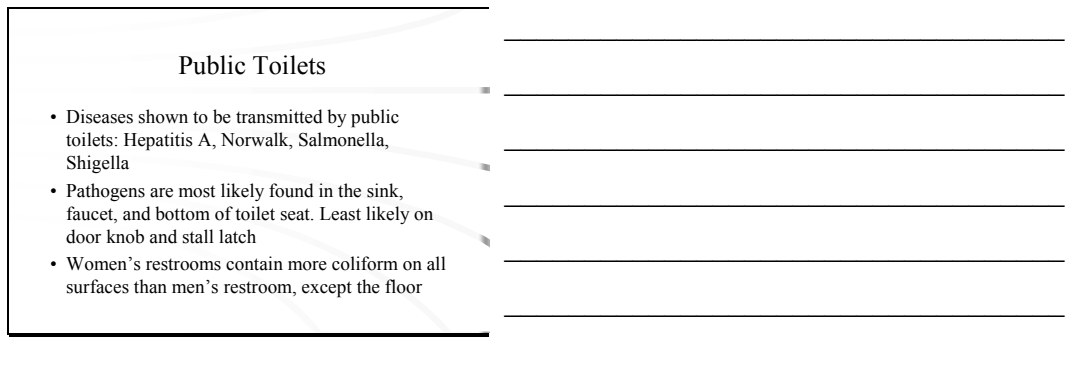
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Public Toilets

- Institutional restrooms are the most contaminated, while fast food restaurants and hospitals are the cleanest
- *E. coli* and *Salmonella* most commonly isolated from the restroom sink
- Salmonella found in 3% of the sinks tested

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Goals of Home Hygiene

- Identify those places where you are most likely to come into contact with pathogens
- It is not to kill all microorganisms, but to target the reduction and killing of pathogenic microorganisms to levels that present no significant risk of infection
- To accomplish this goal is not by more cleaning, but by the development of better cleaning tools and products

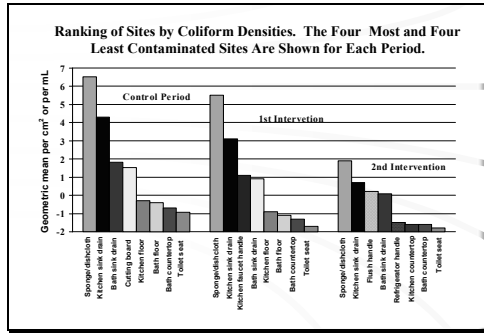
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Types of Products that Aid Hygiene in the Home

- Disposable cleaning tools (e.g. paper towels, disinfecting wipes)
- Cleaning tools which prevent the growth of bacteria (e.g. antimicrobial sponges)
- Self disinfecting or antimicrobial surfaces (e.g. cutting boards)
- Products which both clean and disinfect
- Hand sanitizers (alcohol gels)

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Cleaning Protocols for Phase 3 of the Study

Kitchen surface	Cleaning and Disinfecting Method	Frequency
Sponge or dishcloth	Soak in bleach 5 - 10 min.	3 / week
Countertop, cutting board, handles	Spray with disinfectant cleaner, wipe clean after 30 sec.	daily
Floor around kitchen sink	Spot clean with disinfectant cleaner, wipe clean after 30 sec.	daily
	Mop with disinfectant, let stand 5 min., rinse	3/ week