

CHEMICAL GERMICIDES IN PERSONAL SERVICES: HOW EFFECTIVE, RELEVANT AND SAFE ARE THEY?

SYED A SATTAR, Ph.D.
CENTRE FOR RESEARCH ON ENVIRON. MICROBIOLOGY (CREM)
FACULTY OF MEDICINE, UNIVERSITY OF OTTAWA
OTTAWA, ONTARIO, CANADA

MAY 2002

Syed A. Sattar, OHHA Conf., May 2002

1

WHY THE CONCERN?

- **BODY PIERCING/TATTOOING ARE HIGH-RISK ACTIVITIES**
- **INCREASING NUMBERS OF PRACTITIONERS & CLIENTS AS SUCH PRACTICES HAVE GONE MAINSTREAM**
- **WIDE VARIATIONS IN QUALITY OF SERVICE**
- **CLIENTELE IS VARIED & MAY VISIT ONLY ONCE**

Syed A. Sattar, OHHA Conf., May 2002

2

CONCERN (CONT'D.)

- **TYPE & DURATION OF PROCEDURE VARY WIDELY**
- **CLIENTS NOT OBLIGED TO REVEAL HEALTH STATUS**
- **RISK OF INFECTIONS TO CLIENT AS WELL AS PRACTITIONER**
- **DISEASE MAY APPEAR LONG AFTER PROCEDURE**
- **INFECTION OF SITE(S) AFTER THE PROCEDURE**

Syed A. Sattar, OHHA Conf., May 2002

3

CONCERN (CONT'D.)

- **STUDIOS VARIED IN LAYOUT & OFTEN CROWDED**
- **INFECTION CONTROL PRACTICES VARIED & OFTEN INADEQUATE**
- **INADEQUATE NATIONAL DATA ON SUCH SERVICES**
- **PUBLIC HEALTH INSPECTORS NEED GUIDANCE IN ENSURING PROPER INFECTION CONTROL**

Syed A. Sattar, OHHA Conf., May 2002

4

IS THERE RISK OF INFECTION IN PERSONAL SERVICES?

- **YES, BECAUSE OF DAMAGE TO INTACT SKIN AND/OR MUCOUS MEMBRANES**
- **WIDE VARIATIONS IN LEVEL OF EDUCATION & EXPERIENCE IN PRACTITIONERS**
- **KNOWLEDGE OF BASIC INFECTION CONTROL OFTEN INADEQUATE**
- **REPORTS OF VIRAL & BACTERIAL INFECTIONS**

Syed A. Sattar, OHHA Conf., May 2002

5

WHAT IS THE EVIDENCE?

- **A RECENT SURVEY (JOHNSON ET AL. 2001) OF MANICURE & PEDICURE ESTABLISHMENTS IN TORONTO POINTS TO:**
 - **POOR VACCINATION RATES**
 - **SPORADIC BARRIER PROTECTION**
 - **SERIOUS GAPS IN KNOWLEDGE OF INFECTION CONTROL & BLOODBORNE PATHOGENS**
 - **DECONTAMINATION PRACTICES FLAWED**

Syed A. Sattar, OHHA Conf., May 2002

6

BODY PIERCING/TATTOOING & INFECTIONS
(MAYERS ET AL., MAYO CLINIC PROC. 77: 29-34, 2002)

- A SURVEY OF UNDERGRADS IN NEW YORK STATE
- 51% HAD BODY PIERCED & 23% HAD TATTOOS
- 9% (21/229) OF COMPLICATIONS FROM PIERCING DUE TO BACTERIAL INFECTIONS
- PIERCED NAVELS MORE PRONE TO INFECTIONS
- NO COMPLICATIONS FROM TATTOOING (?)
- NO CASES OF VIRAL INFECTIONS (?)

Syed A. Sattar, OHHA Conf., May 2002

7

WHAT PATHOGENS ARE IMPORTANT?

- VIRUSES
 - HIV, HBV, HCV, HERPES, POX (M. CONTAGIOSUM), PAPILOMA, ETC.
- BACTERIA
 - PSEUDOMONAS, STAPHYLOCOCCUS, STREPTOCOCCUS, CLOSTRIDIUM TETANI, ETC.
- MYCOBACTERIA
 - MYCOBACTERIUM TUBERCULOSIS, M. LEPRAE, NON-TUBERCULOUS MYCOBACTERIA (E.G., M. ABSCESSUS), ETC.
- PROTOZOA
 - MALARIAL PARASITES (?), ETC.

Syed A. Sattar, OHHA Conf., May 2002

8

EXAMPLES OF INFECTIONS DUE TO PERSONAL SERVICES

| Infection | Procedure | Reference |
|---|-----------------|--|
| HBV | Piercing | Tweeten et al. Clin Infect Dis 1998;26:735-740 |
| HCV | Tattoo/Piercing | Baum. Healthstate 1996;14:15-19; Dian-Xing et al. Lancet 1996;347:541; |
| HIV | Body Piercing | Ross et al. Clin Infect Dis 1998;26:767-768 |
| Mastitis (<i>M. abscessus</i>) | Body Piercing | Trupiano et al. Clin Infect Dis 2001;33:131-134 |
| <i>S. aureus</i> / <i>P. aeruginosa</i> | Ear piercing | Tweeten et al. Clin Infect Dis 1998;26:735-740 |
| Syphilis | Tattoo | Long et al. Clin Infect Dis 1994;18:610-619 |
| Tetanus | Body Piercing | O'Malley et al. Clin Infect Dis 1998;27:1343 |
| Toxic Shock Syndrome | Tattoo | Long et al. Clin Infect Dis 1994;18:610-619 |

Syed A. Sattar, OHHA Conf., May 2002

9

A RECENT REPORT OF MYCOBACTERIOSIS

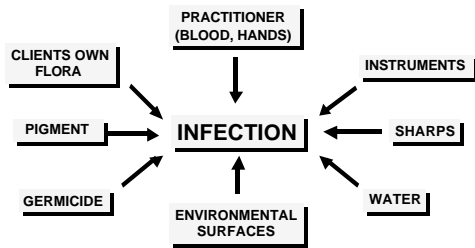
(50th Ann. Meeting of Epidemic Intelligence Service, April, 2001)

- IN WATSONVILLE (CALIF.) >110 CASES OF ANTIBIOTIC-RESISTANT BOILS DETECTED
- ALL PATIENTS CUSTOMERS OF SAME PEDICURE SALON
- BOILS SEEN 10 DAYS TO 4 MONTHS AFTER PROCEDURE
- RAZOR-SHAVING OF LEGS INCREASED RISK OF INFECTION
- *MYCOBACTERIUM FORTUITUM* CAUSATIVE AGENT, WITH THE FOOTBATH AS SOURCE
- THE BACTERIA GREW ON A SUCTION SCREEN PLUGGED WITH HAIR, GREASE & CLIPPED NAILS
- EQUIPMENT WAS NEVER CLEANED OR DISINFECTED

Syed A. Sattar, OHHA Conf., May 2002

10

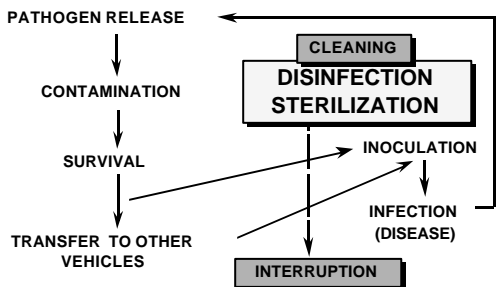
SOURCES OF INFECTION IN PERSONAL SERVICES



Syed A. Sattar, OHHA Conf., May 2002

11

INTERRUPTING DISEASE SPREAD VIA VEHICLES



Syed A. Sattar, OHHA Conf., May 2002

12

WHERE ARE CHEMICAL GERMICIDES USED IN PERSONAL SERVICES?

- SKIN OR MUCOUS MEMBRANE OF CLIENT
- HANDS OF PRACTITIONER
- ENVIRONMENTAL SURFACES
- INSTRUMENTS

Syed A. Sattar, OHHA Conf., May 2002

13

MAJOR TYPES OF DISINFECTANTS

A) HALOGENS

1) CHLORINE: GAS, LIQUID OR POWDER

- USED AT 100-10,000 PPM FREE CHLORINE
- BROAD-SPECTRUM, CHEAP, MULTI-PURPOSE
- INSTABLE, CORROSIVE, PH DEPENDENT
- TOXIC AND HAZARDOUS TO ENVIRONMENT
- NEUTRALIZED BY ORGANIC MATTER
- DEMAND-RELEASE CHLORINE COMPOUNDS
- CHLORINE DIOXIDE - ON-SITE GENERATION

Syed A. Sattar, OHHA Conf., May 2002

14

DISINFECTANT TYPES (cont'd.)

2) IODINE: FREE OR COMBINED

- 30 TO 1000 PPM FREE IODINE
- MANY USES; STAINS TREATED OBJECTS
- NEUTRALIZED BY ORGANICS
- SOLUTION IN ALCOHOLS (TINCTURE)
- TOXIC AND CORROSIVE
- USE ON SKIN & MUCOUS MEMBRANES
- BACTERIAL GROWTH IN ORGANIC IODINE

Syed A. Sattar, OHHA Conf., May 2002

15

DISINFECTANT TYPES (cont'd.)

B) ALCOHOLS: ETHYL (40-90%), ISOPROPYL (60-95%)

- **FIXATIVE ACTION**
- **MULTIPLE USES INCLUDING ANTISEPSIS**
- **NO RESIDUE, NON-CORROSIVE**
- **FLAMMABLE AND POTENTIAL FOR ABUSE**
- **NON-SPORICIDAL; VIRUCIDE AT HIGH CONC.**
- **MAY AFFECT AIR QUALITY**
- **DAMAGE TO PARTS OF MEDICAL INSTRUMENTS**

Syed A. Sattar, OHHA Conf., May 2002

16

DISINFECTANT TYPES (cont'd.)

C) PHENOLICS: 400-2,500 PPM

- **GENERALLY USED WITH DETERGENTS**
- **PUNGENT, UNPLEASANT SMELL**
- **LIMITED ACTIVITY AGAINST VIRUSES**
- **TOXIC IN SOME FORMS**
- **NOT RECOMMENDED IN CHILD-CARE AND
FOOD PREPARATION AREAS**
- **MAY BE ABSORBED BY RUBBER**

Syed A. Sattar, OHHA Conf., May 2002

17

DISINFECTANT TYPES (cont'd.)

D) QUATERNARY AMMONIUMS

- **500-2,500 PPM; BUILT-IN DETERGENT ACTION**
- **GENERALLY PLEASANT AND RELATIVELY MILD**
- **COMMONLY USED IN NORTH AMERICA**
- **OFTEN USED WITH OTHER TYPES OF ACTIVES**
- **GOOD BACTERICIDES; POOR VIRUCIDES,
MYCOBACTERICIDES AND SPORICIDES**
- **ENVIRONMENTAL CONCERNS**

Syed A. Sattar, OHHA Conf., May 2002

18

DISINFECTANT TYPES (cont'd.)

F) HYDROGEN PEROXIDE

- 3 TO 30% SOLUTION IN WATER; STRONG OXIDANT
- NO RESIDUE; ENVIRONMENTALLY SAFE
- SPORICIDAL AT HIGHER CONC.
- EXPLOSIVE AT HIGH CONC.; MAY BE CORROSIVE
- STABILIZED SOLUTIONS WITH ORGANIC ACIDS
- ACCELERATED ACTION
- INCREASING USE
- PERACETIC ACID

Syed A. Sattar, OHHA Conf., May 2002

19

COMMON ANTISEPTICS

- ALCOHOLS
- IODINE
- HYDROGEN PEROXIDE
- TRICLOSAN
- TRICLOCARBAN
- CHLORHEXIDINE GLUCONATE
- BENZALKONIUM CHLORIDE
- PARACHLOROMETAXYLENOL (PCMX)

Syed A. Sattar, OHHA Conf., May 2002

20

HAZARDS IN GERMICIDE USE

- CHLORINE IS TOXIC TO HUMANS & ENVIRONMENT
- PHENOLICS CAN CAUSE LIVER DAMAGE, SKIN DEPIGMENTATION & SKIN BURNS
- ETHANOL IS FLAMMABLE & CAN BE ABUSED
- HYDROGEN PEROXIDE CAN CAUSE BLEACHING & SKIN BURNS
- VOLATILE ORGANICS & SMOG

Syed A. Sattar, OHHA Conf., May 2002

21

HAZARDS IN GERMICIDE USE (cont'd.)

- VOLATILE ORGANICS & INDOOR AIR QUALITY
- HORMONE DISRUPTERS
- ACCIDENTAL INGESTION AND POISONING
- UNDESIRABLE MICROBES IN GERMICIDES
- ARE GERMICIDE & ANTIBIOTIC RESISTANCE LINKED?

Syed A. Sattar, OHHA Conf., May 2002

22

DESIRED TRAITS IN A GERMICIDE

- GOVERNMENT REGISTERED
- NON-TOXIC TO HUMANS & ANIMALS
- NON-ALLERGENIC & NON-SENSITIZING
- NON-HORMONE DISRUPTING
- ENVIRONMENTALLY FRIENDLY
- BROAD-SPECTRUM GERMICIDAL ACTIVITY
- FAST-ACTING
- NON-STAINING & FREE OF ANY PUNGENT SMELL

Syed A. Sattar, OHHA Conf., May 2002

23

DESIRED TRAITS (cont'd.)

- FREE FROM VOLATILE ORGANIC CHEMICALS (VOC'S)
- SHELF-LIFE OF ONE YEAR OR LONGER
- SAFE TO TRANSPORT, & SAFE/EASY TO STORE
- NO RESIDUAL ACTIVITY(?)
- NOT READILY NEUTRALIZED BY SOIL LOAD
- NON-CORROSIVE & MATERIALS COMPATIBLE
- COST-EFFECTIVE
- EASY TO USE WITH CLEAR LABEL DIRECTIONS

Syed A. Sattar, OHHA Conf., May 2002

24

CHECKLIST FOR INFECTION CONTROL

- IS SERVICE PROVIDER AWARE OF RISKS OF SPREAD OF INFECTIONS?
- HOW & HOW OFTEN ARE ENVIRONMENTAL SURFACES BEING CLEANED?
- ARE REQUIRED STERILIZERS AVAILABLE?
 - ARE THEY INSTALLED PROPERLY?
 - ARE THEY BEING USED PROPERLY?
- WHAT CHEMICAL GERMICIDES ARE AVAILABLE?
 - ARE THEY BEING DILUTED, STORED & USED PROPERLY?
- ARE REUSABLE DEVICES BEING CLEANED WELL BEFORE DISINFECTION OR STERILIZATION?

Syed A. Sattar, OHHA Conf., May 2002

25

CHECKLIST FOR INFECTION CONTROL (CONT'D.)

- ARE HANDS BEING WASHED FREQUENTLY & PROPERLY?
- IS FACILITY USING ALCOHOL-BASED HAND ANTISEPTICS?
 - IF SO, WHAT IS THE TYPE & LEVEL OF ALCOHOL IN THEM?
 - ARE THEY STORED PROPERLY TO PREVENT EVAPORATION OF ALCOHOL?
- HOW IS CLIENT'S SKIN OR MUCOUS SURFACE BEING DISINFECTED BEFORE PROCEDURE?
- HOW ARE HEAT-SENSITIVE INSTRUMENTS BEING DECONTAMINATED BETWEEN PATIENTS?
- VACCINATION STATUS OF SERVICE PROVIDER?

Syed A. Sattar, OHHA Conf., May 2002

26

CHECKLIST FOR PHYSICAL FEATURES

- GENERAL CLEANLINESS
- EASILY CLEANABLE ENVIRONMENTAL SURFACES
- GOOD LIGHTING & VENTILATION
- PROPER HANDWASHING FACILITIES (PREFERABLY WITH WRIST OR FOOT-OPERATED FAUCETS), WITH WELL STOCKED DISPENSERS FOR SOAP & PAPER TOWELS
- WELL-SEPARATED CLEAN & DIRTY WORKING AREAS
- INSTRUMENTS THAT CAN BE READILY CLEANED & DISINFECTED/STERILIZED

Syed A. Sattar, OHHA Conf., May 2002

27

CHECKLIST FOR PHYSICAL FEATURES (CONT'D.)

- ADEQUATE SUPPLY & PROPER STORAGE OF STERILE SHARPS FOR SINGLE USE
- DISCARD BINS FOR PROPER DISPOSAL OF SHARPS
- STOCK OF GLOVES
- PROPER STERILIZERS WITH RELATED SUPPLIES
- CHEMICAL GERMICIDES IN APPROPRIATE CONTAINERS

Syed A. Sattar, OHHA Conf., May 2002

28

CONCLUDING REMARKS

- CANADIAN GUIDELINES PUBLISHED IN 1999
- AMERICAN *Body Art Model Code and Guideline*
 - PROVIDES ASSISTANCE TO REGULATORY AGENCIES WISHING TO REGULATE PIERCING
 - CURRENTLY, 42% OF STATES INVOLVED IN REGULATING BODY PIERCING
 - REGULATIONS FOR TATTOOING ALSO UNDER CONSIDERATION
- 'ARTISTIC FREEDOM' & PATIENT/PRACTITIONER SAFETY

Syed A. Sattar, OHHA Conf., May 2002

29

CONCLUSIONS (CONT'D.)

- INFORMED CONSENT FROM CLIENT
- SELF-REGULATION BY INDUSTRY (ALLIANCE OF PROFESSIONAL TATTOOISTS (ART)
- REGISTRATION OF STUDIOS/PARLORS
- IN-HOME PROCEDURES WILL REMAIN HARD TO MONITOR

Syed A. Sattar, OHHA Conf., May 2002

30

RECOMMENDATIONS

- **DEVELOP A NATIONAL INVENTORY OF STUDIOS/PARLORS**
- **DEVELOP STANDARDIZED CHECKLISTS FOR HEALTH INSPECTORS**
- **EDUCATE PRACTITIONERS ON:**
 - **IMPORTANCE OF PERSONAL & CLIENT SAFETY**
 - **BASICS OF INFECTION CONTROL**
 - **PREVENTIVE VACCINATION**

Syed A. Sattar, OHHA Conf., May 2002

31

RECOMMENDATIONS (CONT'D.)

- **INFORM CLIENTS OF RISKS THROUGH BROCHURES**
- **CONSIDER PIERCING/TATTOOING IN CASES OF UNEXPLAINED INFECTIONS**
- **URGE PRACTITIONERS TO CONSULT HEALTH AUTHORITIES PRIOR TO BUILDING OR RENOVATING STUDIOS**

Syed A. Sattar, OHHA Conf., May 2002

32

FURTHER READING

- **British Columbia (1997). Guidelines for Tattooing. Ministry of Health, Victoria, B.C.**
- **Hayes, MO & Harkness, GA (2001). Body piercing as a risk factor for viral hepatitis: An integrative research review. Am J Infect Control 29: 271-274.**
- **Hlth Canada (1999). Infection prevention and control practices for personal services: tattooing, ear/body piercing, and electrolysis. Can Commu Dis Rep 25S3, 73 pages.**
- **Johnson IL et al., (2001). Survey of infection control procedures at manicure and pedicure establishments in North York. Can J Pub Hlth 92: 134-137.**
- **Mayers et al. (2002). Prevalence of body art (body piercing and tattooing) in university undergraduates and incidence of medical complications. Mayo Clin Proc 77:29-34.**
- **Tweeten SSM & Rickman LS (1998). Infectious complications of body piercing. Clin Infect Dis 26: 735-740.**

Syed A. Sattar, OHHA Conf., May 2002

33

ACKNOWLEDGMENTS

- **CIPHI & LUCIE IMBISCUSO FOR THE INVITATION**
- **JASON TETRO FOR HELP IN THE PREPARATION OF THIS PRESENTATION**

THIS PRESENTATION AND ADDITIONAL
INFORMATION AVAILABLE AT CREM WEBSITE
ENVIRONMENTAL-MICROBIOLOGY.CA

Syed A. Sattar, OHHA Conf., May 2002

34
