

# **GUIDELINES FOR HYGIENIC TESTING**

## **THE PREVENTION OF INFECTIONS DURING PSYCHOPHYSIOLOGICAL RESEARCH**

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## PREFACE

Despite the small scale at which psychophysiological research is conducted within the Faculty of Social Sciences, this kind of research requires specific guidelines because of the many respects in which it differs from non-psychophysiological research. The difference between physiological and non-physiological research is often strikingly reflected by remarks of participating subjects, like “Gosh, this place looks just like a hospital...” Such an observation is correct in that psychophysiological research often involves procedures that have a medical appearance: attaching electrodes, sampling of blood or saliva, measuring blood pressure, etc.

Although it is true beyond doubt that chances of an infection during psychophysiological experiments are smaller than in medical settings, one can think of several arguments for placing more emphasis on a hygienic way of working.

- 1) Physiological research often involves action in which physical contact between the **subject** (marked **S**) and the **experimenter** (marked **E**) takes place.
- 2) Often, instruments are used that come into direct contact with the S (blunt or sharp needles, electrodes, etc.)
- 3) Research generally takes place at the same location for all Ss and is performed by the same E with the same instruments.

It readily follows from these three arguments that relatively harmless infections such as the flue or a cold can easily spread from S to E and from E to S. This, however, is in essence not different from other psychological research. The whole idea changes when you realize that:

- 4) Extraction of body fluids (blood, saliva, etc.) from the S can be performed on purpose, or can happen unintentionally (e.g., by damage to the skin).

Physiological research thus involves the possibility that participants (S as well as E) come into contact with body fluids of other people either through direct contact or through contact with instruments (of any kind). It should be clear that the transmission of dangerous infections such as Hepatitis-B or HIV (AIDS) is not precluded. Finally, it can be remarked that:

- 5) During many physiological experiments, chemicals (alcohol, collodium, acetone, disinfectants, etc.) are used, all of which are volatile and many of which are stupefying, toxic or corrosive.
- 6) All aspects of research (recruitment of Ss, preparations, the experiment itself, actions and conversations after the experiment) need to be structured in such a way that the mental well-being of the subject is not endangered.

In the following, a number of recommendations are made concerning the hygienic procedures in psychophysiological research. The recommendations are based on the guidelines for the health care of the Health Council of the Min. of Public Health and Environmental Hygiene (1977) and the Centres of Disease Control of the US. Dept. of Health and Human Services (1987). In addition, they closely resemble the recommendations in the ‘SPR ad hoc committee on the prevention of disease transmission’, titled: ‘Guidelines for reducing the risk of disease transmission in the psychophysiology laboratory’ (Putnam, Johnson & Roth, 1992). A compromise was aimed for between the stringent demands in the health care sector, on the one hand, and the everyday routine of psychophysiological research, on the other hand. The resulting guidelines compensate for lack of knowledge of hygienic conduct. If the guideline is to have any chance of success, a change in mentality among the people involved will have to take place. If one individual chooses to work under the assumption that “it won’t come to difficulties”, setting of guidelines is useless - despite the effort of a majority.

# GUIDELINES FOR THE PREVENTION OF INFECTIONS DURING PSYCHOPHYSIOLOGICAL RESEARCH

## 1. General

- 1.1. The following guidelines apply, inside the laboratory, to:
  - all units that are used for psychophysiological research,
  - all people who participate in psychophysiological research,
  - all people who enter units meant for psychophysiological research (researchers, students, technical personnel, cleaning personnel, etc.).
- 1.2. A number of guidelines serve as **recommendations** (marked **R**). Other guidelines serve as **prescriptions** (marked **P**). They have to be executed without exception. It is not permissible to obey some prescriptions and not to obey others. Note: other people use the same units and equipment!
- 1.3. Act on the assumption that *all* subjects and experimenters may be infected.
- 1.4. When research involves a reasonable chance of blood-to-blood contact, a hepatitis vaccination is recommended (**R**).
- 1.5. In supervisor-student situations, the final responsibility for safety and hygiene lies with the supervisor. He/she should care for the student's awareness of these guidelines and should, in addition, see to it that they are, in fact, being complied with.
- 1.6. The board of the Faculty of Social Sciences has the following responsibilities:
  - Keeping the guidelines up to date
  - Advising about central laboratory supplies
  - Checking the practical attainability of the given recommendations
  - Bringing the guidelines to the attention of students and personnel
  - Supplying supplementary advice/information, also to individual researchers
  - Supervising compliance to the guidelines

## 2. People

- 2.1. Postpone the experiment in case of a flue, heavy cold or other infection of the experimenter or the subject (see argument 1, 2 and 3) (**R**).
- 2.2. Pay attention to good general bodily and clothing hygiene while conducting research (**R**).
- 2.3. Always wear (disposable) gloves during physiological activities/preparations:
  - a) cleaning or abrading the subject's skin (**P**)
  - b) attaching electrodes to the clean/abraded skin (**P**)
  - c) removing electrodes (**P**)
  - d) all actions involving blood, sperm or vaginal juices (**P**)
  - e) working with disinfectants (**P**)
  - f) in case of clearly visible wounds or irritation of the skin of S or E (**P**).
  - It is recommended to wear gloves with *all* physiological activities/preparations.
  - Wearing gloves reduces but does not preclude totally the possibility of blood contact.  
See: <https://www.organisatiegids.universiteitleidennl/expertisecentra/veiligheid-gezondheid-en-milieu>
  - As noted in argument 4, there is always a chance of blood-to-blood contact.
  - Use fresh gloves for each subject and dispose of old gloves immediately after use.
  - For taking off gloves, hold the edge and strip it off in one movement. The glove will automatically go inside-out. Never take off the glove by pulling the fingers, so as to avoid contact with any infected surface.
  - Always wash your hands right after you take off the gloves.

- Blood contact can occur even when (red) blood is not visible.
- Check whether chemicals can damage gloves before using them.
- <https://www.organisatiegids.universiteitleiden.nl/expertisecentra/veiligheid-gezondheid-en-milieu>

- 2.4. The simplest act of disinfection is to wash your hands. This should happen (independent of the use of gloves):
- preceding physiological acts (**P**)
  - following physiological acts (**P**)
  - after going to the lavatory (**P**)
  - after sneezing, coughing or wiping your nose (use paper tissues!) (**R**)
  - after unforeseen contact with blood or other body fluids (**P**)
- \* Gloves can be damaged. Therefore, still wash your hands before and after you wear them.
- 2.5. Rings should preferably not be worn during research (**R**)
- \* They make it harder to wash the hands.
  - \* They increase the chance of damage to gloves.
- 2.6. Nails should be kept short during the period of research (**R**)
- \* to make and keep hands clean.
  - \* to avoid damage to gloves.

### 3. Equipment

- 3.1. Prepare the experiment as much as possible, so that a minimum of lockers, knobs, bottles and jars have to be touched during the physiological preparation (**R**).
- 3.2. If possible, make use of disposable materials and throw them away (after one-time use) in the proper containers (**P**). Consult SOLO Lab support (tel. 5693) for questions

a) Blue BI-waste container

Not part of the standard equipment. Necessary when disposable materials with increased risk of infection are used, such as materials containing blood or sperm. In case of doubt, contact SOLO Lab support (tel. 5693).

b) Needle container

Because needles have a high risk of infection, all used needles should be deposited in a special container. Needle containers can be ordered from SOLO. Store the containers in a safe place. Contact SOLO lab support if the container is full.

c) Black chemicals container

Disinfectant is collected in a black chemicals container. These containers are replaced once per three weeks.

d) Garbage cans

For garbage that does not require separate disposal.

- 3.3. Durable tools should be disinfected (if necessary sterilised) per subject. (**P**) (see Appendix B)

If instruments have been or will come in contact with the body without reaching the blood stream and without trespassing mucous membranes, there is a legal prescription to reach 'high-level disinfection'. This implies that all viruses, fungi and bacteria should be killed. If the blood stream is reached or a mucous membrane is trespassed, the prescription is to also kill bacterial traces, so that full sterility is reached. For high-level disinfection, we make use of Incidin Plus, with the active ingredient glucoprotamine. This substance is dissolved in water.

To-be-disinfected materials should be submerged in the solution during 15 minutes (based on a 2% solution).

- Durable needles cannot be disinfected with glucoprotamine. Use disposable needles instead.
- Collect to-be-disinfected materials on disposable paper. If you use a durable container to collect materials, this container should also be disinfected.
- Clean all material with lukewarm water and appropriate soap (e.g. Ivory) prior to disinfection. If you use brushes or reusable gloves, these should also be disinfected, or be used exclusively prior to disinfection.
- If full sterility is required, all steps that involve the use of water should be performed with distilled water.
- Never use reusable towels or other cloths in the disinfection procedure. These are excellent breeding grounds for bacteria.

3.4. If beds are used for the experiment:

- use cotton blankets. These can go into the laundry (per subject) at 90 °C, just as all other bedclothes.
- use clean bedclothes for each new subject (including blankets!)
- supply pillows and mattresses with a washable cover and clean this per subject.

3.5. Towels, washing-gloves, etc. that are provided for the subject should be cleaned per subject.

#### **4. Research units**

4.1. For physiological preparations/actions (attaching electrodes, extracting blood/saliva, centrifuging, disinfecting, pipetting, etc.) make maximum use of the general research unit that is meant for that purpose (R). In this way, all possible infections are restricted to one place that can be suitably cleaned.

4.2. In case certain preparation need to be performed in places other than those named under 4.1 (e.g. the experimental setup), these should be restricted to the subject-side of the unit. The researcher should keep the laboratory-coordinator informed about the kind of actions that are performed in that room and the precautions that other users (technical personnel, colleagues, etc.) should take (P).

4.3. Units where physiological preparations are performed cannot be used for the preparation of meals or the consumption of edibles.(P).

4.4. Units where physiological preparations take place should be cleaned on a daily basis (e.g. with a bleach solution). (P) This constitutes:

- wiping the floor
- wiping furniture and other horizontal surfaces with a wet cloth

4.5. Units where physiological activities take place should be checked daily as to whether:

- the paper towel role needs to be changed.
- the soap dispenser needs a refill.
- waste containers need to be emptied.

4.6. Units where physiological preparations are performed should have sufficient air conditioning.

4.7. Smoking is forbidden in the psychophysiological laboratory. (P)

- \* Research takes place in public locations, to which national prescriptions apply.
- \* Research involves volatile and other inflammable substances.
- \* Some subjects are non-smokers.

#### **5. Actions**

5.1. Invasive actions (such as extraction of blood) can only be performed by authorised personnel.

- 5.2. While working with organic substances or chemicals, the working surface should be covered with absorbent paper (**P**).
- 5.3. Each experimenter should inform him/herself **by consulting the manual** about the proper use, safety and cleaning prescriptions of equipment or substances prior to their use. (**P**)
- 5.4. While working with disinfectant, safety glasses should be used.

## 6. Laboratory facilities

6.1. Laboratories in the FSW (faculty of social sciences) building in which physiological actions are performed should possess a central room with the following specifications (**P**).

- All electrical wiring should be in secured electrical supply groups
- If chemical vapors are produced in the recording procedure, there should be a fume-cupboard with a separate ventilation channel
- If chemicals with risk for the eyes are used, there should be safety glasses present
- There should be a kitchen sink with taps for hot and cold water
- There should be a soap dispenser and a paper towel dispenser
- All dedicated waste containers (see 3.2) should be present
- There should be a first aid kit
- There should be a telephone with a list of emergency telephone numbers (see appendix D)
- The tap should have a flexible hose so that the eyes can be flushed in case of emergency
- The floor covering should be easy to clean
- If blood samples need to be stored, there should be a dedicated freezer
- If chemical substances need to be cooled there should be a dedicated refrigerator

6.2. Rooms in the FSW building in which physiological recordings take place should have the following characteristics (**P**):

- All electrical wiring should be in secured electrical supply groups
- There is a climate control system that is sufficient for the research requirements
- The recording chamber should be near a central room as described in 6.1
- The floor covering should be easy to clean

6.3. For research taking place outside the FSW building, there are no separate guidelines. Research taking place under the responsibility of FSW but outside the FSW building should follow the same rules. If this is not possible in the opted location, permission for the study should be obtained from the ethics committee of FSW. Research in the LUMC should comply with LUMC regulations.

## LITERATURE

1. Advies inzake herziene richtlijnen ter preventie en bestrijding van ziekenhuisinfecties. (Advise concerning revised guidelines for prevention and abatement of hospital infections) Min. van Volksgezondheid en Milieuhygiene, 's-Gravenhage (1977). (Ministry of Public Health and Environmental Hygiene in The Hague)
2. Recommendations for the prevention of HIV transmission in health-care settings. Centers for Disease Control (1987). *Morbidity and Mortality Weekly Report*, 36, (suppl 2S), Is-18s.
3. Update: Universal precautions for prevention of transmission of human immunodeficiency virus, hepatitis B virus, and other blood borne pathogens in health-care settings. Centres for Disease Control (1988). *Morbidity and Mortality Weekly Report*, 37, 377-388.
4. Extracts from "Electrode maintenance and infection control in the EEG laboratory" [A.M.Grass & E.R.Grass]. *In: Regan, D. Human brain electrophysiology*. New York: Elsevier (1989).
5. Information brochure CIDEV". Johnson & Johnson Medical BV
6. Admission decree CIDEXPI. Ministerie van Welzijn. Volksgezondheid en Cultuur (1991). (Ministry of Public Health and Culture)
7. Putnam, L.E., Johnson, R.Jr. & Roth, W.T. (1992) *Guidelines for reducing the risk of disease transmission in the psychophysiology laboratory*. (SPR ad hoc committee report).
8. Huth, S., Yo, Z-J., Yu, T., & Crawford, L. (2000). Factors to consider when selecting a high-level disinfectant. <http://www.metrex.com/TechInfo/FactorsToConsider.pdf>

## APPENDIX A.

### WORKING SAFELY WITH CHEMICAL SUBSTANCES

The term 'Chemical substances' applies to all substances that are used during physiological research: alcohol, acetone, electrode paste, disinfectant, collodion, etc.

1. Ensure that labels on all bottles, jars, cups, etc. are clear and accurate.
2. Always check the label of a substance before use, mainly to make sure that the right substance is being used, but also find out whether any precautions have to be taken (when in doubt, read the manual)
3. Bottles, jars, cups and boxes should be kept closed as much as possible, for both economical and health care reasons, and to avoid vapors in the eyes (which is most unwelcome, e.g. in visual tasks).
4. Never smell bottles directly, but rather wave some of the odor towards the nose.
5. Always care for good ventilation.
6. Never use a bottle or jar for substances other than those indicated on the label.
7. When a substance touches the skin immediately flush it off with lots of water for safety.
8. When a substance comes into eyes, immediately flush it out with lots of water. Never rub! Bend the plastic hose on the faucet upward and use it as a shower for the eyes. Always use cold water and arrange the flow with the free hand. Flush each eye in turn and pause after some time to avoid hypothermia of the eye. Notify a doctor if necessary (LUMC First Aid: (0)5262025 / (0)5262320)
9. In case of poisoning, contact:
  - \* LUMC First Aid: (0)5262025 / (0)5262320
  - \* National intoxication centre: (0)030-2748888
10. Never smoke in rooms where chemical substances are used and be careful with open fire. Most substances that are used in psychophysiological research are (highly) inflammable.
11. Never flush chemicals down the drain. Instead, store them in the particular refuse container for the particular (class of) substances (see 3.2). The color of the container indicates which class of substances can safely be disposed in it. Information about the color coding can be asked for at the university Arbo- and Environmental services. To order a container, contact Jan de Koning (room 0A13, tel 3615) or Paul Barnhorn (Gorlaeus, room 46, tel. 4609). Store the container in a safe place. To have full containers replaced outside the regular schedule, ask Kerwin Olfers (tel. 3803)
12. Always transport chemicals in a well closed container, provided with a clear label.



## APPENDIX B

### USER MANUAL FOR Incidin PLUS

1. Always wear safety glasses, safety gloves and an apron or lab-coat when using Incidin PLUS. Incidin PLUS is corrosive and can damage skin, eyes and clothes. (H332, H314, H400, R22, R20, R34, R50)
2. Dilute Incidin PLUS to 2% (1 part Incidin PLUS with 49 parts cold water) to prepare a disinfection liquid. Preparing a total of 500 ml daily usually suffices.
3. Replace the disinfection liquid in the round container every day. Try to keep the container with disinfection liquid closed.
4. Every new stock dilution of Incidin PLUS is stored in the black jerry can. Use 80 ml of undiluted Incidin and 4 liters of cold water. A new dilution can be used up to 21 days after preparation. Write the last date that the new solution can be used on the label.
5. Make sure that all materials in need of disinfection are being rinsed first to remove the gel.
6. All parts that might have been in contact with blood, sperm, excrement, or other body fluids need to be submerged in the disinfection liquid for 1 hour. This does not apply to EEG electrodes (see point 8).
7. Incidin PLUS is suitable for 'Electrocaps', syringes and electrodes. For all other materials please make sure that Incidin PLUS is a suitable disinfectant.
8. Do not leave any material submerged in the disinfection liquid longer than appropriate as this can corrode the materials. When diluted to 2%, the incubation time is 15 minutes.
9. Diluted 2% solutions can be disposed of through the normal water drain system (i.e. sink). Make sure to rinse with water thoroughly afterwards.
10. Rinse all materials that have been disinfected with Incidin PLUS thoroughly with streaming water before they can make contact with the skin.
11. This disinfection method is appropriate against infection with HIV and Hepatitis-B.
12. Make sure that Incidin PLUS, the diluted disinfection liquid and the disinfection bath are always stored in a closed container.
13. The efficacious ingredient in Incidin PLUS is GLUCOPROTAMINE (25% - 30%)
14. Incidin PLUS is in accordance with DGHM and DVV
15. Treatment of electrocaps after each measurement:
16. Remove the Velcro straps (sticky cloth). These do not need to be disinfected.
17. Remove the electrodes.
18. First remove all remaining gel thoroughly with cotton tips and a soft toothbrush under running water. Ivory soap is appropriate in this stage.
19. Use Incidin diluted liquid for 15 minutes to disinfect the cap, the electrodes, and syringe.
20. Always thoroughly rinse with water afterwards to prevent skin irritation.
21. When necessary use the hair-dryer to speed-dry the materials. Make sure the temperature of the materials does not exceed 40 degrees C.
22. Risks: serious burn wounds and eye-damage (H314), harmful when inhaled (H332), very toxic to organisms in water (H400).
23. First aid measures for exposure to Incidin:
  - In case of any complaints or symptom's consult a doctor.
  - If fumes are inhaled, seek fresh air. In case of lingering complaint/symptoms, consult a doctor.
  - In case of direct contact with skin: immediately rinse with water (15 minutes). Take off contaminated clothing. Consult a doctor. (P303, P361, P353)

- In case of contact with eyes: immediately rinse excessively with water (at least 15 minutes), including under the eyelids. Remove eye contacts if possible. Use the eye-washer on the wall (E). Consult a doctor and/or intoxication centre immediately. (P305, P351, P338)
- If swallowed: rinse mouth with water (NOT milk), do NOT induce vomiting, medical treatment needed immediately. (P310)
- National intoxication center (0) 030-2748888 and 3701
- First Aid via reception FSW 3701
- For external numbers called from a university phone: start with 0 For local numbers called with a cell phone: start with 071-527....
- Import of Incidin Plus for The Netherlands:
- Ecolab BV, Iepenhoeve 7a+7b, 3438 MR, MN Nieuwegein, tel: 030-6082222
- NLCustomerServices@Ecolab.com
- Ecolab emergency phone number: +31852085762

## **APPENDIX C**

### **WASHING AND CARING FOR YOUR HANDS**

1. Preferably, use warm water.
2. Bring wet hands in proper contact with soap from the dispenser.
3. Rinse hands with lots of water.
4. Dry wet hands with paper disposable towels.  
\* It is important to have dry hands, for they contain less bacteria.
5. Close the tap with the same paper towel.
6. Regularly treat hands with cream.  
\* By washing hands regularly, chaps may arise. In these chaps, micro-organisms can settle that are hard to wash out.
7. Keep nails clean and short. If necessary, use a nail brush in addition to washing hands.

Note Normal liquid soap can be used, preferably “Unicura”. Use of additional disinfectants for hands is not necessary.

## APPENDIX D

### IMPORTANT TELEPHONE NUMBERS

Alarm in case of life-threatening situations (our local FSW first aid will help and call other services)	3701
Alarm, other calamities FSW	3701
National intoxication center	(0) 030-2748888 and 3701
First Aid via reception FSW	3701
In case of prick incidents	(0) 071-5263643
In case of prick incidents outside office hours	(0) 071-5299418
Reception FSW	3600
Disposal of chemical garbage	3198
Internal Arbo- and Environmental Services UL	3198
Safety and Environment UL	3198
Ecolab (import of Incidin plus)	(0) 030-6082222
ICT Helpdesk	8888
SOLO (physiology technicians)	5693
Kerwin Olfers (EEG lab coördinator)	3803
For external numbers called from a university phone: start with	0
For local numbers called with a cell phone: start with	071-527....