UNIVERSITY OF WASHINGTON LAB MANAGED ANIMAL CARE AND RECORDS: OCTOPUS

CREATED BY

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PRESENTED BY

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OR

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PURPOSE OF TRAINING

- STANDARDIZATION OF ANIMAL HUSBANDRY AND CARE CAMPUS WIDE.
- IMPROVEMENT OF COMMUNICATION WITH DECENTRALIZED PERSONNEL.
- THE GUIDE FOR THE CARE AND USE OF LABORATORY ANIMALS (2011)

REQUIREMENTS

- THE PRINCIPAL INVESTIGATOR (PI), FACILITY MANAGER, AND ALL PERSONNEL PROVIDING CARE FOR ANIMALS IN A LAB MANAGED FACILITY MUST BE TRAINED AND TRAINING MUST BE DOCUMENTED.

- EACH LAB MANAGED FACILITY MUST HAVE A RESPONSIBLE POINT-PERSON FOR LOCAL OVERSIGHT AND COMMUNICATION WITH VETERINARY STAFF.

REGULATIONS ON CEPHALOPOD CARE AND USE

- CANADA — CCAC, 1991
- NEW ZEALAND — ANIMAL WELFARE ACT, 1999
- AUSTRALIA — THE CODE, 2004
- SWITZERLAND — TIERSCHUTZVERORDNUNG, 2008
- NORWAY — ANIMAL WELFARE ACT, 2010
- EUROPEAN UNION — DIRECTIVE 2010/63/EU, 2013
  - UK: *OCTOPUS VULGARIS* PROTECTED SINCE 1993
  - GERMANY: CEPHALOPOD AND DECAPOD PROTECTION
- USA NO FEDERAL REGULATION

Smith et al., 2013

Slide from Emily Northrup , DVM, PhD – 70th National AALAS 2019

OCTOPUS CARE RESOURCES/REFERENCES

- COOKE GM, ANDERSON DB, BEGOUT ML, DENNISON N, OSORIO D, TONKINS B, KRISTIANSEN T, FIORITO G, GALLIGIONI V, PONTE G, ANDREWS PL. (2019) PROSPECTIVE SEVERITY CLASSIFICATION OF SCIENTIFIC PROCEDURES IN CEPHALOPODS: REPORT OF A COST FA1301 WORKING GROUP SURVEY. LAB ANIM
- FIORITO G, AFFUSO A, ANDERSON D, BASIL J, ET AL. (2014) CEPHALOPODS IN NEUROSCIENCE: REGULATIONS, RESEARCH AND THE 3RS. *INVERT. NEUROSCI.* 14, 13-36
- FIORITO G, AFFUSO A, BASIL J, COLE A, DE GIROLAMO P, D'ANGELO L, ET AL. (2015). GUIDELINES FOR THE CARE AND WELFARE OF CEPHALOPODS IN RESEARCH - A CONSENSUS BASED ON AN INITIATIVE BY CEPHRES, FELASA AND THE BOYD GROUP. *LAB. ANIM.* 49, 1–90.
- HARVEY-CLARK, C. IACUC CHALLENGES IN INVERTEBRATE RESEARCH. (2011) *ILAR J* 52, 213–220
- MOLTSCHANIWSKYJ NA, HALL K, LIPINSKI MR, MARIAN JEAR, NISHIGUCHI M, SAKAI M, ET AL.(2007) ETHICAL AND WELFARE CONSIDERATIONS WHEN USING CEPHALOPODS AS EXPERIMENTAL ANIMALS. REV FISH BIOL FISH 17:455–476
- O'BRIEN, C. E., ROUMBEDAKIS, K. & WINKELMANN, I. E. THE CURRENT STATE OF CEPHALOPOD SCIENCE AND PERSPECTIVES ON THE MOST CRITICAL CHALLENGES AHEAD FROM THREE EARLY-CAREER RESEARCHERS. (2018) *FRONT PHYSIOL* **9**, 700
- PONTE, G., ANDREWS, P., GALLIGIONI, V., PEREIRA, J., & FIORITO, G. (2019) CEPHALOPOD WELFARE, BIOLOGICAL AND REGULATORY ASPECTS: AN EU EXPERIENCE. IN THE WELFARE OF INVERTEBRATE ANIMALS (PP. 209-228). SPRINGER, CHAM.
- ANDREWS PLR, DARMAILLACQ A-N, DENNISON N, GLEADALL IG, HAWKINS P, MESSENGER JB, OSORIO D, SMITH VJ, SMITH JM (2013) THE IDENTIFICATION AND MANAGEMENT OF PAIN, SUFFERING AND DISTRESS IN CEPHALOPODS, INCLUDING ANAESTHESIA, ANALGESIA AND HUMANE KILLING. J EXP MAR BIOL ECOL 447:46–64.
- SMITH JA, ANDREWS PLR, HAWKINS P, LOUHIMIES S, PONTE G, DICKEL L (2013) CEPHALOPOD RESEARCH AND EU DIRECTIVE 2010/63/EU: REQUIREMENTS, IMPACTS AND ETHICAL REVIEW. J EXP MAR BIOL ECOL 447:31–45

STANDARD OPERATING PROCEDURES (SOPS)

EACH FACILITY SHOULD MAINTAIN SOPS ON:

- ANIMAL HUSBANDRY AND CARE PROCEDURES AND SCHEDULES
- SICK ANIMAL RECOGNITION, REPORTING TO VETERINARY SERVICES, AND EUTHANASIA
- VERMIN MONITORING AND CONTROL
- ANIMAL CARCASS DISPOSAL
- PHYSICAL PLANT EMERGENCY PROCEDURES AND CONTACTS

SOP'S SHOULD BE:

- DATED UPON CREATION AND RE-DATED FOR EACH SUBSEQUENT MODIFICATION
- REVIEWED AND UPDATED REGULARLY
- KEPT IN AN EASILY ACCESSIBLE AREA IN THE ANIMAL FACILITY, IN AN ORGANIZED FASHION (I.E., PLACED IN A BINDER OR POSTED)

OCCUPATIONAL HEALTH PROGRAM

- THE OCCUPATIONAL HEALTH PROGRAM FOR ANIMAL CARE AND USE HAS TWO COMPONENTS:
  - **THE ANIMAL USE MEDICAL SCREENING FORM (AUMS)**
    - COMPLETION OF THE AUMS FORM MUST OCCUR:
      (1) PRIOR TO WORK IN THE ANIMAL CARE AND USE ENVIRONMENT
      (2) EVERY THREE YEARS THEREAFTER
      (3) WHEN A CHANGE IN HEALTH STATUS HAS OCCURRED, AND
      (4) AS OTHERWISE DIRECTED BY THE OHN
    - RECOMMENDATIONS ARE BASED ON AN INDIVIDUAL'S OWN HEALTH HISTORY/ISSUES.
  - **OCCUPATIONAL HEALTH PROTOCOL RECOMMENDATIONS (OHR'S)**
    - COVERS SPECIES SPECIFIC ZOONOTIC DISEASE INFORMATION, IMMUNIZATIONS, AND MEASURES TO REDUCE RISKS TO PERSONNEL.

Forms are available on the web:
https://www.ehs.washington.edu/research-lab/animal-use-medical-screening-aums

PERSONAL PROTECTIVE EQUIPMENT (PPE)



http://www.wsha.org/files/82/HandWash.PNG

- Dedicated outer garment(s).
  - Cleaned on-site
- Gloves (non-powdered).
- Adequate and frequent hand washing.
- Closed toe shoes

ANIMAL I.D. REQUIREMENTS

ROOM/ANIMAL TANK I.D. : THE FOLLOWING MINIMUM INFORMATION MUST EITHER BE DOCUMENTED VIA A TANK CARD ON EACH TANK OR POSTED ON THE INTERIOR OF THE ANIMAL ROOM DOOR.

- Principal Investigator (PI)
- Contact phone number(s)
- Species
- Date of birth or receipt
- Budget number
- IACUC protocol number

ROOM REQUIREMENTS: EXPERIMENTAL PROCEDURES

- THE APPROVED IACUC PROTOCOL, DESCRIBING PROCEDURES TO BE CONDUCTED, MUST BE IN THE FACILITY OR IN THE ROOM WHERE PROCEDURES WILL BE PERFORMED.
- IF YOU HAVE WRITTEN SEPARATE EXPERIMENTAL SOPS, MAKE CERTAIN THAT THEY MATCH THE PROCEDURES THAT ARE APPROVED IN THE IACUC PROTOCOL.

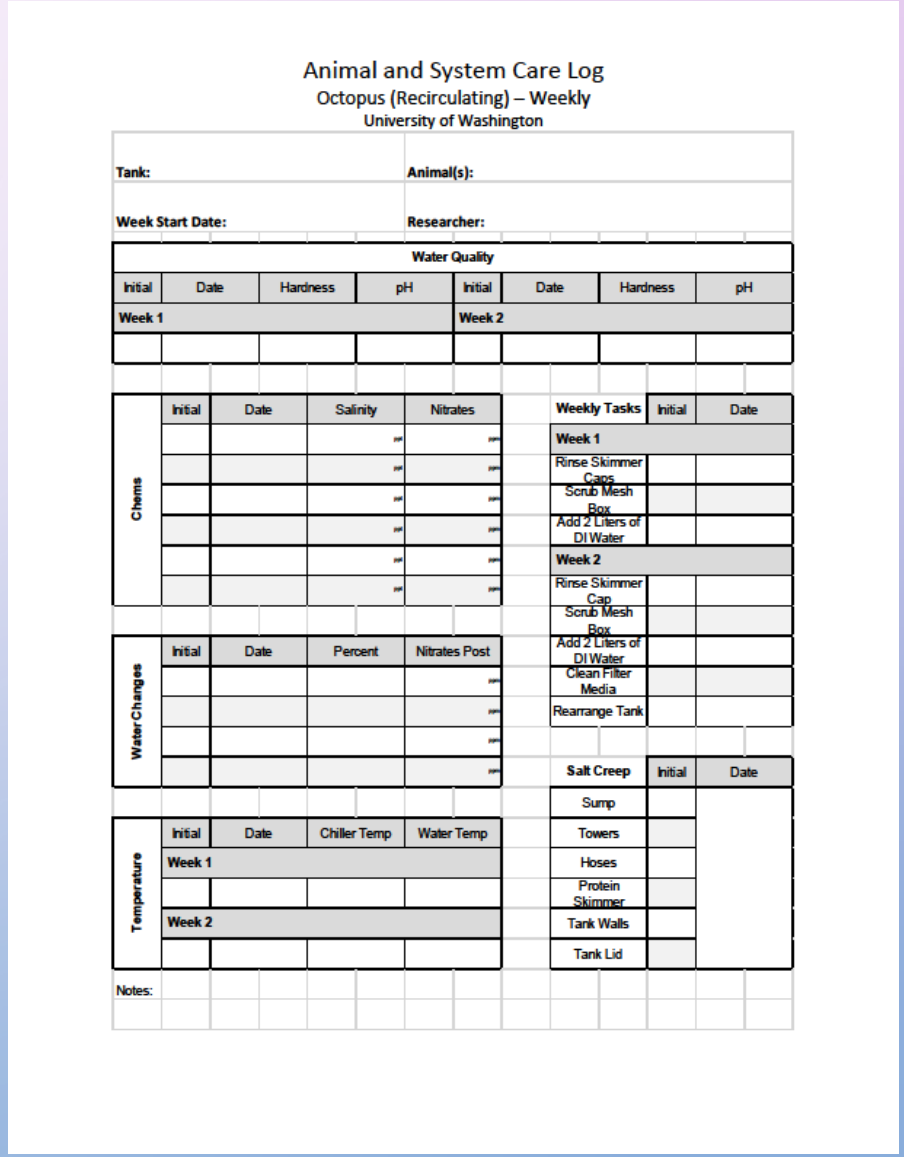
ENVIRONMENTAL PARAMETERS

- OCTOPUS: WHEN ANIMALS ARE PRESENT, CONFIRM WATER CIRCULATION & SYSTEM FUNCTION[1], MEASURE WATER TEMPERATURE[1], PH[2], SALINITY[2], NITRATE[2], HARDNESS[2].
  - [1] MEASURE AND RECORD DAILY
  - [2] MEASURE AND RECORD AT LEAST WEEKLY
- ACTION MUST BE TAKEN WHEN PARAMETERS ARE OUT OF THE NORMAL RANGE! ACCEPTABLE RANGES MUST BE PART OF THE HUSBANDRY AND CARE SOP AND BE POSTED IN THE ANIMAL HOUSING AREA.
  - CONTACT: PHYSICAL PLANT, CONSULT FACILITY MANAGER OR LAB MANAGED FACILITY PROGRAM COORDINATOR.

ROOM REQUIREMENTS: ROOM/ANIMAL CARE LOG

CHECKLIST ON THE LOG MUST BE COMPLETED DAILY/ WEEKLY.

- USE OF STANDARDIZED FORMS IS REQUIRED.
- LOGS MUST BE KEPT WELL ORGANIZED. PER UW RETENTION REQUIREMENTS, LOGS MUST BE MAINTAINED FOR 6 YEARS.
- REMEMBER TO FOLLOW LISTED FREQUENCY REQUIREMENTS (*E.G., SCHEDULED WATER CHANGES OR COMPONENT CLEANING*).



Animal and System Care Log
Octopus (Recirculating) – Weekly
University of Washington

Tank: **Animal(s):**

Week Start Date: **Researcher:**

Water Quality

Initial	Date	Hardness	pH	Initial	Date	Hardness	pH
Week 1				**Week 2**			

Chems

Initial	Date	Salinity	Nitrates
		ppt	ppm
		ppt	ppm
		ppt	ppm
		ppt	ppm
		ppt	ppm
		ppt	ppm

Water Changes

Initial	Date	Percent	Nitrates Post
			ppm
			ppm
			ppm
			ppm

Temperature

Initial	Date	Chiller Temp	Water Temp
Week 1			
Week 2			

Weekly Tasks	Initial	Date
Week 1		
Rinse Skimmer Caps		
Scrub Mesh Box		
Add 2 Liters of DI Water		
Week 2		
Rinse Skimmer Cap		
Scrub Mesh Box		
Add 2 Liters of DI Water		
Clean Filter Media		
Rearrange Tank		

Salt Creep	Initial	Date
Sump		
Towers		
Hoses		
Protein Skimmer		
Tank Walls		
Tank Lid		

Notes:

ROOM REQUIREMENTS: DEAD ANIMAL LOG

RECORD ALL ANIMAL DEATHS ON A DEAD ANIMAL LOG SHEET.

- THIS WILL ASSIST IN INVESTIGATION OF DISEASE OUTBREAKS AND OTHER ANIMAL HEALTH RELATED ISSUES.
- LOGS MUST BE KEPT WELL ORGANIZED. PER UW RETENTION REQUIREMENTS, LOGS MUST BE MAINTAINED FOR 6 YEARS.

DEAD ANIMAL LOG

Room # _____

Species _____

CALL **VETERINARY SERVICES** at 206-543-6257

for sick animals, health concerns or related problems

For emergencies, page the Veterinarian at 206-583-1853

DATE	PI	LOCATION	ID/Ear Tag #	*SURGERY / EXP	FOUND BY *(PRINT NAME)*	COMMENTS

(Return to Veterinary Services when complete)

* Did the animal have SURGERY or was it used in an EXPERIMENT? (YES OR NO)

MONTHLY POPULATION, MORBIDITY, AND MORTALITY REPORT

THE FOLLOWING INFORMATION MUST BE REPORTED TO VETERINARY SERVICES (DAVID CARSON) VIA E-MAIL (VSREPORT@UW.EDU) ON A MONTHLY BASIS:

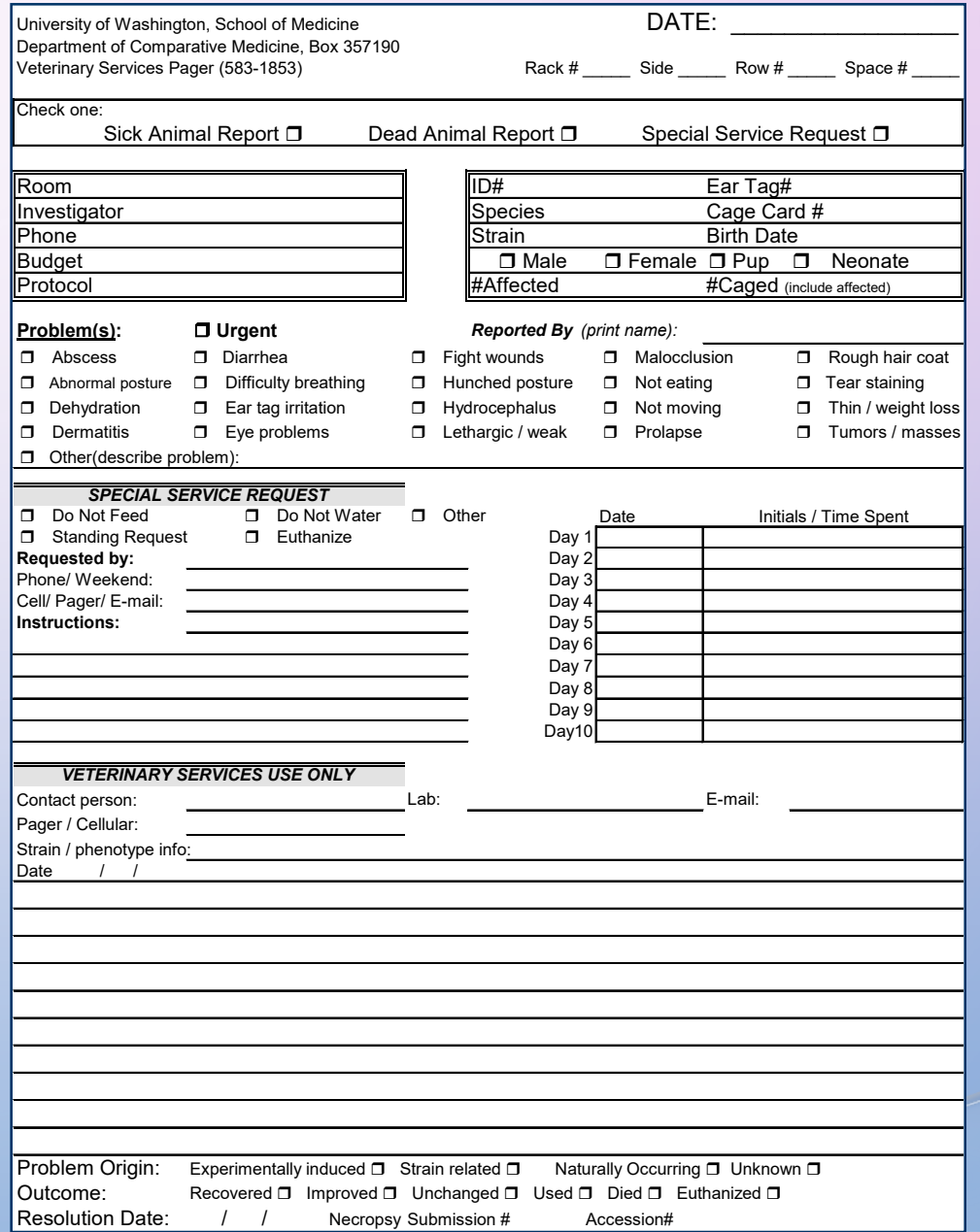
- PROTOCOL #:
- CONTACT & PHONE #:
- BUILDING/ROOM #(S):
- PI:
- SPECIES:
- TOTAL # OF ANIMALS HELD (LIST MULTIPLE SPECIES SEPARATELY):
- # OF NEW ANIMALS ACQUIRED AND SOURCE:
- # OF DEATHS:
- POSSIBLE CAUSE OF DEATH(S):

WHAT MORTALITY REQUIRES REPORTING?

- ANIMALS THAT ARE FOUND DEAD IN TANKS OR ENCLOSURES.
- ANIMALS THAT DIE DURING OR AFTER PROCEDURES HAVE BEEN PERFORMED ON THEM (EVEN IF YOU EUTHANIZE THE ANIMAL DUE TO POOR RECOVERY).
- **DOES NOT** INCLUDE ANIMALS EUTHANIZED FOR EXPERIMENTAL PURPOSES.

SICK ANIMAL REPORTING

- ALL SICK ANIMALS MUST BE REPORTED IMMEDIATELY TO VETERINARY SERVICES.
- REFER TO THE VETERINARY CONTACT SHEET POSTED IN YOUR ROOM.
- ALWAYS MARK THE CAGE WITH A "VET CHECK" CARD.
- FOR ANIMAL RELATED EMERGENCIES OR AFTER HOURS, CONTACT THE DUTY VETERINARIAN, (206) 583-1853.
- HTTPS://WWW.WASHINGTON.EDU/COMPMED/UW-VETERINARY-SERVICES/UW-VETERINARY-SERVICES-SICK-ANIMAL-REPORTING/



University of Washington, School of Medicine
Department of Comparative Medicine, Box 357190
Veterinary Services Pager (583-1853)

DATE: _____

Rack # _____ Side _____ Row # _____ Space # _____

Check one:
Sick Animal Report ❒ Dead Animal Report ❒ Special Service Request ❒

Room	
Investigator	
Phone	
Budget	
Protocol	

ID#	Ear Tag#
Species	Cage Card #
Strain	Birth Date
❒ Male ❒ Female ❒ Pup ❒ Neonate	
#Affected	#Caged (include affected)

Problem(s): ❒ **Urgent** *Reported By (print name):* _____

❒ Abscess ❒ Diarrhea ❒ Fight wounds ❒ Malocclusion ❒ Rough hair coat
❒ Abnormal posture ❒ Difficulty breathing ❒ Hunched posture ❒ Not eating ❒ Tear staining
❒ Dehydration ❒ Ear tag irritation ❒ Hydrocephalus ❒ Not moving ❒ Thin / weight loss
❒ Dermatitis ❒ Eye problems ❒ Lethargic / weak ❒ Prolapse ❒ Tumors / masses
❒ Other(describe problem):

SPECIAL SERVICE REQUEST

❒ Do Not Feed ❒ Do Not Water ❒ Other
❒ Standing Request ❒ Euthanize

Requested by: _____
Phone/ Weekend: _____
Cell/ Pager/ E-mail: _____
Instructions: _____

	Date	Initials / Time Spent
Day 1		
Day 2		
Day 3		
Day 4		
Day 5		
Day 6		
Day 7		
Day 8		
Day 9		
Day10		

VETERINARY SERVICES USE ONLY

Contact person: _____ Lab: _____ E-mail: _____
Pager / Cellular: _____
Strain / phenotype info: _____
Date / /

Problem Origin: Experimentally induced ❒ Strain related ❒ Naturally Occurring ❒ Unknown ❒
Outcome: Recovered ❒ Improved ❒ Unchanged ❒ Used ❒ Died ❒ Euthanized ❒
Resolution Date: / / Necropsy Submission # Accession#

VETERINARY SERVICES CONTACT INFO

Post Veterinary Services Contact Information. This will provide easy access to contact numbers for veterinary assistance.

- VETERINARY SERVICES OFFICE:

  PHONE: (206) 543-6257

  FAX: (206) 685-9433

  EMAIL: VS6FLOOR@UW.EDU
- DUTY VETERINARIAN (FOR EMERGENCIES OR AFTER HOURS):

  PAGER: (206) 583-1853

ROOM REQUIREMENTS:
PI GROUP EMERGENCY/WEEKEND CONTACT INFO

POST EMERGENCY/WEEKEND CONTACT INFORMATION FOR THE INVESTIGATIVE GROUP.

- MUST INCLUDE HOME PHONE NUMBERS, PAGER NUMBERS, CELL PHONE NUMBERS, ETC.
  - THIS INFORMATION WILL ASSIST IN THE CARE OR TREATMENT OF RESEARCH ANIMALS IN TIMES OF EMERGENCY.
  - THIS INFORMATION MUST REMAIN CURRENT AND MUST BE UPDATED REGULARLY.

NOTE: Veterinary/Oversight access to animals is required 24 hrs., 7 days/wk.

REMOTE MONITORING OF FACILITIES BY SENSAPHONE®

- APPROPRIATE ENVIRONMENTAL PARAMETERS FROM EACH FACILITY WILL BE REMOTELY MONITORED.
- ALARM NOTIFICATION WILL BE SENT OUT TO PHONE LIST AUTOMATICALLY WHEN PARAMETERS ARE OUTSIDE OF SET RANGE.
- CONTACT A LAB MANAGED FACILITY PROGRAM COORDINATOR

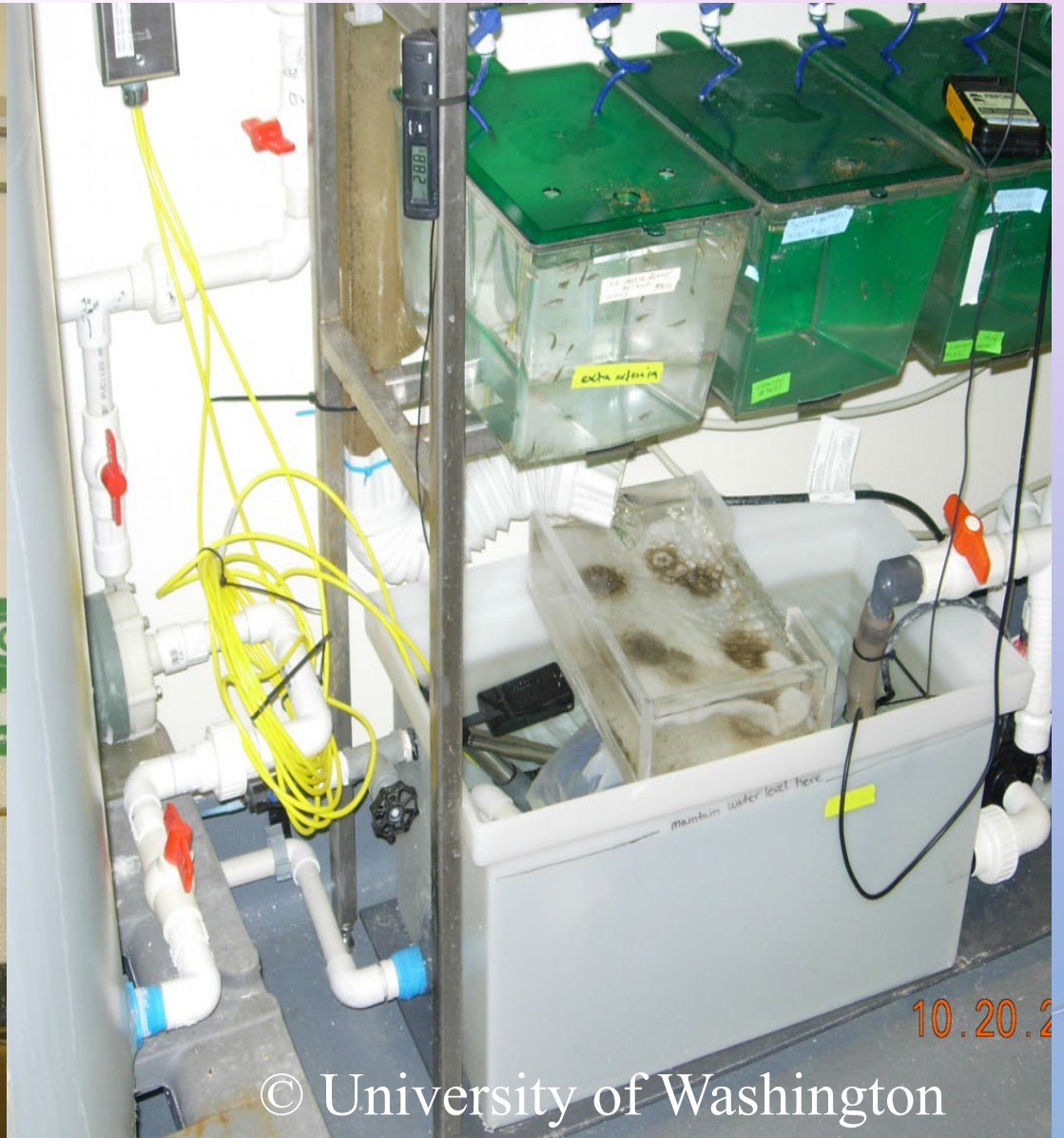
  OFFICE OF ANIMAL WELFARE: 206-685-7363

  TO:
  - OBTAIN INFORMATION ABOUT HOW THIS SYSTEM FUNCTIONS
  - HELP DEVELOP YOUR EMERGENCY CONTACT PROCEDURES

ELECTRONIC METERS CONNECTED TO REMOTE MONITORING DEVICES



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SENSAPHONES

- UNEXPECTED EVENTS HAPPEN. A SENSAPHONE IS A REMOTE MONITORING SYSTEM WHICH WILL NOTIFY YOU VIA TELEPHONE OF WATER QUALITY PARAMETERS THAT COULD HARM ANIMALS, SO YOU CAN RESPOND QUICKLY.
- PROBES SHOULD BE PROPERLY MAINTAINED AND CALIBRATED AS PER MANUFACTURER'S RECOMMENDATIONS.

SENSAPHONES

- EACH SENSAPHONE IS PROGRAMMED WITH SET WATER QUALITY PARAMETER RANGES AND IS CONNECTED TO SENSORS IN YOUR HOUSING ROOM OR ENCLOSURE. WHEN THE WATER QUALITY PARAMETERS GO OUT OF RANGE THE SENSAPHONE WILL BEGIN TO CALL THE FIRST PERSON ON THE ALARM CALL OUT LIST AND THEN CONTINUE DOWN THE LIST UNTIL THE CALL IS ACKNOWLEDGED BY THE CODE 555. THE ACKNOWLEDGEMENT CODE CANNOT BE ENTERED UNTIL AFTER THE THIRD VOICE ALARM MESSAGE. THE SENSAPHONE WILL ALARM EVERY 30 MINUTES IF THE WATER QUALITY PARAMETERS ARE STILL OUT OF RANGE.

SENSAPHONES CONT.

- THE CONTACTS AND PHONE NUMBERS ON THE ALARM CALL OUT LIST MUST REMAIN CURRENT AT ALL TIMES AND THE INDIVIDUALS MUST HAVE 24 HOUR BUILDING AND HOUSING ROOM ACCESS.
- TO MAKE CHANGES TO THE ALARM CALL OUT LIST, CONTACT THE OAW SENSAPHONE TECHNICIAN, PENDING HIRE?

UW – OFFICE OF ANIMAL WELFARE

(206) 685-7363

OAWRSS@UW.EDU

SENSAPHONES – ACKNOWLEDGING A CALL

- ALL UW SENSAPHONES ARE TESTED BY OAW TWICE A YEAR AND YOU WILL BE NOTIFIED PRIOR TO TESTING. ALL LAB-PROGRAMMED SENSAPHONES MUST ALSO BE TESTED BY LAB PERSONNEL AND DOCUMENTED EVERY 6 MONTHS.

- WHEN YOU ACKNOWLEDGE AN ALARM CALL, THE NEXT STEP IS TO CALL THE EMERGENCY NUMBERS FOR YOUR BUILDING AND FOLLOW THE EMERGENCY CALL OUT INSTRUCTIONS POSTED IN YOUR HOUSING ROOM.

ORDERING, RECEIVING, AND TRANSFERRING OCTOPUS

- ALL ANIMAL ORDERS AND TRANSFERS MUST BE DONE THROUGH THE ANIMAL OPERATIONS SYSTEM (**AOPS**).
  - HTTP://AOPS.WASHINGTON.EDU
- ENSURE THAT THE NUMBER OF ANIMALS USED DOES NOT EXCEED THE NUMBER APPROVED BY THE IACUC.
- THIS INCLUDES SPECIES THAT ARE NOT TRADITIONALLY "PURCHASED", AS WELL AS THOSE TRANSFERRED BETWEEN UW IACUC PROTOCOLS, OR RECEIVED FROM OUTSIDE THE UW.

ORDERING/TRANSFERRING OCTOPUS

- FOR AQUATIC ANIMALS THAT NEED TO BE ORDERED:
  - LOG INTO THE AOPS WEBSITE: HTTP://AOPS.WASHINGTON.EDU
  - CLICK INTO THE PROTOCOL YOU DESIRE TO ORDER ANIMALS FROM.
  - LEFT SIDE OF THE SCREEN, USE THE **"ORDER ANIMALS"** OR **"TRANSFER/EXPORT".**
  - FOLLOW THE SCREENS AND INPUT INFORMATION AS REQUESTED. FOR THE HOUSING LOCATION, YOU SHOULD HAVE YOUR FACILITY LISTED AS AN APPROVED HOUSING LOCATION. THE REQUESTED DELIVERY DATE SHOULD BE THE CURRENT DATE, AS NO BACK DATING CAN TAKE PLACE. **FOR THE VENDOR, PLEASE CHOOSE FROM APPROVED VENDOR, NON-APPROVED VENDOR, OR ANIMAL IMPORT**
  - *WHEN YOU CLICK "SUBMIT" FROM THE REQUISITION WORKSPACE WHICH IS AFTER YOU CLICK "FINISH"*, PLEASE USE THE COMMENTS SECTION TO NOTE SPECIFIC INFORMATION AS ONLY NECESSARY TO CLARIFY THE ORDER.
  - YOUR ORDER WILL BE PROCESSED ACCORDINGLY. PLEASE MAKE NOTE OF THE AOT NUMBER ON THE ORDER REQUISITION WORKSPACE. THIS IS YOUR ORDER REQUISITION NUMBER.

HTTPS://WWW.WASHINGTON.EDU/COMPMED/BILLING-AND-FINANCES/ANIMAL-PURCHASING/AQUATIC-ANIMALS/

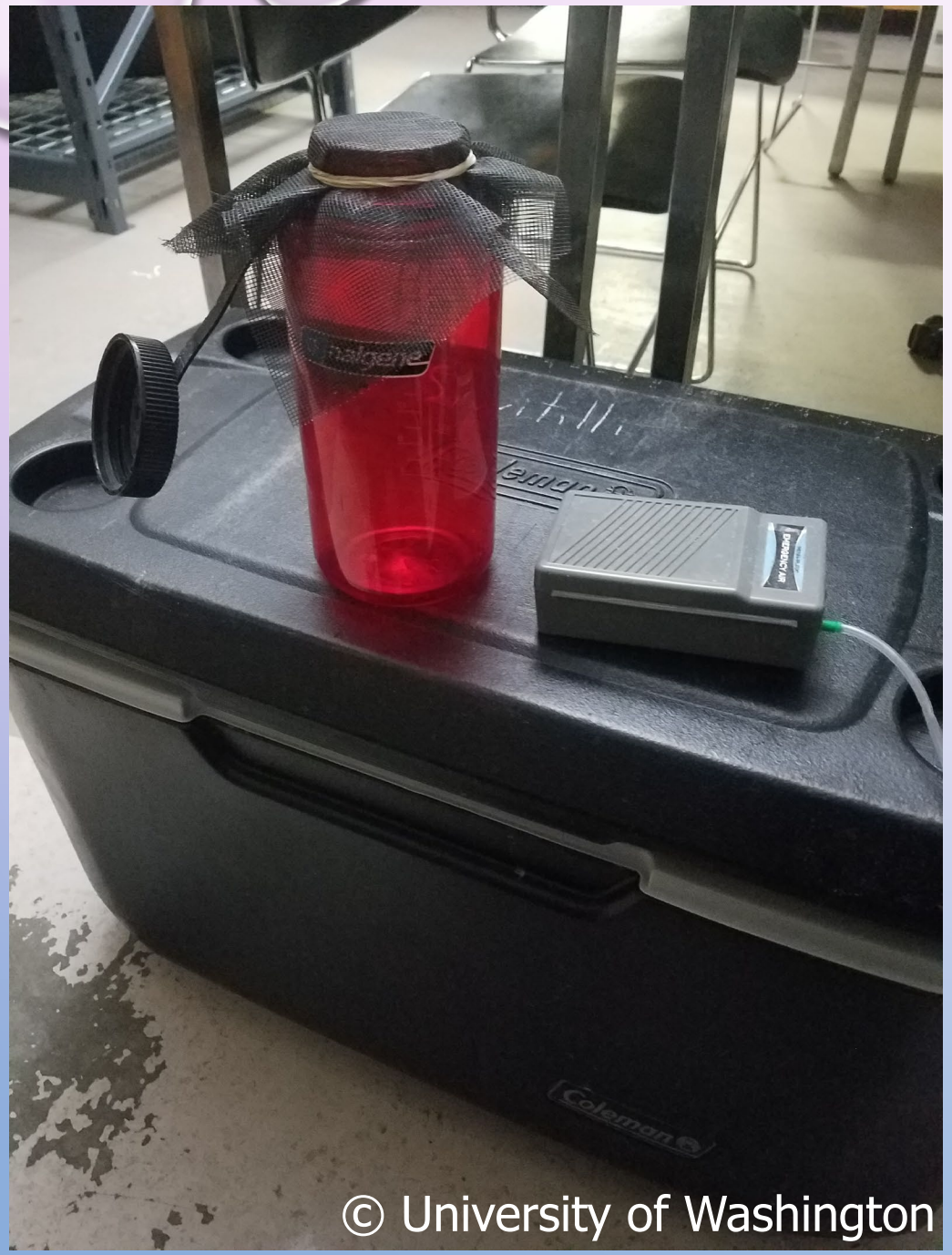
DEBITING OCTOPUS NUMBERS

- FOR AQUATIC ANIMALS THAT NEED TO BE ORDERED:
  - LOG INTO THE AOPS WEBSITE: HTTP://AOPS.WASHINGTON.EDU
  - CLICK INTO THE PROTOCOL YOU DESIRE TO ORDER ANIMALS FROM.
  - LEFT SIDE OF THE SCREEN, USE **"ORDER ANIMALS"** BUTTON.
  - FOLLOW THE SCREENS AND INPUT INFORMATION AS REQUESTED. FOR THE HOUSING LOCATION, YOU SHOULD HAVE YOUR FACILITY LISTED AS AN APPROVED HOUSING LOCATION. THE REQUESTED DELIVERY DATE SHOULD BE THE CURRENT DATE, AS NO BACK DATING CAN TAKE PLACE. **FOR THE VENDOR, PLEASE CHOOSE FROM APPROVED VENDOR LIST. IF A NON-APPROVED VENDOR OR ANIMAL IMPORT** HAVE SENDING INSTITUTION READY TO ENTER AS THIS IS NOW A REQUIRED FIELD ON THIS ONLINE FORM.
  - *WHEN YOU CLICK "SUBMIT" FROM THE REQUISITION WORKSPACE (THIS IS AFTER YOU CLICK "FINISH")*, PLEASE USE THE COMMENTS SECTION TO NOTE THE FOLLOWING STATEMENT: **"DO NOT ORDER ANIMALS. DEBIT NUMBERS ON PROTOCOL ONLY"**
  - YOUR ORDER WILL BE PROCESSED ACCORDINGLY. PLEASE MAKE NOTE OF THE AOT NUMBER ON THE ORDER REQUISITION WORKSPACE. THIS IS YOUR ORDER REQUISITION NUMBER.

HTTPS://WWW.WASHINGTON.EDU/COMPMED/BILLING-AND-FINANCES/ANIMAL-PURCHASING/AQUATIC-ANIMALS/

OCTOPUS TRANSPORT

- ANIMALS SHOULD BE TRANSPORTED IN A SECURE FASHION (*E.G.*, TANKS WITH TIGHT FITTING LIDS).
- TANKS MUST BE DRAPED **AT ALL TIMES** DURING TRANSPORT, **EVEN IF EMPTY**!
- TRANSPORT SHOULD NOT BE THROUGH HEAVY TRAFFIC AREAS, IF AT ALL POSSIBLE.
- DRAPES OR COVERINGS MUST BE SUPPLIED BY THE DECENTRALIZED FACILITY.

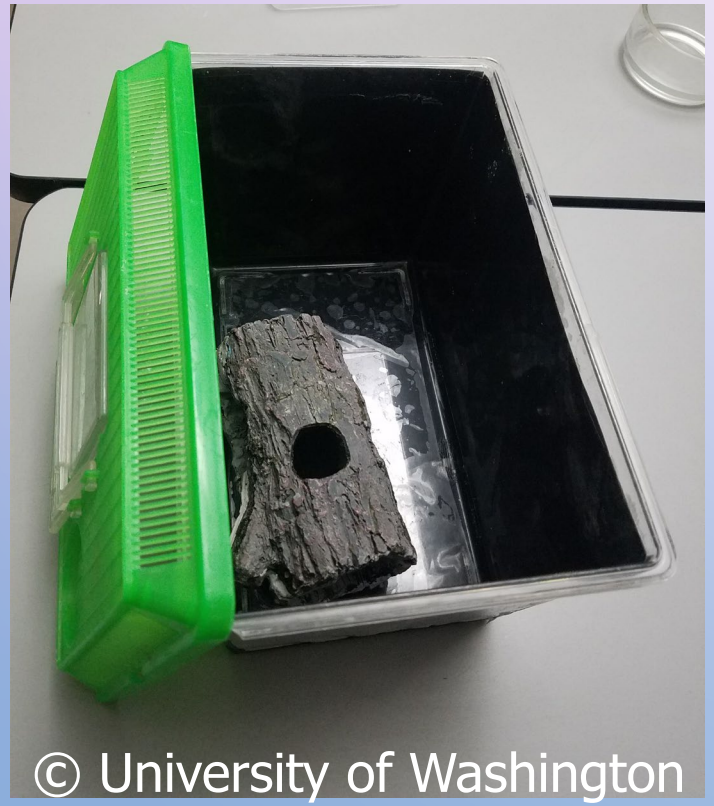


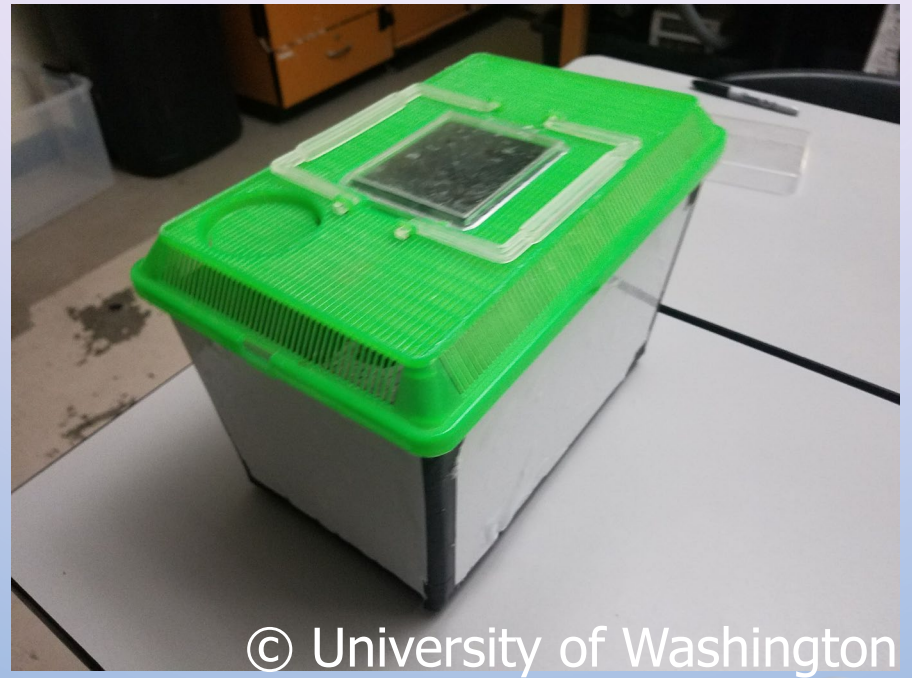
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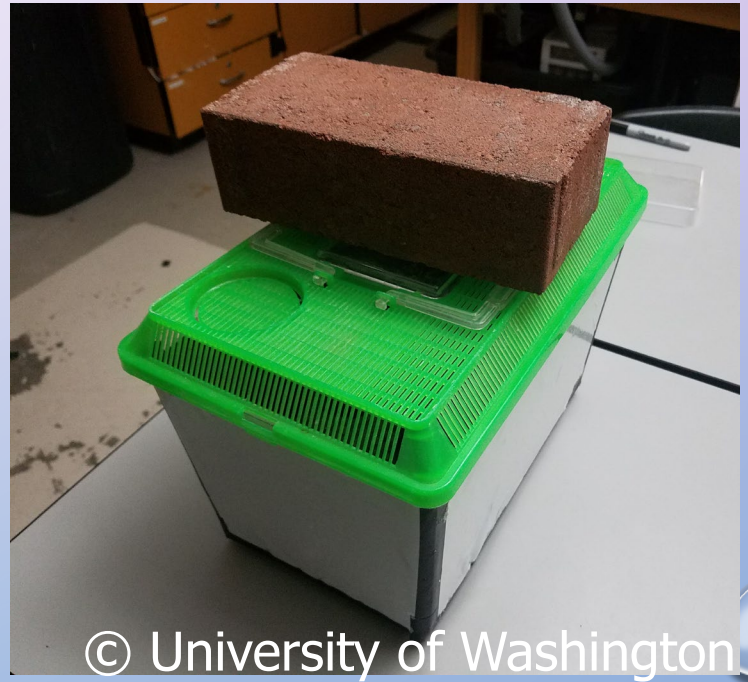
Transporting to/from field:

Plastic Liter bottles secured with mesh held within aerated (battery powered) cooler to maintain temperature during transport.

Local transport: Blacked out plastic critter container
It is recommended to include a familiar den option from enclosure.
If unattended, **you must** take proper escape proofing precautions.







VERMIN MONITORING AND CONTROL

- A MONITORING AND CONTROL PROGRAM FOR VERMIN MUST BE AN ONGOING PART OF EVERY ANIMAL HOUSING FACILITY.
- MONITORING FOR INSECTS AND WILD RODENTS IS VITAL TO RESEARCH ANIMAL AND HUMAN HEALTH.
- ENSURE THAT EVERYONE IN YOUR FACILITY IS ACTIVELY LOGGING ALL VERMIN OBSERVED ON A “VERMIN LOG”.

VERMIN MONITORING AND CONTROL

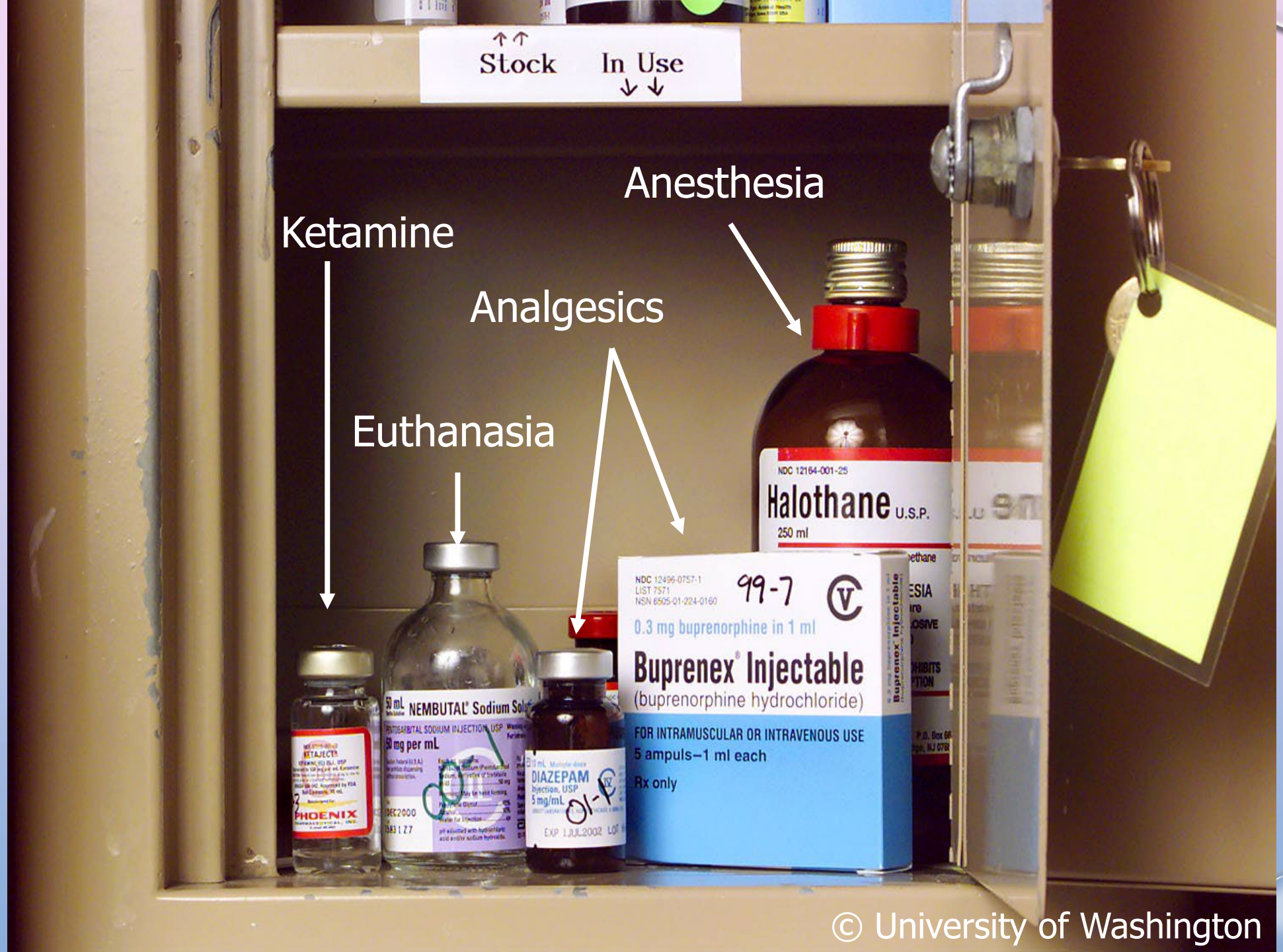
- CREATE AN IN-HOUSE SOP FOR MONITORING AND REPORTING.

- ENVIRONMENTAL HEALTH AND SAFETY (EH&S) IS RESPONSIBLE FOR THE CONTROL OF VERMIN ON CAMPUS. IF YOU ARE IN ONE OF THE OFF-SITE FACILITIES, CONTACT YOUR BUILDING MANAGER TO ENSURE THAT THERE IS A VERMIN CONTROL PROGRAM IN PLACE FOR YOUR BUILDING.

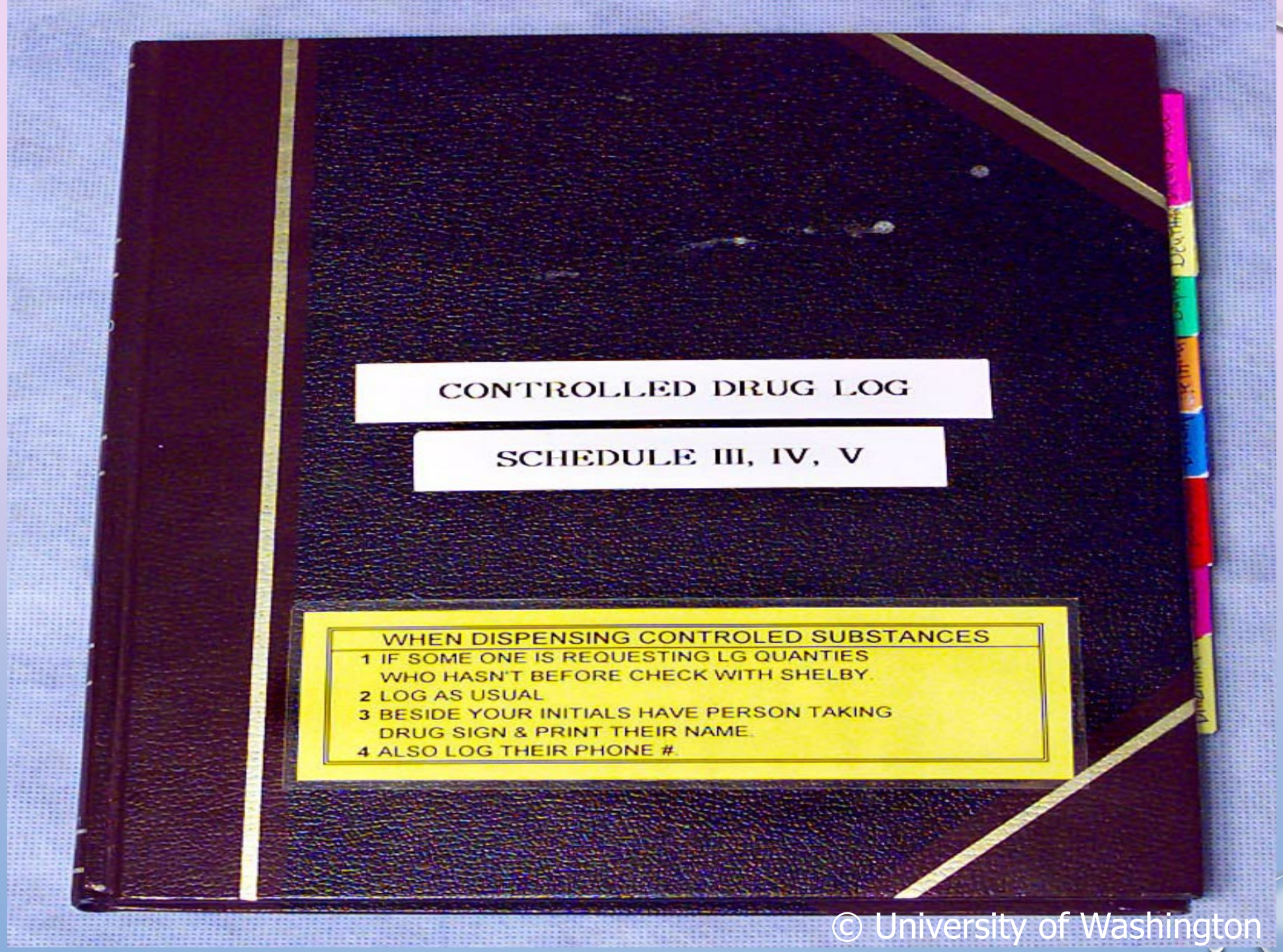
- EH&S VERMIN CONTROL CONTACT INFORMATION:
  - CHARLES EASTERBERG: (206) 543-7209
  - UNIVERSITY SANITARIAN'S OFFICE: (206)-543-9510
  - HTTP://WWW.EHS.WASHINGTON.EDU/OHSSAN/INDEX.SHTM

IMPORTANT REMINDERS: CONTROLLED DRUGS

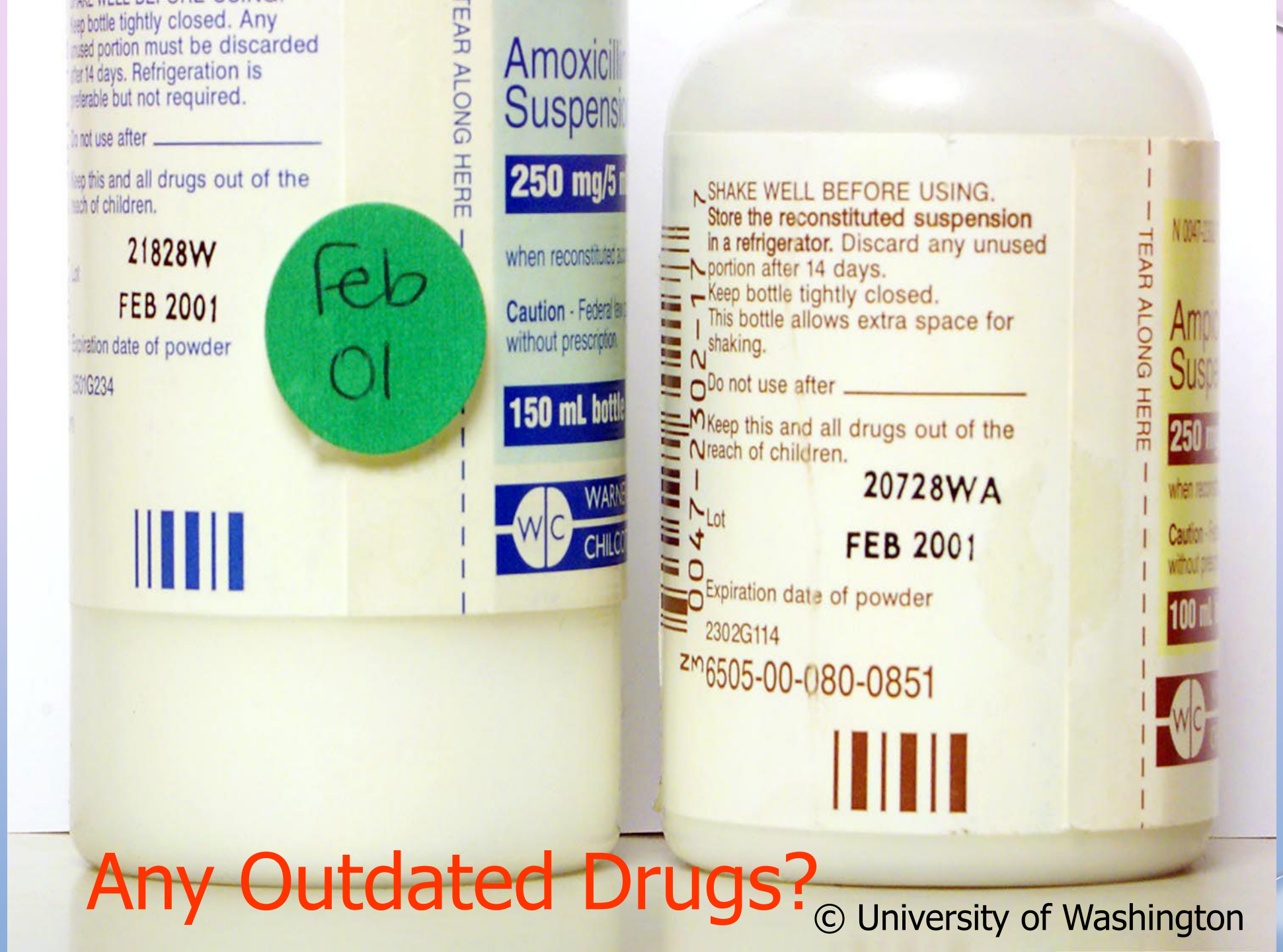
- ALL CONTROLLED SUBSTANCES **MUST** BE LOCKED UP IN A SECURE FASHION, THE AMOUNT USED RECORDED IN AN ORGANIZED LOG BOOK, AND DISPOSED OF PROPERLY AS PER DEA REQUIREMENTS.



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Any Outdated Drugs?

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IMPORTANT REMINDERS: FOOD

- THE PRODUCTION DATE OR EXPIRATION DATE **MUST** BE WRITTEN LEGIBLY ON **ALL** CONTAINERS USED TO HOLD ANIMAL FEED.
- FEED SHOULD BE USED OR DISCARDED 6-12 MONTHS (DEPENDING UPON STORAGE CONDITIONS) AFTER DATE OF OPENING IF FEED IS NOT MANUFACTURED AND HAS NO EXPIRATION DATE.
- SOME FEEDS HAVE SHORTER OR LONGER SHELF-LIVES. CONSULT MANUFACTURERS' RECOMMENDATIONS FOR ADDITIONAL INFORMATION IF NEEDED.

- Make sure feed bags are stored off the floor and away from walls.


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THIS RACK FOR
FISH FOOD STORAGE
ONLY
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Product of Canada
07.16.2008


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Recd
1/25/08
Bio-Oregon
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www.bio-oregon
ADVERTENCIA
• Niños pueden caerse
en un cubo y ahogarse
• Mantenga a los niños
07.16.2008

Important Reminders: Safety



Do not re-cap needles!!

Re-capping needles is unsafe!

IMPORTANT REMINDERS: EUTHANASIA

- ALL EUTHANASIA TECHNIQUES THAT ARE UTILIZED MUST BE APPROVED ON THE IACUC PROTOCOL.
- CHEMICAL AGENTS: [ETOH & MGCL2] ARE THE METHODS OF CHOICE FOR EUTHANASIA.
- USE OF PHYSICAL EUTHANASIA TECHNIQUES ALONE REQUIRE IACUC APPROVAL AND CERTIFICATION OF PERSONNEL.
  - PHYSICAL EUTHANASIA MUST BE FOLLOWED BY AN ADJUNCT METHOD TO ENSURE DEATH.

IMPORTANT REMINDERS: UW IACUC PROTOCOL

- ALL PROCEDURES BEING PERFORMED ON ANIMALS, AND ALL PERSONNEL PERFORMING THESE PROCEDURES, MUST BE ON THE APPROVED UW IACUC PROTOCOL.

- BEFORE MAKING ANY CHANGES WITH REGARDS TO EXPERIMENTAL PROCEDURES ON ANIMALS, A SIGNIFICANT CHANGE MUST BE SUBMITTED TO AND APPROVED BY THE UW IACUC.

IMPORTANT REMINDERS: UW IACUC PROTOCOL CONT.

PROTOCOL EXPIRATION: EXPIRATION OF A PROTOCOL WITHOUT THE TIMELY SUBMISSION OF AN APPROPRIATE RENEWAL:

- **3-YEAR RENEWAL WAS DUE**: EXPIRATION WILL NECESSITATE AN **IMMEDIATE STOPPAGE OF ALL *IN VIVO* PROCEDURES** LISTED ON THE EXPIRED PROTOCOL (UNTIL RE-APPROVAL IS OBTAINED).

  GROUP WILL ONLY BE ALLOWED TO PROVIDE NORMAL HUSBANDRY AND CARE OF ANIMALS UNTIL THE PROTOCOL IS RE-APPROVED BY THE UW IACUC.
- **ANNUAL RENEWAL WAS DUE**: MUST BE SUBMITTED TO IACUC IMMEDIATELY.

IMPORTANT REMINDERS: RADIOS

- THE USE OF RADIOS IS ALLOWED IN AQUATIC ANIMAL HOUSING AREAS PROVIDED THAT REASONABLE PRECAUTIONS ARE MADE TO PREVENT THE DANGER ASSOCIATED WITH EXPOSURE OF WATER TO RADIOS PLUGGED INTO ELECTRICAL OUTLETS.

- WHEN AT ALL POSSIBLE, THE USE OF INDIVIDUAL LISTENING DEVICES IS RECOMMENDED.

Refer to UW IACUC Policies:
https://uwnetid.sharepoint.com/sites/OAWRSS/OAWRSSWebsite/Policies

DEPARTMENT OF COMPARATIVE MEDICINE CONTACT INFORMATION

- **MAIN OFFICE: HSB, ROOM I-428**
  - PHONE: (206) 543-8047
  - HTTPS://DEPTS.WASHINGTON.EDU/COMPMED
- **ANIMAL PURCHASING: HSB, ROOM I-428**
  - PHONE: (206) 543-0640
  - HTTPS://DEPTS.WASHINGTON.EDU/COMPMED/ANIMAL
- **ANIMAL USE TRAINING: HSB, ROOM T-267**
  - PHONE:(206) 685-7363
  - EMAIL: AUTS@UW.EDU
  - HTTP://DEPTS.WASHINGTON.EDU/AUTS

INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE (IACUC) CONTACT INFORMATION

- **GENERAL QUESTIONS/CONCERNS:**
  - PHONE: (206) 685-7363
  - EMAIL: OAWRSS@UW.EDU
- **IACUC WEB PAGE:**
  - HTTP://OAW.WASHINGTON.EDU/

LAB MANAGED OVERSIGHT CONTACTS

- **GEORGE SANDERS, DVM, MS**
  - PHONE: (206) 543-4652
  - GSANDER@UW.EDU
- **OFFICE OF ANIMAL WELFARE**
  - (206) 685-7363
  - HSB, ROOM T-254
  - OAWRSS@UW.EDU
- **DAVID CARSON, LVT**
  - PHONE: (206) 543-6257
  - DCARSON@UW.EDU

LAB MANAGED OVERSIGHT VISITS

- NOT ASSOCIATED OR RELATED TO SEMI-ANNUAL UW IACUC SITE VISITS!
- THESE SITE VISITS ARE SCHEDULED BUT MAY OCCUR ON A RANDOM BASIS.
- OVERSIGHT VISITORS: OAW SENSAPHONE TECHNICIAN, DR. GEORGE SANDERS, AND/OR OTHERS FROM THE DEPARTMENT OF COMPARATIVE MEDICINE OR OAW.

LAB MANAGED OVERSIGHT VISITS CONT.

- RATIONALE FOR VISITS:
  - EVALUATION OF USE OF STANDARD ANIMAL HUSBANDRY AND CARE ISSUES TAUGHT IN THIS CLASS.
  - EVALUATION OF ACTUAL PROCEDURES USED IN ANIMAL CARE AND MAINTENANCE OF ANIMAL RECORDS.
  - INCREASING FREQUENCY OF OVERSIGHT VISITS TO THAT WHICH IS DONE IN CENTRALIZED FACILITIES.
  - INCREASING COMMUNICATION WITH DECENTRALIZED FACILITIES AND PERSONNEL.

LAB MANAGED OVERSIGHT VISITS CONT.

- REPORTS GENERATED FROM OVERSIGHT VISITS WILL BE FORWARDED TO THE PI, PRIMARY CONTACT, AND/OR FACILITY MANAGER.
- ISSUES NOTED MUST BE ADDRESSED AS SOON AS POSSIBLE.
- VISITOR WILL ASSIST IN THE RESOLUTION OF ISSUES NOTED IN THE REPORT.

THANK YOU!!



University of Washington Lab Managed Animal: Husbandry - Sick Animal Recognition of Octopus

Created by

George E. Sanders, DVM, MS

Presented by

George E. Sanders, DVM, MS

or

Dominic Sivitilli

HOUSING AND HUSBANDRY

- PRIMARY HOUSING MATERIAL: SMOOTH, IMPERMEABLE, NON-TOXIC, COMPATIBLE WITH WATER TYPE (NON-CORROSIVE), AND EASILY SANITIZED
- WATER DEPTH: VARIES PER SPECIES
- LIGHT CYCLE: 14:10 & UTILIZE DIM LIGHTING LEVELS TO MIMIC NATURAL ENVIRONMENT. NO EXPOSURE TO BRIGHT LIGHT!
- TEMPERATURE: VARIES PER SPECIES HOUSED
- WATER SPRAY: SHOULD BE MINIMIZED

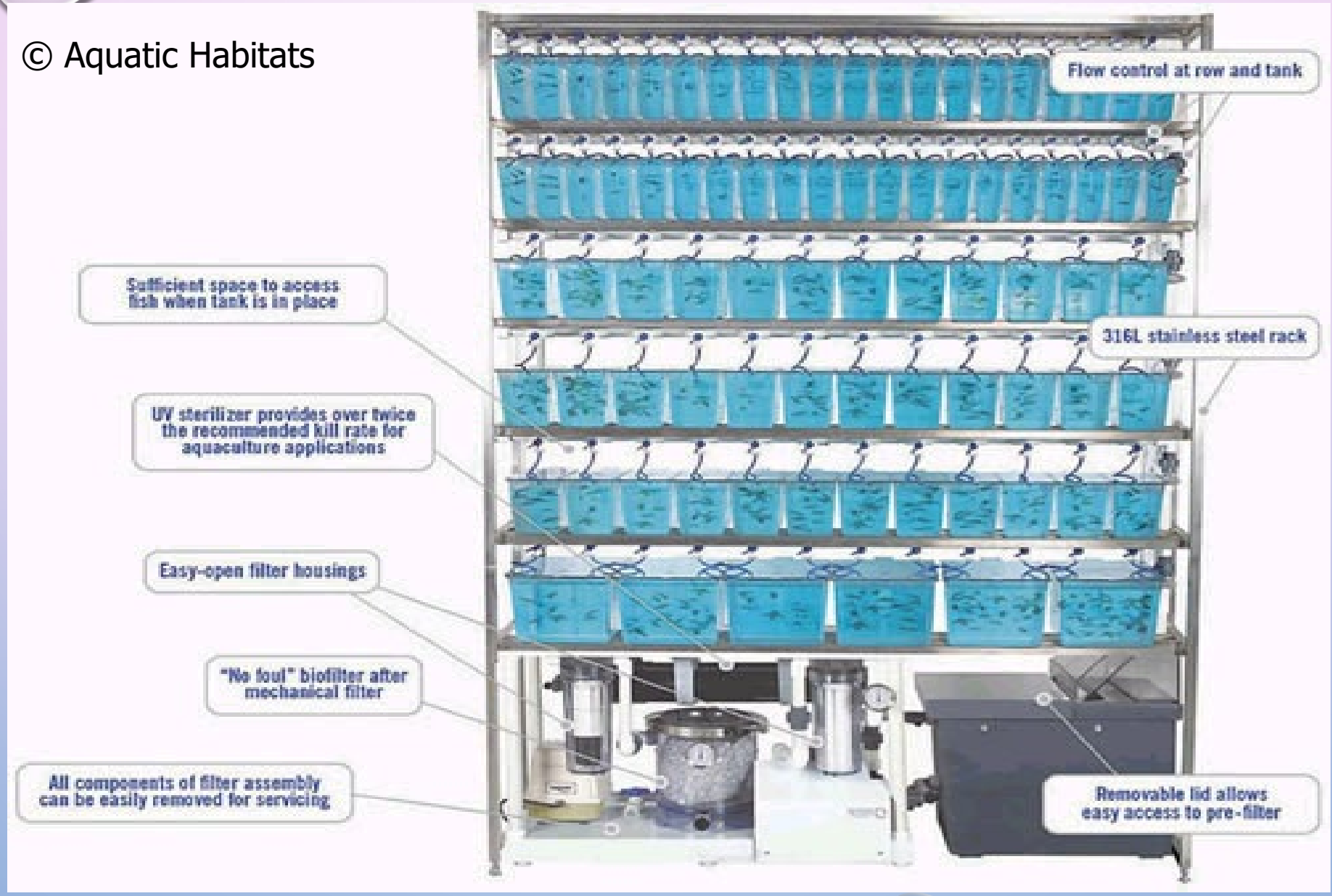
PRIMARY HOUSING TYPES

- STATIC
- FLOW-THROUGH (SINGLE PASS)
- **RECIRCULATING**

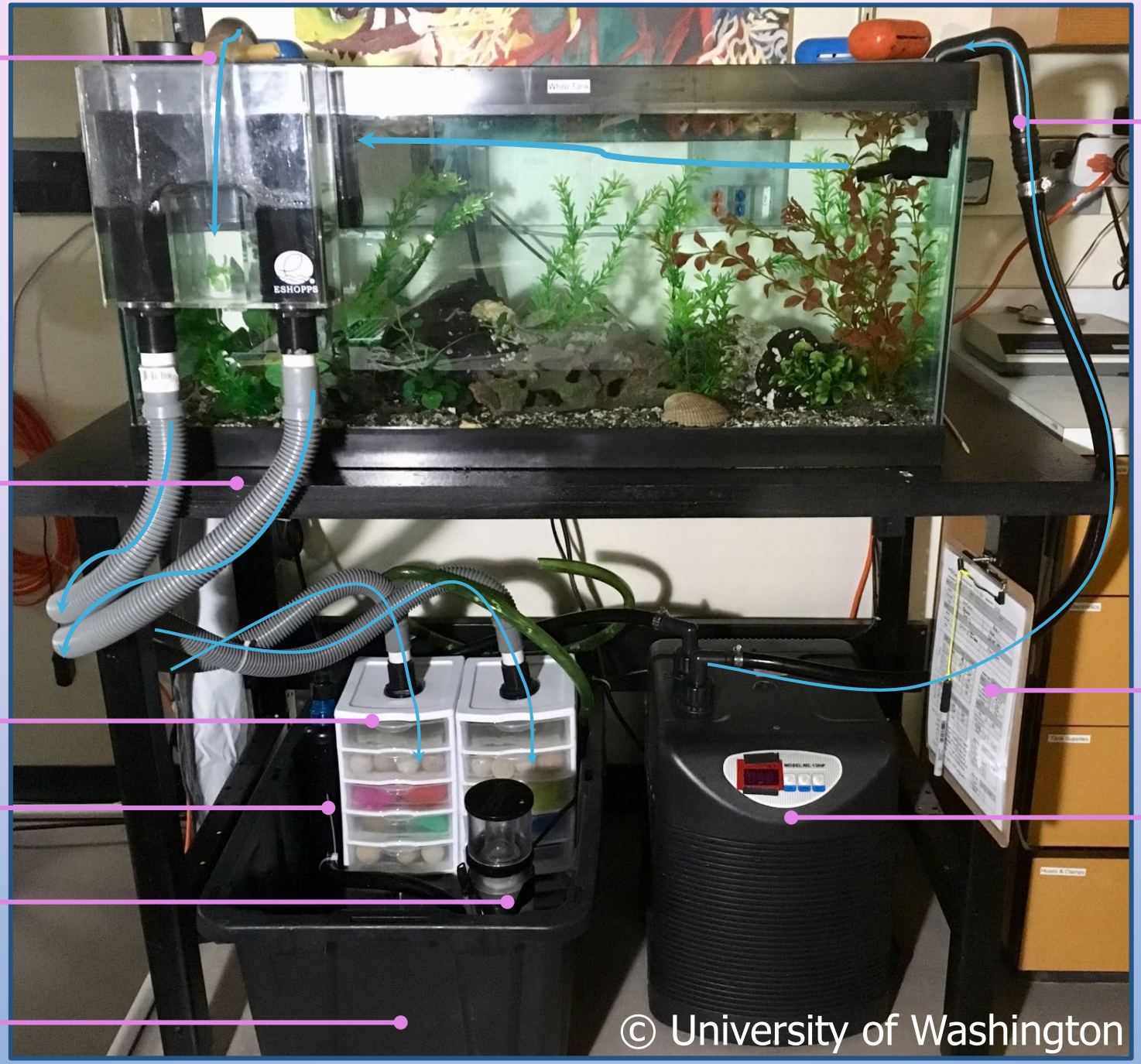
RECIRCULATING HOUSING

- MUST MONITOR AND ADJUST WATER QUALITY
- DIFFICULT TO CONTAIN CERTAIN DISEASE OUTBREAKS

© Aquatic Habitats



http://www.aquatichabitats.com/systems.html


Tank
Overflow box
Tank Return/
Inflow
Flex outflow
hoses
Mechanical
Filtration Towers
Tank Chart/Log
UV Filter
Chiller
Protein Skimmer
Return Sump
© University of Washington

SECONDARY ENCLOSURES

- WALLS, FLOORS, AND CEILINGS SHOULD BE IMPERVIOUS AND EASY TO SANITIZE.
- ELECTRICAL OUTLETS MUST BE GROUND FAULT INTERRUPTED (GFI).
- LIGHTS SHOULD BE ON TIMERS.
- ROOM SHOULD BE THERMOSTAT CONTROLLED.
- AEROSOLIZATION OF WATER SHOULD BE MINIMIZED.

EFFLUENT DISCHARGE/TREATMENT

- IF PLUMBED TO DRAINS, EFFLUENT FROM HOUSING SYSTEMS OR UNITS SHOULD, AT MINIMUM, PASS THROUGH SCREENS TO PREVENT THE ESCAPE OF LIVE ANIMALS OR FERTILIZED EGGS.
  - ADDITIONAL PRECAUTIONS MAY BE REQUIRED FOR NON-INDIGENOUS SPECIES OR GENETICALLY MODIFIED ANIMALS.
- RETENTION AREAS, MECHANICAL DEVISES, CHEMICAL, OR OTHER TREATMENT MAY BE REQUIRED TO TREAT EFFLUENT AS PER STATE OR FEDERAL REGULATIONS (*E.G., USDA, EPA*).

HOUSING AND HUSBANDRY

- <u>STOCKING DENSITY</u>
  - ADULTS: SPECIES DEPENDENT
    - SPACE OF SUFFICIENT COMPLEXITY TO ALLOW WIDE RANGE OF NORMAL BEHAVIOR
      - REQUIRES PROPER SUBSTRATE AND PROVISION OF DENS/HIDING REFUGES
    - ANIMAL GIVE SOME CONTROL AND CHOICE OVER ITS ENVIRONMENT
  - LARVAE/JUVENILES: SPECIES DEPENDENT

NOTE: Octopus are extremely escape artists! Tank lids must be secured by latches, locks, or heavy weights and must be tight fitting to prevent escapes.

HOUSING AND HUSBANDRY CONT.

- PRECAUTIONS: DUE TO THE VARYING LEVELS OF SUSCEPTIBILITY PER SPECIES, CARE MUST BE TAKEN TO PREVENT THE INTRODUCTION OF TOXIC SUBSTANCES INTO THE WATER.
- POTENTIAL TOXINS: AMMONIA, NITRITE, HEAVY METALS, IODINE, DISINFECTANTS, PVC ADHESIVES, PESTICIDES, CHLORINE, AND CHLORAMINE.
- WATER TEMPERATURE: SHOULD NOT FLUCTUATE >5°C OVER A 24 HR. PERIOD*.
- MINIMIZE NOISE AND VIBRATIONS

EQUIPMENT DISINFECTION

- HUSBANDRY EQUIPMENT (TANKS AND ACCESSORIES)
  - MUST BE DISINFECTED ON A REGULAR BASIS (*E.G.*, TANKS AFTER DEPOPULATION OR NETS AFTER USE BETWEEN TANKS).
  - BLEACH BATHS (5-10%) OR "NET SOAK" (PER COMMERCIAL PRODUCT INSTRUCTIONS)
    - REMOVE GROSS ORGANIC DEBRIS BY RINSING OR WASHING BEFORE SOAKING.
    - SOAKING CONTAINERS MUST BE LABELED WITH THE DATE THE DISINFECTION SOLUTION WAS REPLACED.
    - HUSBANDRY SOP SHOULD INCLUDE SPECIFICS ABOUT PRODUCT USE, CONCENTRATION, CONTACT TIME, AND SOLUTION REPLACEMENT.
  - DISINFECTED EQUIPMENT MUST BE ADEQUATELY RINSED AND/OR DECHLORINATED (SODIUM THIOSULFATE) BEFORE RE-USE.

EQUIPMENT DISINFECTION CONT.

- FEED/FOOD PRODUCTION EQUIPMENT (CONTAINERS)
  - MUST OCCUR AFTER A PRODUCTION CYCLE HAS BEEN COMPLETED (*E.G.*, AFTER LIVE FOOD PRODUCTION OR AFTER LOT OF FEED HAS BEEN FED).
  - WHEN DISINFECTANTS ARE USED, EQUIPMENT MUST BE ADEQUATELY RINSED AND/OR DECHLORINATED (SODIUM THIOSULFATE) BEFORE RE-USE.
- STANDING WATER ON FLOOR OR ON OTHER COMMON SURFACES SHOULD BE REMOVED REGULARLY.

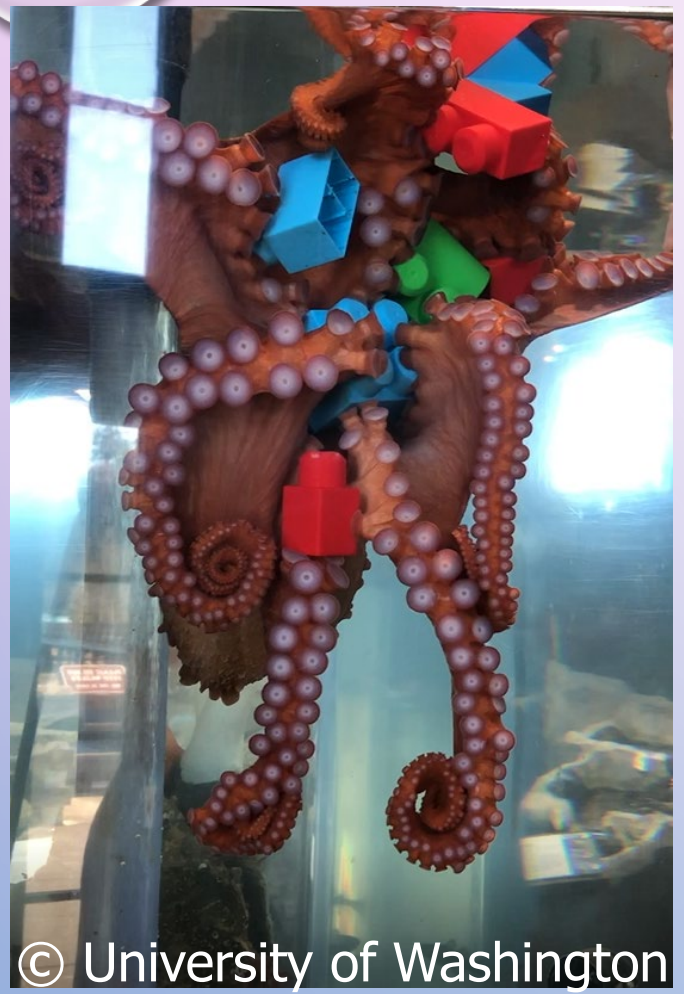
NUTRITION

- LARVAE/JUVENILES: SPECIES AND STAGE DEPENDENT
- ADULTS: SPECIES DEPENDENT
- FEEDING FREQUENCY: BASED UPON ACTIVITY LEVEL (BREEDING OR MAINTENANCE), AGE, OR LIFE CYCLE STAGE
  - LARVAE/JUVENILES: TYPICALLY DAILY
  - ADULTS: TYPICALLY DAILY OR TWO TO THREE TIMES WEEKLY

OCTOPUS ENRICHMENT

- REGULAR ENRICHMENT AND HANDLING PROMOTES HEALTHY BEHAVIOR, AND ALLOWS OCTOPUSES TO BECOME ACCUSTOMED TO CHANGES IN THEIR SURROUNDINGS WITHOUT A STRESSFUL RESPONSE, OR EVEN WITH THE EXPECTATION OF REWARD. THESE CHANGES COULD BE DUE TO CLEANING, EXPERIMENTATION, TRANSPORTATION, WEIGHING, MOVING OBJECTS IN AND OUT OF THE TANK, OR HUMAN ACTIVITY AROUND ENCLOSURE.
- RECOMMENDED FORMS OF ENRICHMENT INCLUDE: THE USE OF IN TANK DENS/REFUGES, HUMAN INTERACTION, ENVIRONMENTAL ELEMENTS: SUCH AS PROVIDING TOYS OR NOVEL SUBSTRATES AND OBJECTS, BEHAVIORAL SHAPING (*I.E. TRAINING*), AND THE MEANS TO COMBINE ENRICHMENT WITH BEHAVIORAL EXPERIMENTATION.
    - IMPORTANT TO PAIRING FEEDING WITH ENRICHMENT PLUS EXPOSURE TO NOVELTY ITEMS!

E. dofleini





O. rubescens



WATER QUALITY GENERAL GUIDELINES: OCTOPUS

- ALKALINITY: < 50 - 100 MG/L (PPM)
- HARDNESS: < 140-215 MG/L
- TEMPERATURE: 54 – 58 F (12.2 – 14.4 C)
- **PH** : 8.1-8.3 / SALINITY: 28 - 30 G/L (PPT)
- UN-IONIZED AMMONIA (NH_3): 0 MG/L
- **NITRITE** (NO^-_2): 0 MG/L
- **NITRATE** (NO^-_3): < 30 MG/L
- CHLORINE: 0 MG/L
- DO_2 : >80% SAT. / CO_2: < 5 MG/L

WATER QUALITY AND DISEASE

- LACK OF RED BLOOD CELLS MEANS THAT CEPHALOPOD BLOOD IS LESS EFFICIENT AT CARRYING DISSOLVED OXYGEN, MADE WORSE WITH INCREASED WATER TEMPS.
  - HIGH METABOLISM ⟹ USE O2 UP VERY QUICKLY, LOW TOLERANCE FOR DECREASED O2 IN WATER
  - VERY LOW TOLERANCE TO CHANGES IN PH
    - **ADJUST PH AT NO MORE THAN 0.1 / HOUR**
  - HIGH METABOLISM ALSO RESULTS IN HIGH AMMONIA BUILD UP
    - UPON ARRIVAL AFTER OVERNIGHT SHIPPING TOTAL AMMONIA NITROGEN WILL BE HIGH
    - NEED TO BALANCE PH CHANGES WITH NEED FOR AMMONIA WASH-OUT

Slide from Lisa Addo, DVM, MS – 70th National AALAS 2019

QUARANTINE

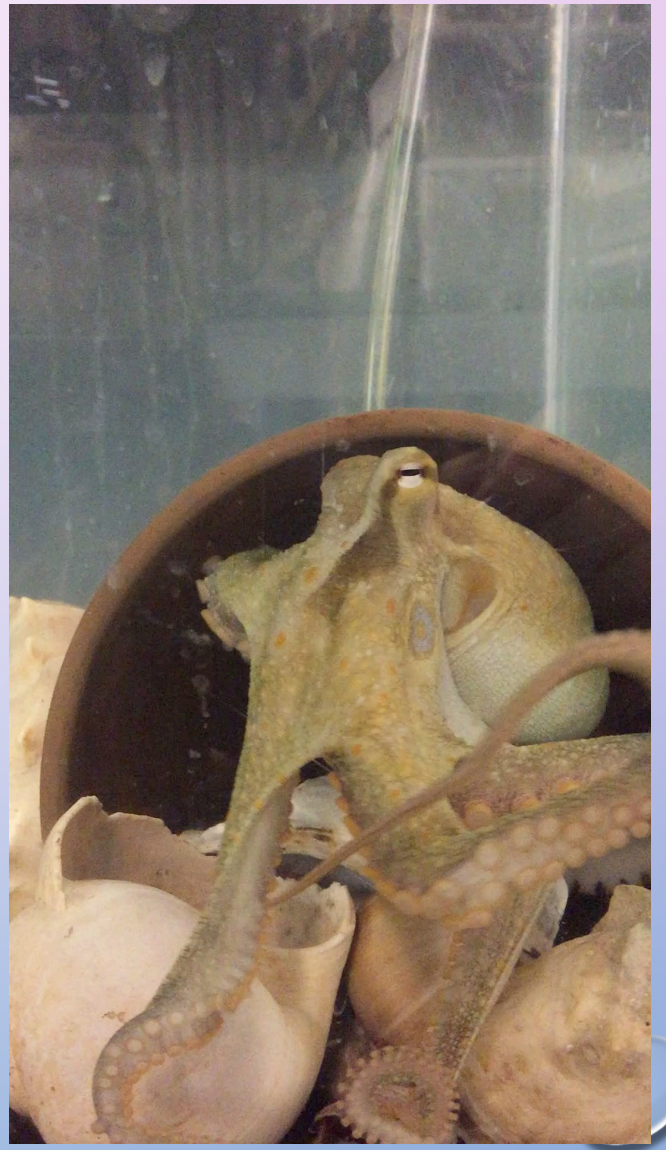
- RECOMMENDED FOR ALL NEW ACQUISITIONS.
- QUARANTINE SHOULD BE LOCATED IN A SEPARATE ROOM FROM THE MAIN COLONY.
- HUSBANDRY FOR ANIMALS IN QUARANTINE **MUST** BE DONE LAST AND WITH DEDICATED EQUIPMENT.
- DURATION $\geq$ 2-6 WEEKS OR LONGER.
- MONITOR FOR SIGNS OF SICKNESS. IF SEEN, ISOLATE INDIVIDUALS AND CONTACT VETERINARY SERVICES.

PSYCHOLOGICAL AND PHYSICAL WELL-BEING

- BEING ABLE TO IDENTIFY VARIOUS BEHAVIORAL STATES:
  - USE INDICATORS – COLOR, POSTURE, AND MOVEMENT PATTERNS
  - COMFORTABLE AND CONFIDENT – OCTOPUS TEND TOWARD EXPLORATORY BEHAVIOR
  - TIMID OCTOPUS TEND TO BE CAUTIOUS AND AVOIDANT
  - OTHER BEHAVIOR STATES OBSERVED:
    - DISTRESSED
    - INACTIVE OR SENESCENT
    - STEREOTYPIC – INADEQUATE ENRICHMENT OR LACK OF COMPLEXITY OF ENRICHMENT
- EVALUATE AND MONITOR THIS OVER TIME AND DURING INTERACTIONS

HEALTHY CEPHALOPOD

- DEPENDS A LOT ON THE SPECIES BUT GENERALLY…
  - EYES OPEN AND RESPONSIVE WHEN APPROACHED
  - NORMAL AND CONSISTENT RESPIRATORY RATE
  - FEEDS VERY QUICKLY WHEN PREY IS INTRODUCED
  - FEEDS MULTIPLE TIMES A DAY (SPECIES SPECIFIC)
  - DIURNAL OR NOCTURNAL BEHAVIOR NORMAL FOR ITS SPECIES
  - MAINTAINS NEUTRAL BUOYANCY
  - NORMAL SKIN PATTERNING AND CAMOUFLAGE REPERTOIRE, NO WHITE LESIONS



Slide and Video from Lisa Addo, DVM, MS – 70th National AALAS 2019

CRITERIA FOR CEPHALOPOD WELFARE ASSESSMENT

APPEARANCE
SKIN COLOR, PATTERN AND TEXTURE
SKIN AND EXTERNAL SHELL INTEGRITY
EYES (PUPIL, CORNEA, POSITION)
BODY POSTURE AND ORIENTATION

Behavior
location in tank and water column
swimming and locomotor activity
use of arms and tentacles
interactions with humans, conspecifics
inking

Feeding:
food intake
time to attack

Body weight/
Mantle length

Ventilation
rate
depth



Slide from Emily Northrup, DVM, PhD – 70th National AALAS 2019

TYPICAL CLINICAL SIGNS OF A SICK OCTOPUS

- SKIN LESIONS:
  - ULCERATION – TRAUMA, HANDLING
  - WOUNDS – TRAUMA, HANDLING
- AUTOPHAGY – BLUNTING/WHITE TIPPING OF ARMS FROM SELF-MUTILATION
- FLOATING OR EQUILIBRIUM DISTURBANCES
- LETHARGY, ANOREXIA, WEIGHT LOSS, AND EMACIATION
- SENESCENCE / DEATH
- DEPRESSION OF VENTILATION
- DECREASE IN CHROMATOPHORE TONE
- REDUCED ARM ACTIVITY, TONE, AND SUCKER ADHESION
- LOSS OF NORMAL POSTURE AND RIGHTING REFLEX
- REDUCED OR ABSENT RESPONSE TO NOXIOUS STIMULUS

SIGNS OF SEVERE PAIN SUFFERING OR DISTRESS

- ANIMAL PALE AND FAIL TO CHANGE COLOR WHEN CHALLENGED
- FULL THICKNESS SKIN LESIONS > 10 % OF APPARENT SURFACE
- UNRETRACTED TENTACLES IN CUTTLEFISH OR SQUID
- BILATERAL CLOUDING OF CORNEAS
- NO DESIRE OR UNABLE TO ATTACK LIVE PREY
- SQUID REMAIN AT FLOOR OF TANK OR CUTTLEFISH NEAR WATER SURFACE



Fiorito et al., 2015

Slide from Emily Northrup, DVM, PhD – 70th National AALAS 2019

SENESCENCE

A RAPID DECLINE IN HEALTH LEADING TO DEATH

- BEGINS AFTER MATING IN MALES OR AFTER EGG-LAYING AND BROODING IN FEMALES

- CLINICAL SIGNS
  - ANOREXIA
  - SKIN LESIONS
  - RETRACTED SKIN AROUND THE EYES
  - CHANGE IN ACTIVITY
  - UNCOORDINATED OR UNUSUAL BEHAVIOR
- DIE OF STARVATION OR INFECTION SECONDARY TO IMMUNE DYSFUNCTION

Slide from Lisa Addo, DVM, MS – 70th National AALAS 2019

WHAT TO DO WITH A SICK OCTOPUS?

- ISOLATE INDIVIDUAL(S) FROM REMAINING POPULATION INTO A SEPARATE CONTAINER.
- CONTACT VETERINARY SERVICES, VIA SICK ANIMAL REPORT FORM, TO ADEQUATELY ASSESS AND DIAGNOSE CONDITION.
- MONITOR REMAINDER OF EXPOSED INDIVIDUALS FROM POPULATION FOR SIMILAR SIGNS OR DIFFERENT SIGNS.

SAFE INTERACTIONS / HANDLING OF OCTOPUS

- ALL REQUIRE EDUCATION, TRAINING, PRACTICE, AND PATIENCE:
  - HOW TO EXTRACT OCTOPUSES FROM THEIR DENS WITHOUT PROVOKING A STRESS RESPONSE?
  - HOW TO ENCOURAGE INTERACTION AND USING THIS AS A FORM OF ENRICHMENT?
  - HOW TO SAFELY REMOVE AN OCTOPUS' HOLD ON ONE'S HAND, WRIST, AND ARM?
  - HOW TO SUCCESSFULLY NET AN OCTOPUS?
- WILL BE TAUGHT AND DEMONSTRATED IN THE **LAB MANAGED OCTOPUS: HANDS-ON HUSBANDRY AND HANDLING** CLASS.

EUTHANASIA METHODS: OCTOPUS

- PREFERRED METHOD - ANESTHETIC OVERDOSE:
  - **ETHANOL**: 1.0 – 5.0% (10 TO 50 ML/L - LOW DOSE SEDATION INCREASED TO EFFECT)
    - WAIT 15 MINUTES PAST THE CESSATION OF BREATHING/SIPHON CONTRACTION
  - **MAGNESIUM CHLORIDE**: 7.5% (75G/L IN DI WATER) THEN ADDED WITH INCREASING RATION UP TO 1:1 WITH SEAWATER
    - WAIT 10 MINUTES PAST THE CESSATION OF BREATHING/SIPHON CONTRACTION
- MUST BE FOLLOWED BY A SECONDARY METHOD TO ENSURE DEATH:
  - **CERVICAL TRANSECTION**: HEAD-MANTLE AND BETWEEN EYES, **EXSANGUINATION**: CEPHALIC ARTERY OR DORSAL AORTA, OR **DECEREBRATION**
  - **TISSUE FIXATION** (70% ETOH/10% FORMALIN) OR **CARCASS FREEZING**
- PRIMARY PHYSICAL EUTHANASIA METHODS*:
  - *CERVICAL TRANSECTION*: HEAD-MANTLE AND BETWEEN EYES
  - MUST BE FOLLOWED BY A SECONDARY METHOD TO ENSURE DEATH (SEE ABOVE)
    - **PHYSICAL METHOD USED ALONE REQUIRES IACUC APPROVAL AND CERTIFICATION**

AVMA Guidelines on Euthanasia, 2020.
https://www.avma.org/sites/default/files/2020-01/2020-Euthanasia-Final-1-17-20.pdf

ANIMAL CARCASS DISPOSAL

- CARCASSES ARE TYPICALLY FROZEN.
- ON A SCHEDULED BASIS, CARCASSES ARE TRANSFERRED TO SANITARY LANDFILL OR BIOHAZARD DISPOSAL AS PER INDIVIDUAL FACILITIES' SOP.
  - FACILITY SOP SHOULD INCLUDE ANIMAL CARCASS DISPOSAL/BIOHAZARD WASTE COMPANY, PROCEDURES, AND SCHEDULES.

ZOONOTIC AGENTS: OCTOPUS

- BACTERIAL: PRIMARILY GRAM NEGATIVE RODS, (*VIBRIO SPP.*), ALSO GRAM-POSITIVE COCCI AND ACID-FAST RODS (*MYCOBACTERIUM SPP.*).
- PROTOZOAN: CRYPTOSPORIDIUM OR COCCIDIA (*AGGREGATA SPP.*)?
- HELMINTH: TREMATODES, CESTODES, NEMATODES (*ANISAKIS SPP.*)
- FUNGAL: TRICHOPHYTON, CANDIDA
- POTENTIAL ALLERGENS FROM SKIN/MUCOUS
  - ADULTS AND EGGS
- EXPOSURE TO CONTAMINATED SEAWATER

IMAGES IN CLINICAL MEDICINE

Mycobacterium marinum



Chau Nguyen, M.D.

Memorial University of Newfoundland
St. John's, NF A1B 3V6, Canada

A SMALL, RAISED, ERYTHEMATOUS LESION DEVELOPED ON THE DORsum of the hand of a 35-year-old man who worked in a pet shop. Over a period of three months, there was progressive spreading of nodular lesions from his hand to just above his elbow. There was no epitrochlear or axillary adenopathy. The patient did not have fever or other symptoms. His duties included cleaning fish tanks daily, which he did without wearing protective gloves. Needle aspiration of a nodule recovered thick, purulent fluid that was positive for acid-fast bacilli, identified on culture as *Mycobacterium marinum*. The patient was treated successfully with a four-month regimen of rifampin and ethambutol.

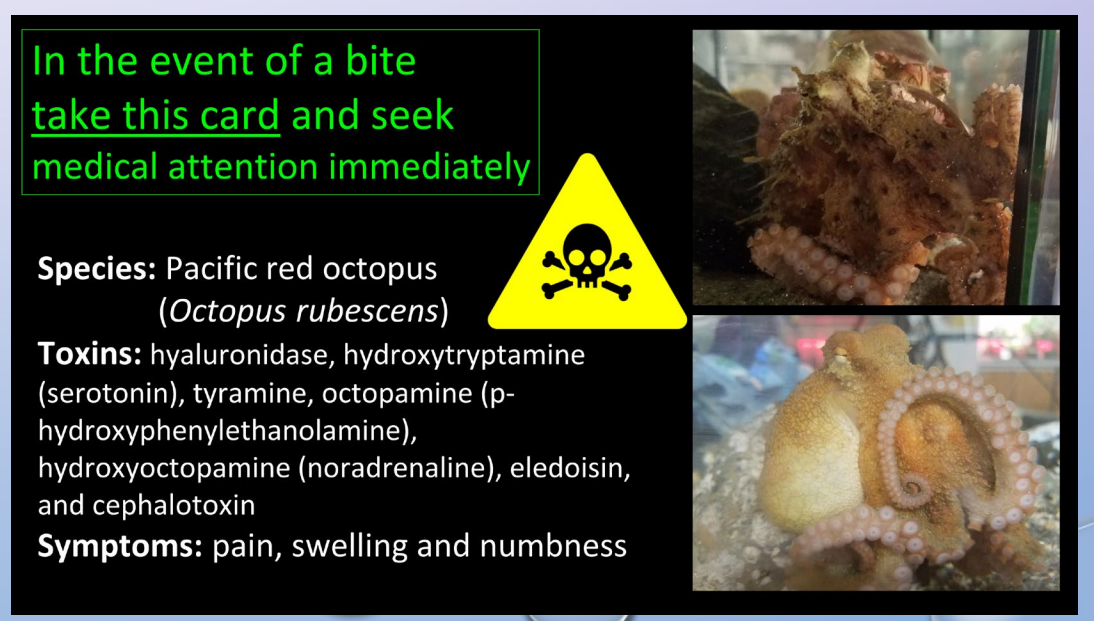
M. marinum infection is an occupational hazard for aquarium cleaners, fishermen, and seafood handlers. Since growth of the organism requires a low temperature (between 24° and 32°C), infection is usually limited to the skin, with the hands, elbows, and feet most commonly affected. Dissemination of the infection, even among immunocompromised patients, is rare.

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ENVENOMATION

- LOW POTENTIAL FOR THIS EVENT UNLESS BITTEN BY THE BEAK, (A SET OF CHITINOUS MANDIBLES), LOCATED IN FRONT OF THE MOUTH/BUCCAL MASS OF THE OCTOPUS
- VENOM IS ASSOCIATED WITH PARIED POSTERIOR SALIVARY GLANDS
- THIS POTENTIAL REQUIRES USE OF "PULL TAGS" LOCATED ON TANKS SO THAT ONE CAN TAKE WITH THE INDIVIDUAL TO HOSPITAL, IF NECESSARY!
  - ONE "PULL TAG" PER TANK WITH:
    - COMMON NAME OF OCTOPUS
    - GENUS & SPECIES OF OCTOPUS
    - VENOM COMPONENTS OF OCTOPUS



Slide and video from Lisa Addo, DVM, MS – 70th National AALAS 2019



OCTOPUS VENOM COMPONENTS

- <u>GENERAL TOXIN TYPES OF MOST OCTOPUS SPECIES:</u>
  - HYALURONIDASE, HYDROXYTRYPTAMINE (SEROTONINE), TYRAMINE, OCTOPAMINE (P-HYDROXYPHENYLETHANOLAMINE), HYDROXYOCTOPAMINE (NORADRENALINE), ELEDOISIN, AND CEPHALOTOXIN.
- CLINICAL SIGNS SEEN IN HUMANS AFTER ENVENOMATION EVENTS WOULD BE: PAIN, SWELLING, AND NUMBNESS AT SITE.
- **MACULOTOXIN = TETRODOTOXIN – TOXIN PRIMARILY ASSOCIATED WITH BLUE-RINGED OR BANDED OCTOPUS.**
- CLINICAL SIGNS SEEN IN HUMANS AFTER THIS ENVENOMATION EVENT WOULD BE: GENERAL MUSCLE WEAKNESS, TINGLING SENSATIONS OF FACE, NECK, AND LIMBS, GENERAL NUMBNESS. +/- NAUSEA & VOMITING. SWALLOWING AND RESPIRATORY DIFFICULTY, VISUAL DISTURBANCE, ATAXIA, & RESPIRATORY PARALYSIS OF VOCAL, PHARYNGEAL, TONGUE MUSCLES, AND RESPIRATORY SYSTEM.
- *VENOMOUS AND POISONOUS ANIMALS* - DIETRICH MEBS, FRANKFURT – **CRC PRESS - 2002**

THANK YOU FOR YOU ATTENTION!! – ANY QUESTIONS??



Photo from Lisa Addo D.V.M., M.S - MBL

Photo from Lisa Addo D.V.M., M.S - MBL

