

2017-18 Teaching Academy

All Rush University Faculty Members

are invited to the 2017-17 Teaching Academy for skill and knowledge enhancement!

Presentations will be held every third Tuesday of the month from

12 – 1 p.m. in Room 994, Armour Academic Center.

Lunch will be provided.

Teaching Academy Series

| | |
|----------------|--|
| July 18, 2017 | Navigating Challenging Interactions: Frames, Face and the Floor |
| Aug. 15, 2017 | Creating an Effective Workshop |
| Sept. 19, 2017 | The Neuroscience of Substance Abuse: From Experimentation to Addiction |
| Oct. 17, 2017 | Creating and Presenting Captivating Educational Materials |
| Nov. 21, 2017 | Adding a Health Equity Lens to Your Academic Scholarship Work |
| Dec. 19, 2017 | Budget Justifications for Research Funding |
| Jan. 16, 2018 | The Non-science Components of a Grant Proposal |
| Feb. 20, 2018 | Copyright Issues and Answers in the Flipped Classroom |
| March 20, 2018 | Voice Care for Health-Care Providers? |
| April 17, 2018 | Everyday Bias-Identifying our Biases to Create a Better University |
| May 15, 2018 | Best Practices for Classroom Management |
| June 19, 2018 | Maximizing Rush Library Resources |

For more information and to RSVP,
Contact Office of Faculty Affairs at

Faculty_Affairs@rush.edu or (312) 942-8873.

Navigating Challenging Interactions

...

Frames, Face and the Floor

Kirsten Broadfoot, PhD
Academy of Medical Educators
University of Colorado School of Medicine



Session Overview

- Introductions and Agenda Setting (15 minutes)
- World Café on Challenging Interactions (45 minutes)
- Navigating Challenging Interactions: Frames, Face and the Floor (30 minutes)
- Fishbowl Practice (75 minutes)
- Debrief and Discussion (15 minutes)

World Café

- Instructions:

- Count off by 4
- In your group, **CHOOSE a leader**
- Respond to and discuss question
 - 5-7 min per question
- Rotate table/ **leader stays PUT**
- At the end, leader reports out and posts



- Leader Role:

- Read question
- Facilitate conversation
- Record info- although anyone can write or draw anytime

- Participant Role:

- Be engaged
- Be creative in your responses. **There is no right or wrong.**
- Speak and respond to each other not just to the facilitator.

Debrief



Questions:

- Communication or other behaviors used to inhibit you from being effective in your leadership - at meetings, through email, etc. Approaches to addressing it?
- Kinds of feedback or other communication/interaction that are most challenging; kinds of people/ personalities hardest to engage with?
- Facilitators of good difficult conversations; strategies that may be different depending on who you are?
- Facilitators of bad difficult conversations; strategies or skills that are particularly risky or different depending on who you are?

Step 1: Human Nature

- *“man is the symbol using (symbol – making, symbol-misusing) animal, inventor of the negative (or moralized by the negative), separated from his natural condition by instruments of his own making, goaded by the spirit of hierarchy (or moved by the sense of order), and rotten with perfection.”*

(Burke, 1996, Language as Symbolic Action.)



Step 1: Understanding Interaction

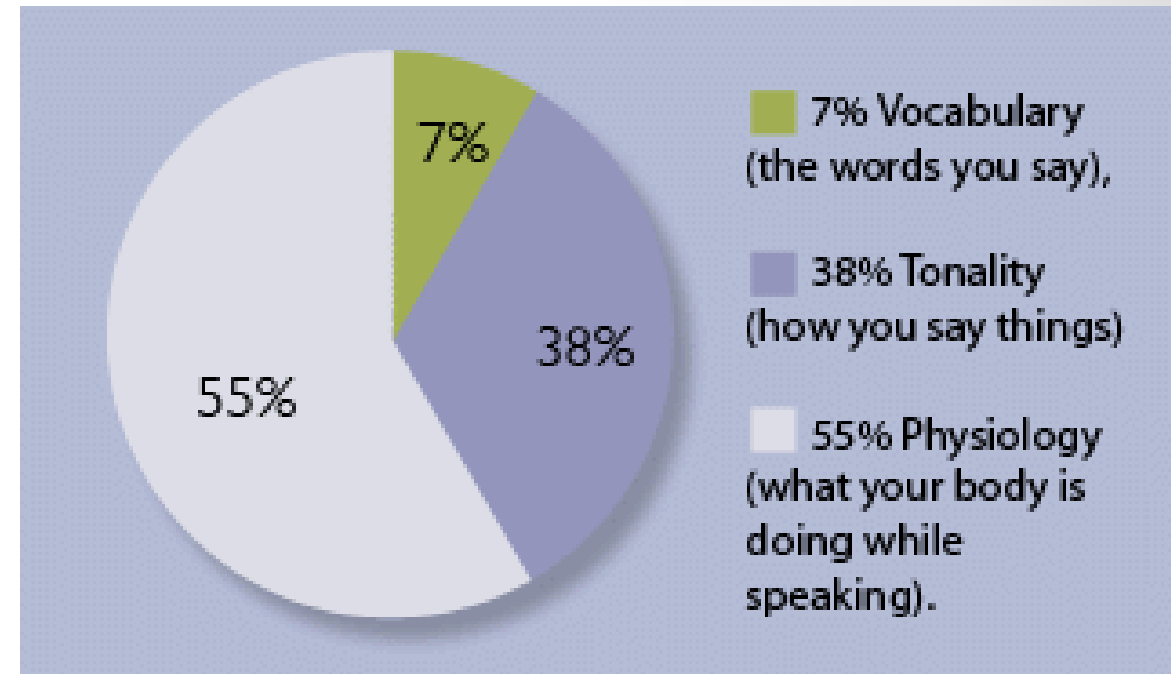
- “Change the way you see the world and you will change what you see”
- Inter-Action – every conversation is created iteratively and helically by 2 people (or more)
 - It is **not** information transmission
 - It is **not** linear
 - **It IS purposeful**



<http://theconversation.com/explainer-quadruple-helix-dna-11803>

Step 1: Words, Bodies and Storytelling

- Every message has two dimensions
 - **Content** – what we say (words)
 - **Relationship** – how we say it (bodies)
 - We read bodies in signal clusters and can create multiple interpretations
 - Words reduce, clarify, dispel, and confirm Interpretations and meaning



The body does not lie and it always leaks – even when you are silent, you tell stories.

Step 2: Challenges to/of a Relational Interaction and Leadership Style

- **A relational communication style** is traditionally considered feminine and linguistically characterized by rapport or relationship building:
 - **Complex** – uses dependent clauses and complex sentences
 - **Ambiguous/Invitational** - Fillers (uh, I mean), tag questions (isn't it? Right?), hedges (probably, kind of)
 - **Descriptive** - Intensive adverbs (extremely, very) and negations (didn't, couldn't)
 - **Uses personalized justification** - Personal pronouns, self references, justifiers



Step 2: Challenges to/of a Relational Interaction and Leadership Style

- **Emotional Labor** (Hochschild, 1983)
 - The process of managing feelings and expressions to fulfill the emotional requirements of the job.
 - Individuals are expected to regulate their emotion in interactions with all others.
 - Process of emotional labor includes the analysis and decision making around expressions of emotions, whether felt or not, as well as the suppression of emotions that are felt but not to be expressed.



Step 2: Design an Effective Frame for Interaction

- ❖ Interaction frames provide individuals with **ways of making sense** of a social situation
- ❖ **Frames, as the central organizing idea of an interaction...**
 - ❖ Filter our perceptions
 - ❖ Make some aspects of reality more visible
 - ❖ Enable some information to become more salient



Step 2: Design an Effective Frame for Interaction

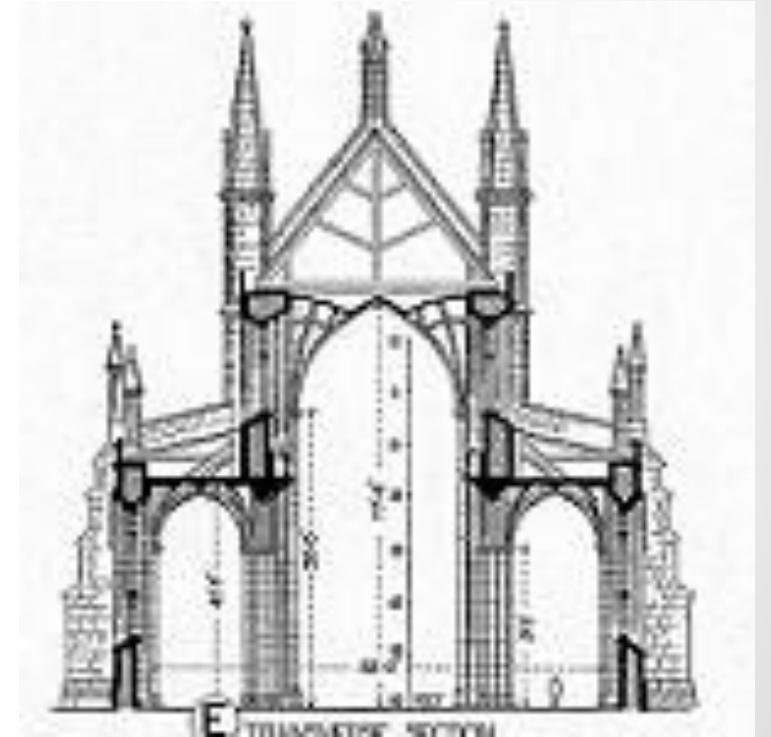
- Effective frames are robust, aligned with values of others and are relevant to their realities.
- Key questions to ask...
 - What kind of situation is this?
 - What outcome is required?
 - What does this interaction require of myself and others?



• (Goffman, 1974)

Step 2: The External Frame

- **GOAL: GET ON THE SAME PAGE**
- Construct the frame ahead of time
 - WHO?
 - WHERE?
 - WHEN?
 - WHY?
 - THE EXIT....
- Get explicit about context
 - Larger collective issues and goals
 - Environmental challenges and opportunities



Step 2: The Internal Frame

- **GOAL: STAY ON THE SAME PAGE**
- **Structure, structure, structure**
 - Agenda setting– expectations, goals, concerns, worries, time, process etc
 - Chunk and check – 1-3 sentences and then pause or ask for understanding before proceeding
 - Reflective listening – paraphrasing key words and phrases
 - Summarize to signpost and sustain flow
 - Action plans and next steps – follow up and confirm expectations



Step 2: Maintain Frame

Goal: Seek Perspective

- Choose your words and ask artful questions
- 2 eyes, 2 ears, 1 mouth rule – the body doesn't lie
- Listen for repetitions – they indicate core concerns
- Pay attention to interactional changes and adapt



Step 2: Seek Clarity

- Use non-judgmental language - Be SPECIFIC and DESCRIPTIVE
- Resist labels and interpretations – HESITATE and BE CURIOUS
- Structure feedback according to
 - Actual objective, observable and modifiable actions and words in context
- Use “WHEN” statements to discuss impact of behaviors in context
- Set careful and clear expectations around behavioral changes and timelines



Step 3: Conversation Floors, Turn taking and timing

- The speaker is the person who **holds the floor**.
- **Turn-taking** results in changes in who “holds the floor” and is signaled by pauses, intonation, and phrasing.
- Turn-taking is gender, age and culturally inflected.
- **Overlap** is when two people are on the floor at the same time.
- **Inadvertent interruptions** may occur when one speaker overlaps another causing a floor shift unintentionally.
- **Violative interruptions** occur when one speaker overlaps another with the intention of taking the floor. Such interruptions assert dominance and control over the conversation.



Hancock and Rubin (2014) –
Women interrupted men 1x and other women 2.8x. Men interrupted men 2x and women 2.6x

Step 3: Patterns and Moves



- **One- up, one-down and one-across**

- One-up = bid for power
- One-down = surrender power
- One-across = attempt to neutralize control

- **Complementary** = acts in a sequence are relationally opposite

- series of one-ups followed by one-downs

- **Spirals** - evolving patterns = actions intensify each other - competitive symmetry

- relational roles become extreme
- progressive and regressive spirals

Step 3: Remember Face!

- **Face (Goffman, 1955)** is a mask that changes depending on audience and variety of social interaction.
- People strive to maintain the face they have created in social situations and loss of face results in emotional pain.
- In social interactions, people cooperate to give and maintain face through politeness strategies.
- While strategies are culturally specific, the concept of face is universal as it relates to human dignity.



Step 4: Sustain dialogue



The following techniques are commonly used to silence or shut down dissent and dialogue:

- Disqualification – e.g. ‘you’re just a, what would you know?’
- Naturalization – e.g. ‘that’s just the way we do things around here.’
- Neutralization – e.g. ‘your evaluation is rated at 3.6’
- Topical Avoidance – e.g. ‘that is none of your business’
- Personalization of Experience – e.g. ‘well of course you would think that’
- Meaning and Plausibility Denial – e.g. ‘that’s not what I meant’
- Legitimation – e.g. ‘efficiency above all else’
- Pacification – e.g. ‘you don’t need to worry about that’

Step 4: Manage Chaos



This is what it looks like.....

- Step 1: Make an ambiguous statement
 - Step 2: Ignore any inconsistencies
 - Step 3: Make the ambiguity and inconsistencies undiscussable
 - Step 4: Make the fact you can't discuss it undiscussable
- To counter chaos, seek clarity and open doors:
 - Qualify contributors
 - Ask 'how did we end up with.....?'
 - Re-insert topics for discussion or return to them
 - Elicit and introduce the perspectives of others
 - Question words/phrases used – 'what do you mean by....?'
 - Open up discussions of other values –seek plurality and diversity
 - Resist pacification

Step 4: Monitor Boundaries

- When the frame of the interaction is threatened by your or another's behavior...
- 1. Stop
- 2. Rewind – go back to another time or topic
- 3. Reflect – mirror, think deeply or carefully about
- 4. Deflect – to bend, turn aside, swerve
- 5. Defer – postpone, commit or entrust to another

Fishbowl



Time for you to practice



Wrap-Up

- What worked?
- What didn't work?
- Why?





Closing

...

Identify at least one thing you will do differently as a result of today's session

NAVIGATING CHALLENGING INTERACTIONS

JULY 18, 2017

KIRSTEN BROADFOOT, PHD

1. Communication skills to structure a frame for challenging interactions

- **Agenda setting**– Set expectations, goals; Identify concerns, worries; Set time, process etc.
- **Chunk and check** – State 1-3 sentences and then pause or ask for understanding before proceeding
- **Reflective listening** – paraphrasing key words and phrases the other person stated
- **Summarize** to signpost where you want to take the conversation next and sustain flow
- **Action plans** and next steps – follow up and confirm expectations, generally follow up in writing

2. Communication skills to maintain interactional frames

- **Choose your words** and ask artful questions to elicit the core issues and their understanding
- **USE 2 eyes, 2 ears, 1 mouth rule**; the body doesn't lie- yours or theirs
- **Listen for repetitions** – they indicate core concerns
- Pay attention to **interactional changes** and adapt

3. Communication skills to manage chaos:

- **Qualify** contributors
- **Ask** 'how did we end up with...?'
- **Re-insert** topics for discussion or reintroduce them
- **Question** words/phrases used – 'what do you mean by...?'
- **Open up** discussions of other values and/or perspectives to seek plurality and diversity
- **Resist** pacification

4. Communication skills to monitor boundaries:

- **Stop**
- **Rewind**
- **Reflect**
- **Deflect**
- **Defer**

Workshops...



How to design and perform them for maximum impact

Dr. Angela Velez-Solic

Disclaimer



Participants must attend the entire session in order to earn contact hour credit. Verification of participation will be noted by learner initial/signature on the roster.

No commercial support has influenced the planning of the educational objectives or the content of this activity.

There is no endorsement of any product by the provider or RUMC associated with this activity.

Objectives

Participants will:

- Define 'workshop' and examine the differences between a presentation, talk, and workshop
- Explore effective practices for delivering memorable workshops
- Practice techniques that inspire workshop attendees





A close-up photograph of a person's hands using a pencil to draw on a technical drawing table. The background is blurred, showing some bokeh lights. The text 'Differences' is overlaid in white on the left side of the image.

Differences

Workshop

Talk

Presentation



Headline &
Description

Target Audience

Place and Space

Prepare!

When it begins

- ❑ Get to know the group
- ❑ Make them feel comfortable
- ❑ Be relatable
- ❑ Be authentic
- ❑ Show enthusiasm
- ❑ RELAX!



Other behaviors



- ❑ Get their attention and keep it
- ❑ Encourage open dialogue
- ❑ Use shock, insight, humor
- ❑ Self-deprecation helps sometimes
- ❑ Know your subject- DO NOT READ SLIDES!
- ❑ Be aware of body language
- ❑ Eye contact
- ❑ Tell lots of stories!
- ❑ Use plenty of visuals (infographics/charts)
- ❑ Build in some repetition

Engagement Ideas

Today'smeet.com
(backchannel chat)

Polleverywhere.com

Clickers

Kahoot.com



The “work” part of the “shop”

Plan ahead

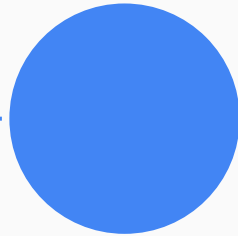
Use small groups- 3 people (ish)

Relatable activity



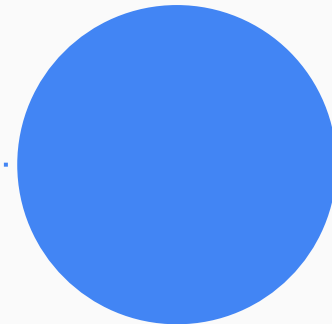
Get them moving

Partner with people they do not know



Share

Have a deliverable that can be shared





Let's Practice

Our Workshop

Subject: Professional Behavior in
Healthcare careers

1. Snazzy title & description
2. Objectives (value), room, & space
3. Idea for introductions
4. Story ideas
5. Activity/Deliverable?
6. Visuals
7. How can you help them remember?

1. Savoir-faire of the savvy professional: Do you have it?
2. Pathways to pearls of professionalism
3. Bringing what you learned in kindergarten to the bedside
4. Oh no you didn't: Maintaining professionalism in healthcare workplaces
5. The good, the bad and the ugly: using teamwork to make the dream work

The Super Savvy Title Competition

Kudos to #4 for the slight edge over the others!

What else?

The Neuroscience of Substance Abuse: From Experimentation to Addiction

T. Celeste Napier, Ph.D.

**Professor, Department of Psychiatry
Director, Center for Compulsive Behavior and Addiction
Rush University Medical Center, Chicago IL**



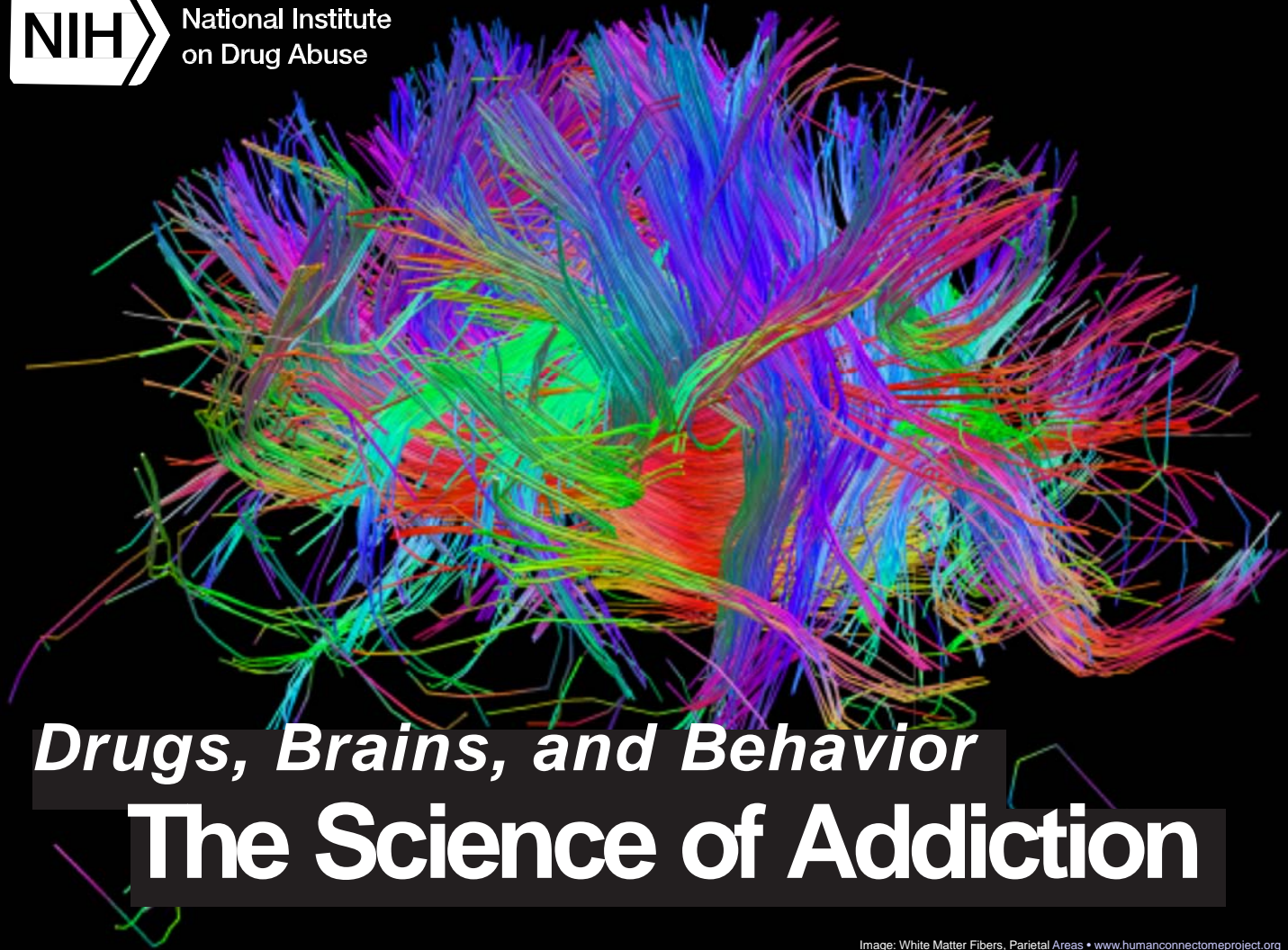
Comparison of Disease Prevalence in the US

- **1 million adults have Parkinson's disease**
http://www.pdf.org/parkinson_statistics
- **5.5 million adults have Alzheimer's disease**
http://www.alz.org/documents_custom/2017-facts2017_infographic.pdf
- **16.1 million adults had at least one major depressive episode in 2015**
<https://www.nimh.nih.gov/health/statistics/prevalence/major-depression-among-adults.shtml>
- **~116 million adults exhibit signs of an addiction disorder**
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3134413/>





National Institute
on Drug Abuse

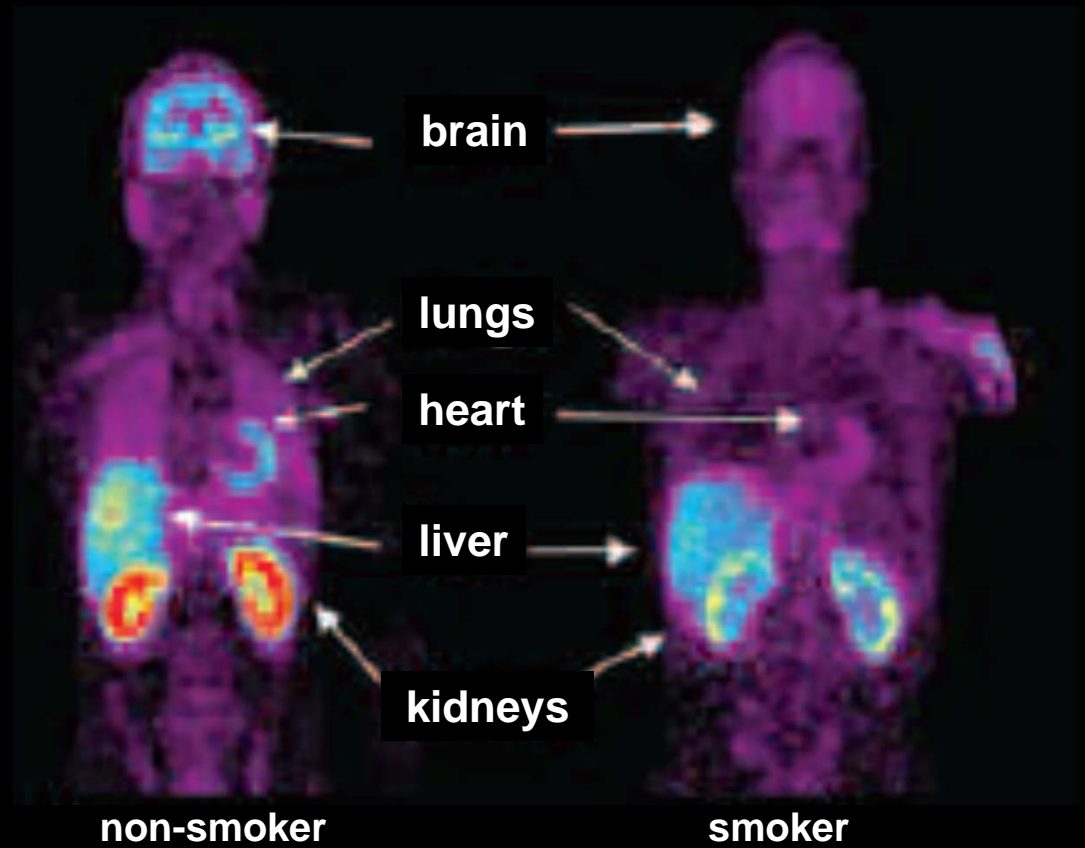


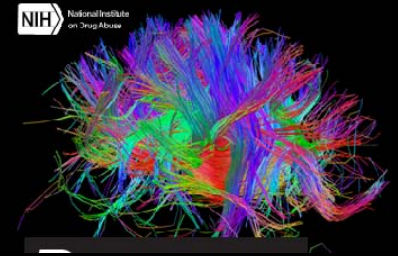
Drugs, Brains, and Behavior
The Science of Addiction

Image: White Matter Fibers, Parietal Areas • www.humanconnectomeproject.org

THE IMPACT OF ADDICTION CAN BE FAR-REACHING

- Cardiovascular disease
- Stroke
- Cancer
- HIV/AIDS
- Hepatitis B and C
- Lung disease
- Mental disorders

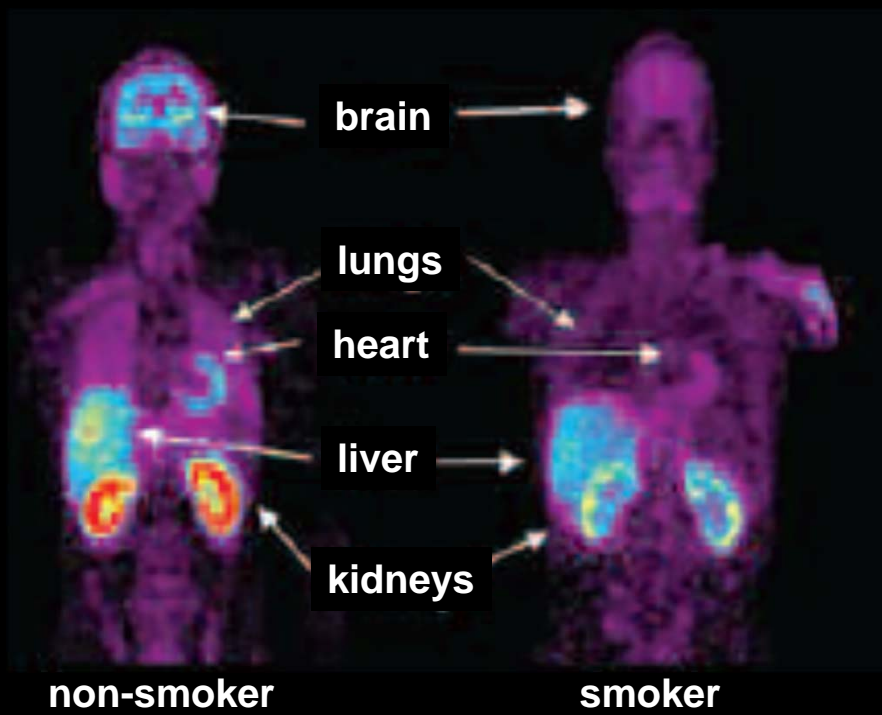




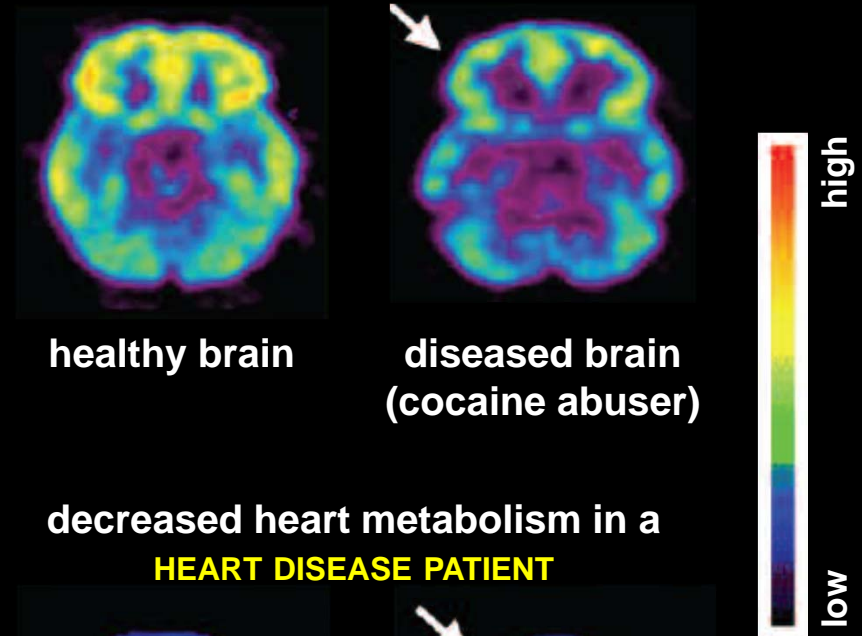
What is drug addiction?

“Addiction is defined as a **chronic, relapsing brain disease** that is characterized by compulsive drug seeking and use, despite harmful consequences.”

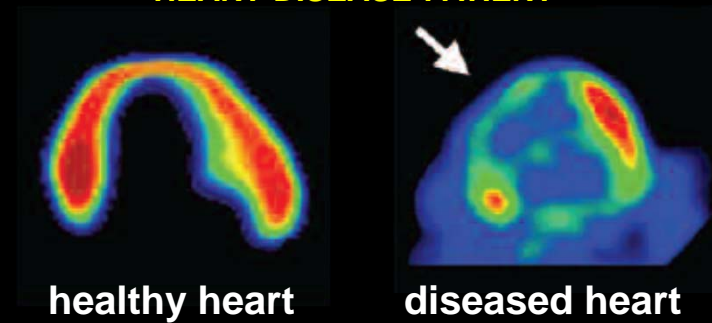
“It is considered a **brain disease** because drugs change the brain—they change its structure and how it works. These brain changes can be long lasting, and can lead to the harmful behaviors seen in people who abuse drugs.”



decreased brain metabolism in a
PERSON WHO ABUSES DRUGS



decreased heart metabolism in a
HEART DISEASE PATIENT



Key Points

- Neuroscience of Addictions
- Transitions in the Addiction Process
- Translational Research

In 2013, DSM-5 combined what was previously conceptualized as two separate and hierarchical disorders (substance abuse and substance dependence) into one construct, defining substance use disorders on a range from mild to moderate to severe, with the severity of an addiction depending on how many of the established criteria apply.



Why Do People Take Drugs in The First Place?

To feel
good

To have new:
feelings
sensations
experiences
and
to share them

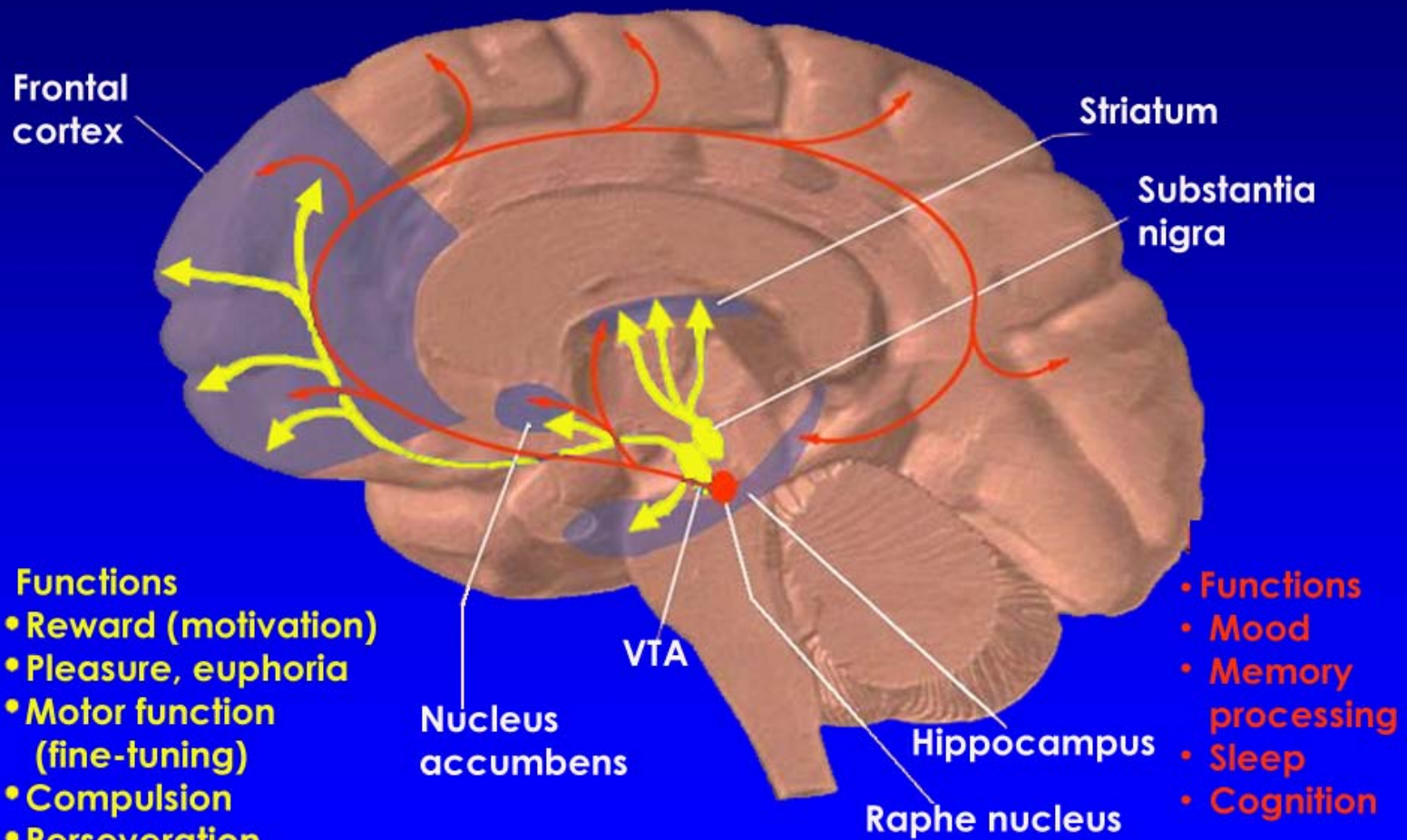


To feel
better

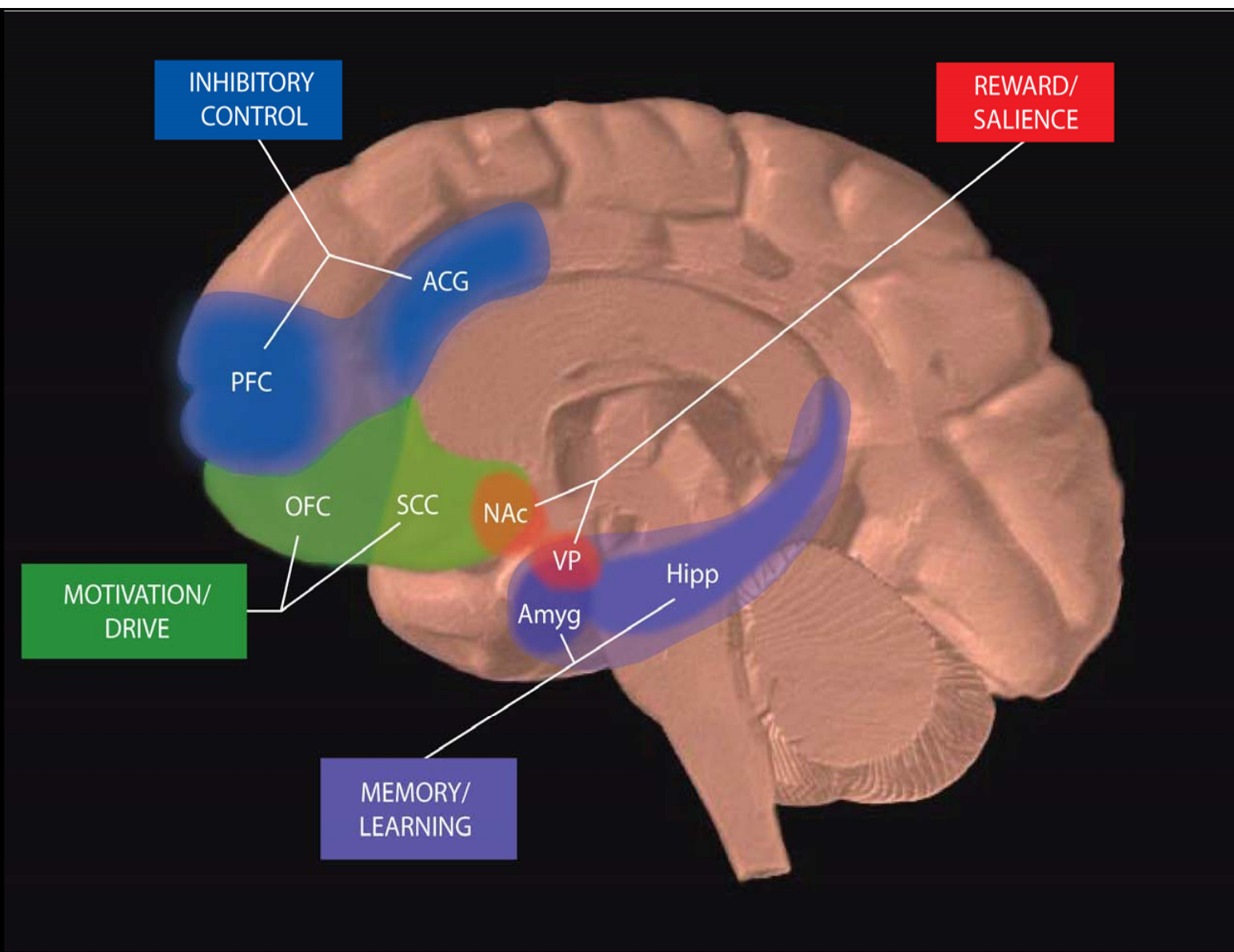
To lessen:
anxiety
worries
fears
depression
hopelessness
pain

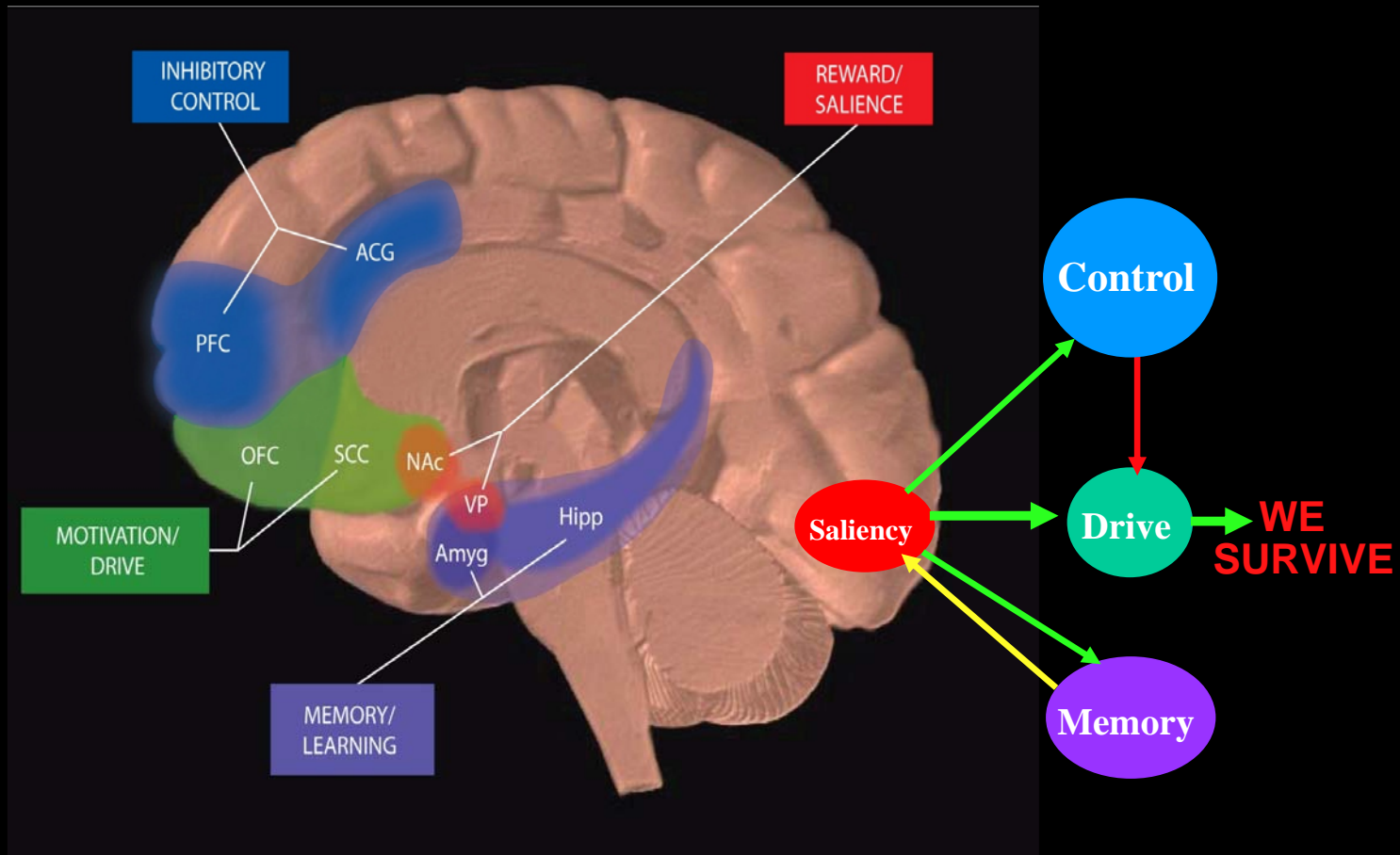
Dopamine Pathways

Serotonin Pathways



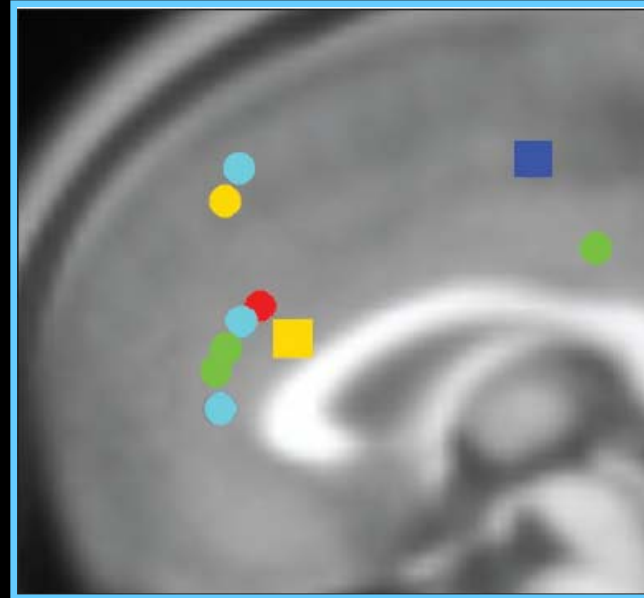
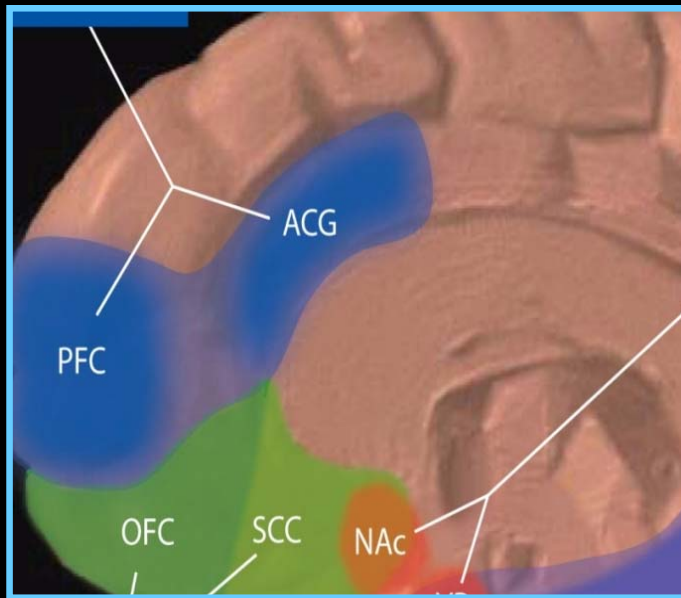
NIDA





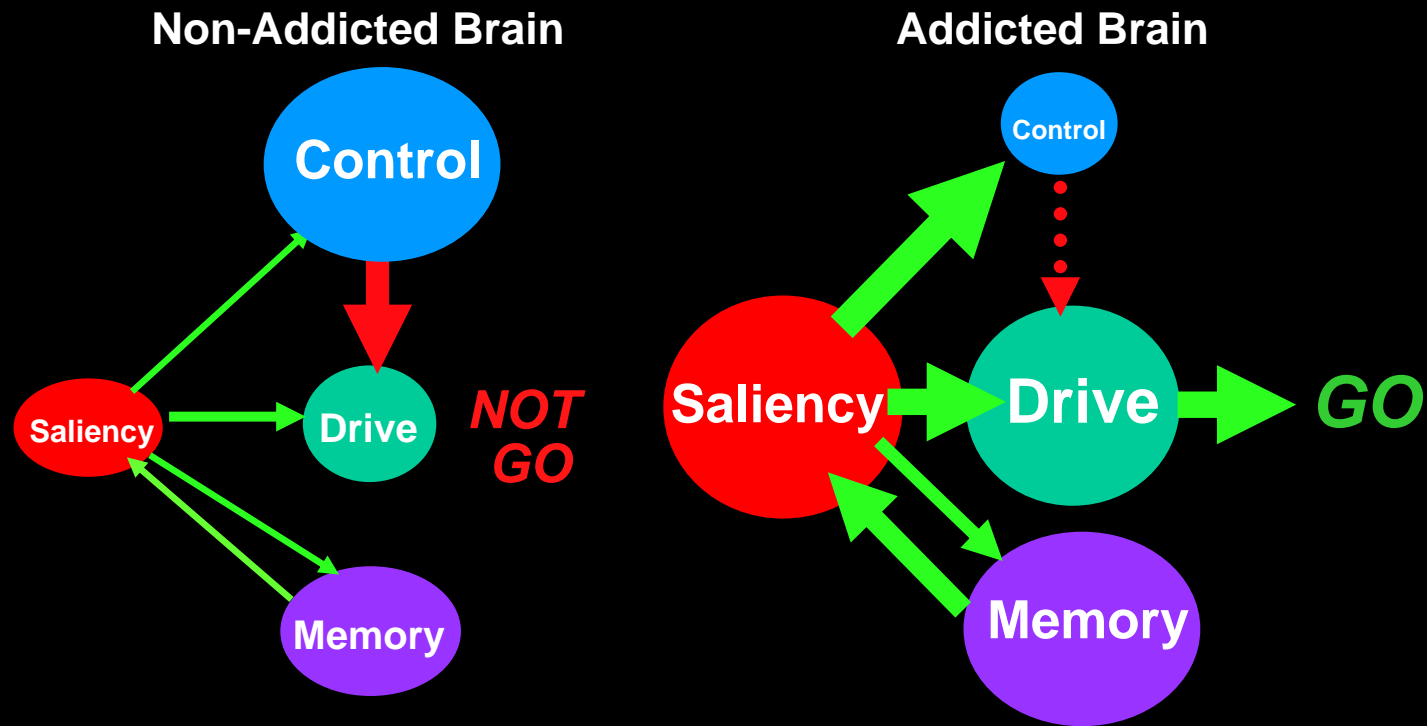
Adapted from Volkow et al., Neuropharmacology, 2004

Inhibitory Control: Drug and Behavioral Addictions



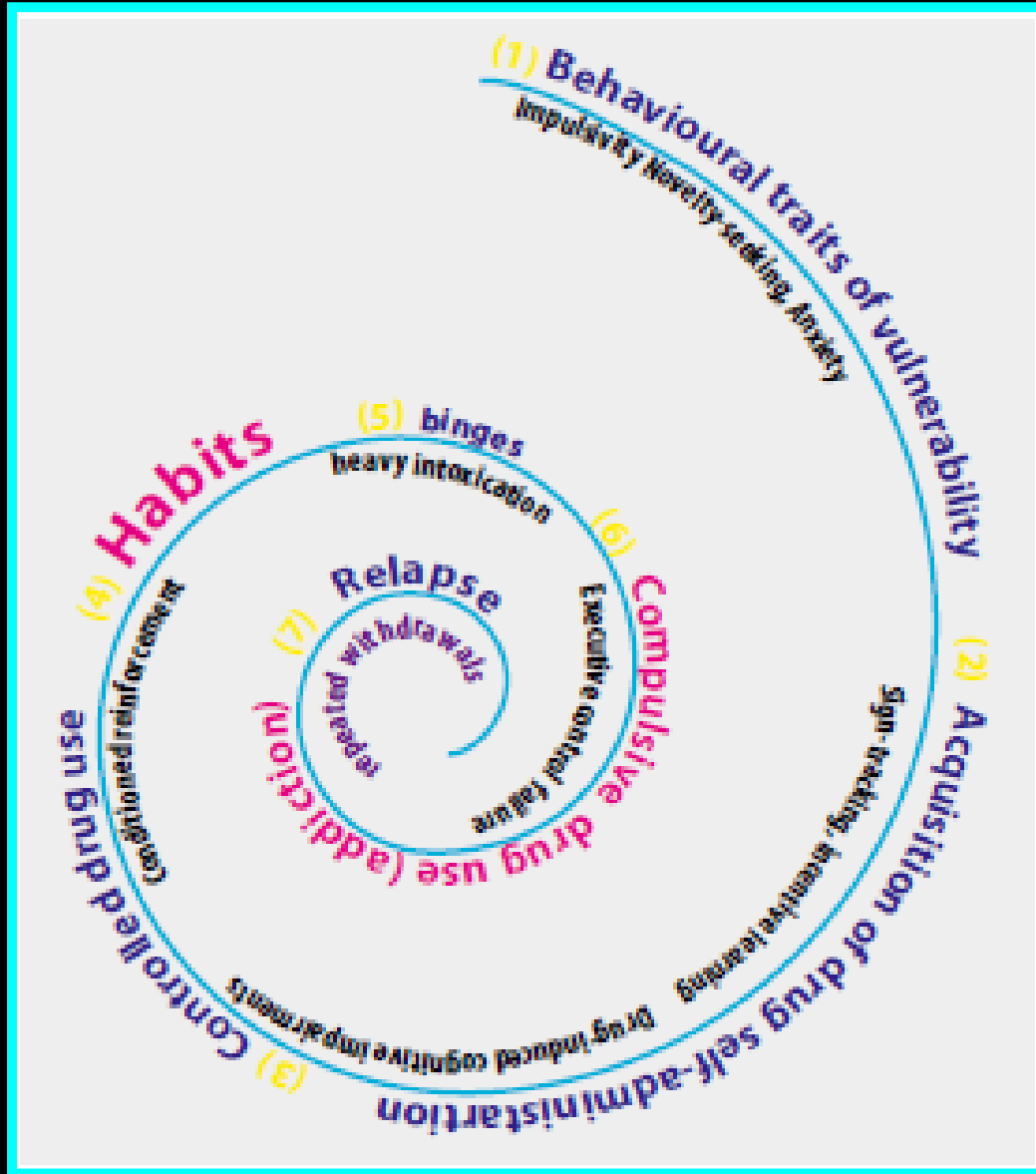
Luijten et al.,
J Psychiatry Neurosci, 2014

Addiction Changes Brain Circuits that Govern Decisions



Adapted from Volkow et al., Neuropharmacology, 2004

The Addiction Process



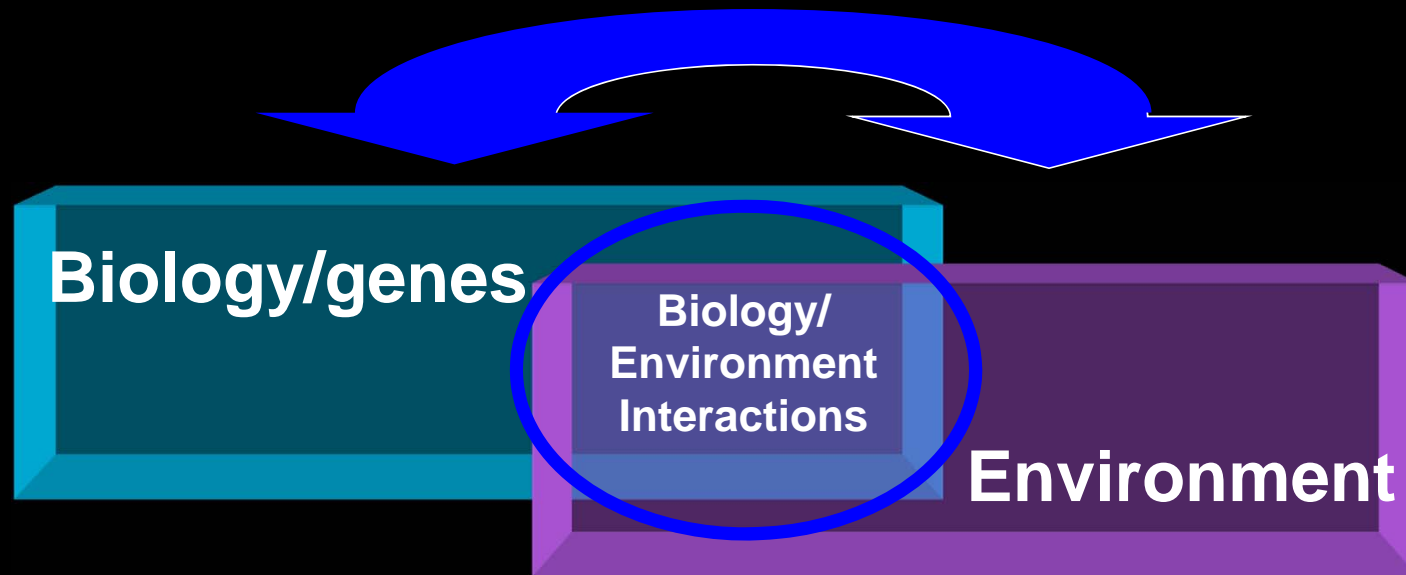
Everitt
Eur J Neurosci
40:2163, 2014.

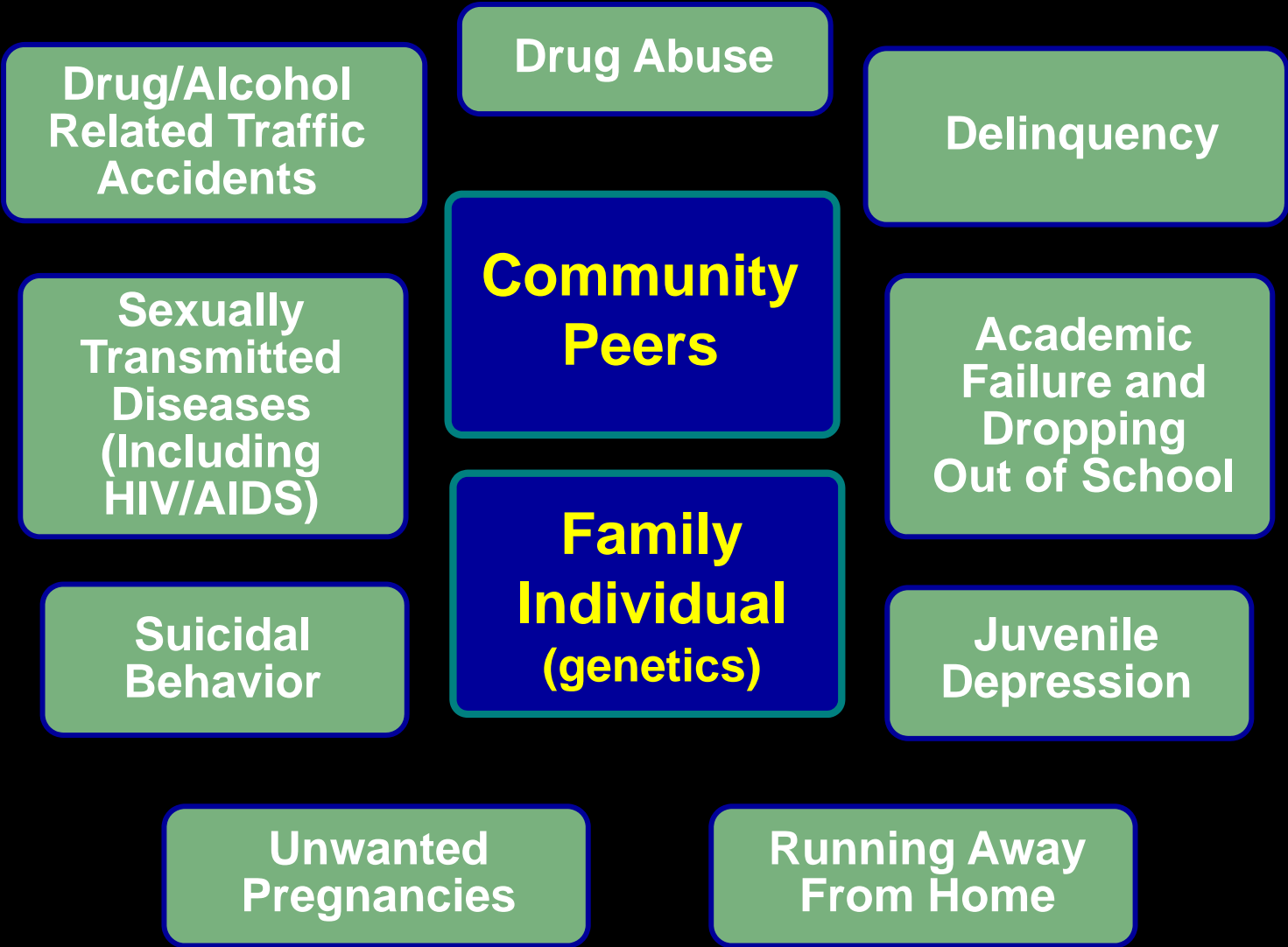
The Addiction Process

1. Vulnerability

Everitt
Eur Jr Neurosci
40:2163, 2014.

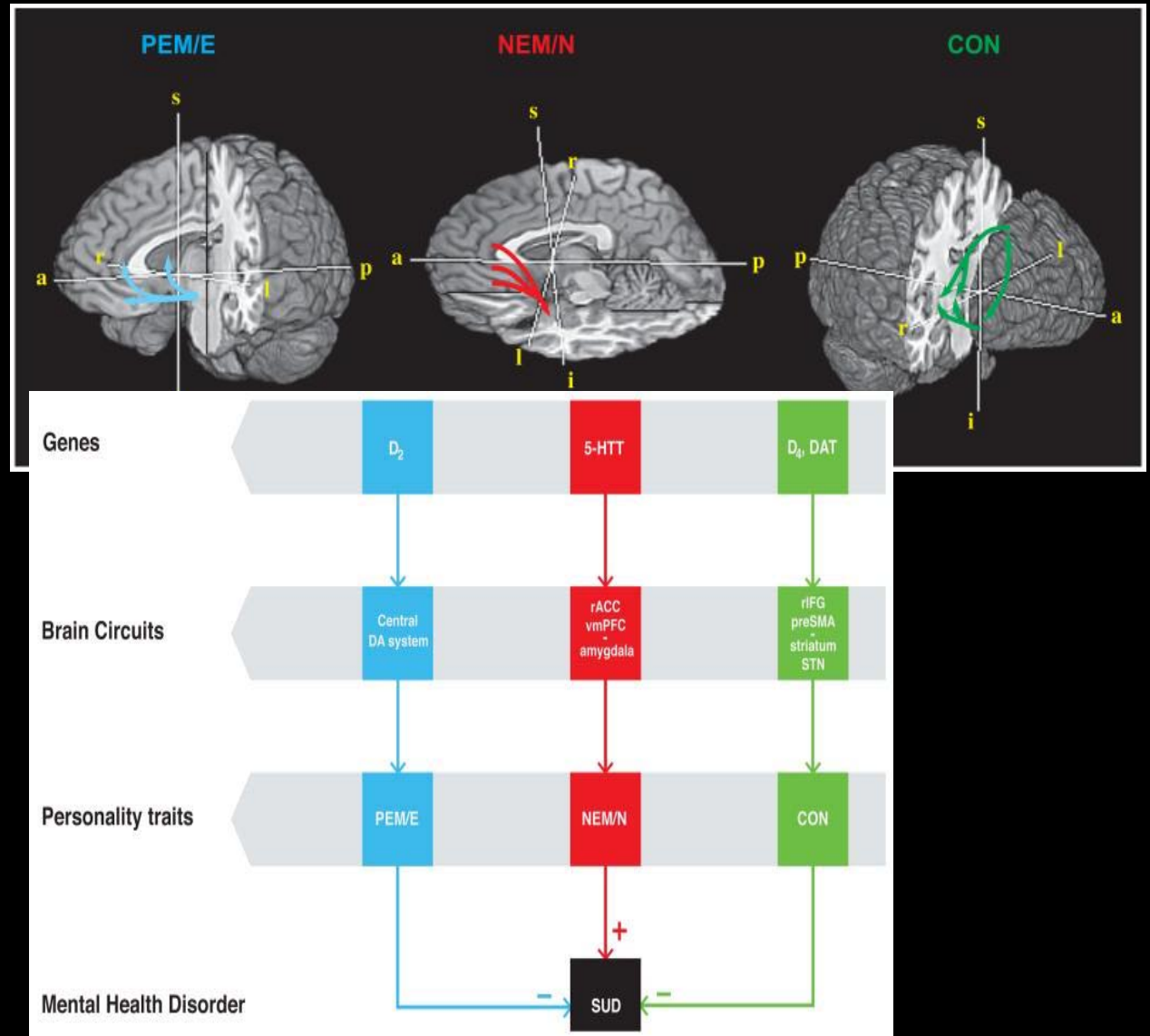






Personality traits and vulnerability or resilience to substance use disorders

Belcher *et al*
Trends Cogn Neurosci 18, 2014



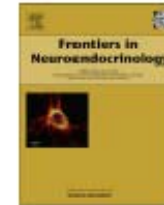


ELSEVIER

Contents lists available at [ScienceDirect](#)

Frontiers in Neuroendocrinology

journal homepage: www.elsevier.com/locate/yfrne



Review

Puberty and adolescence as a time of vulnerability to stressors that alter neurobehavioral processes



Mary K. Holder ¹, Jeffrey D. Blaustein ^{*,1}

“Puberty and adolescence are major life transitions ... complex or compound stressors during puberty and adolescence generally increases stress reactivity, increases anxiety and depression, and decreases cognitive performance in adulthood. These behavioral changes correlate with ... alterations in neural plasticity”

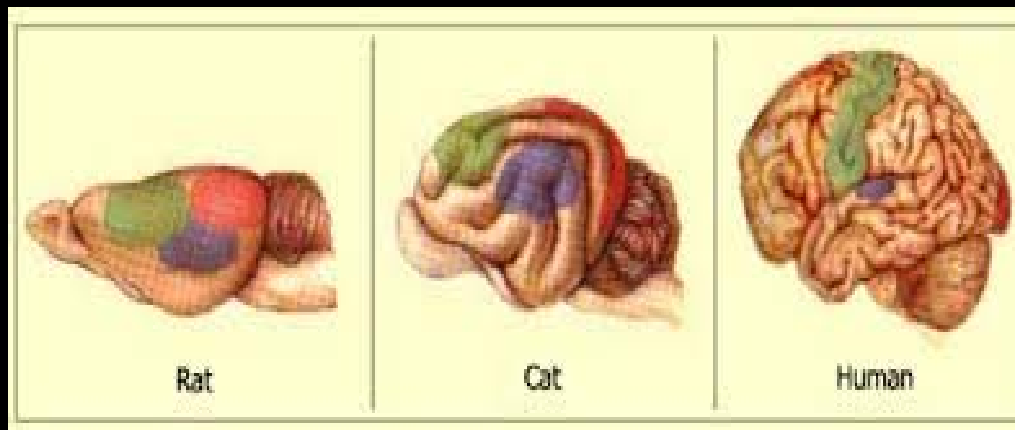
Everitt
Eur Jr Neurosci
40:2163, 2014.

The Addiction Process

2. Acquisition



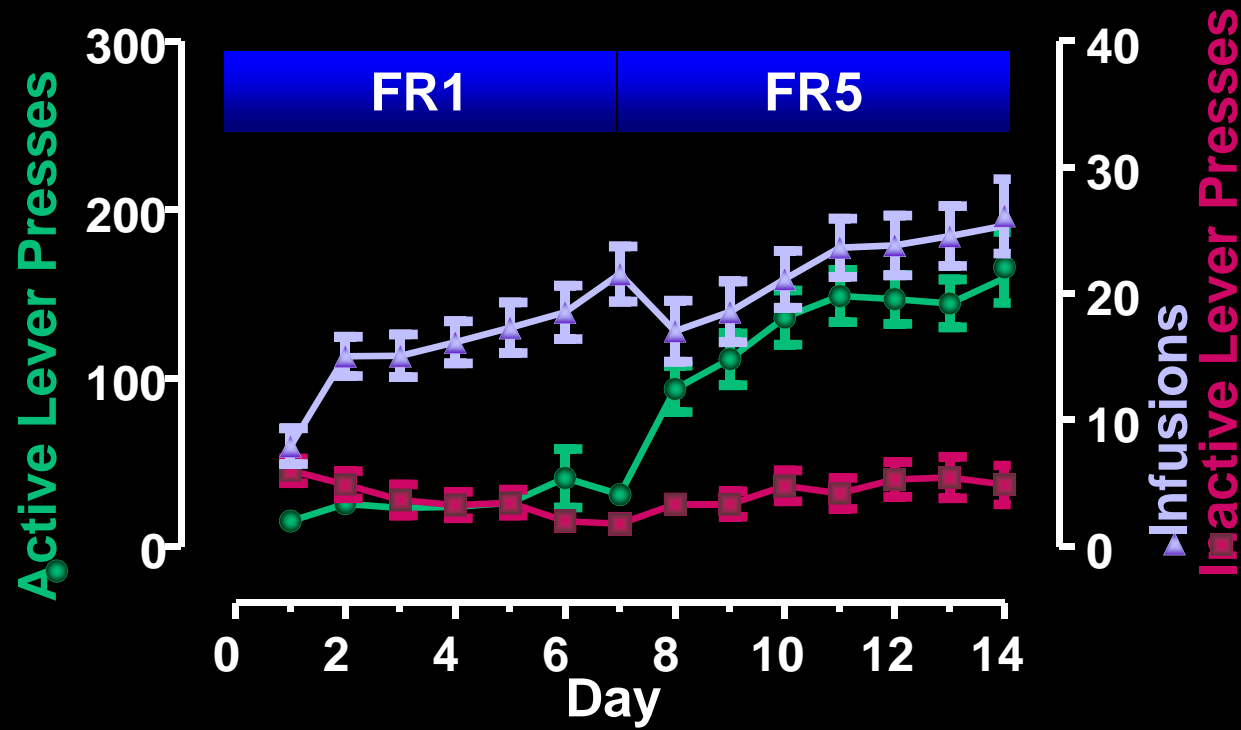
Comparative Functional Neuroanatomy

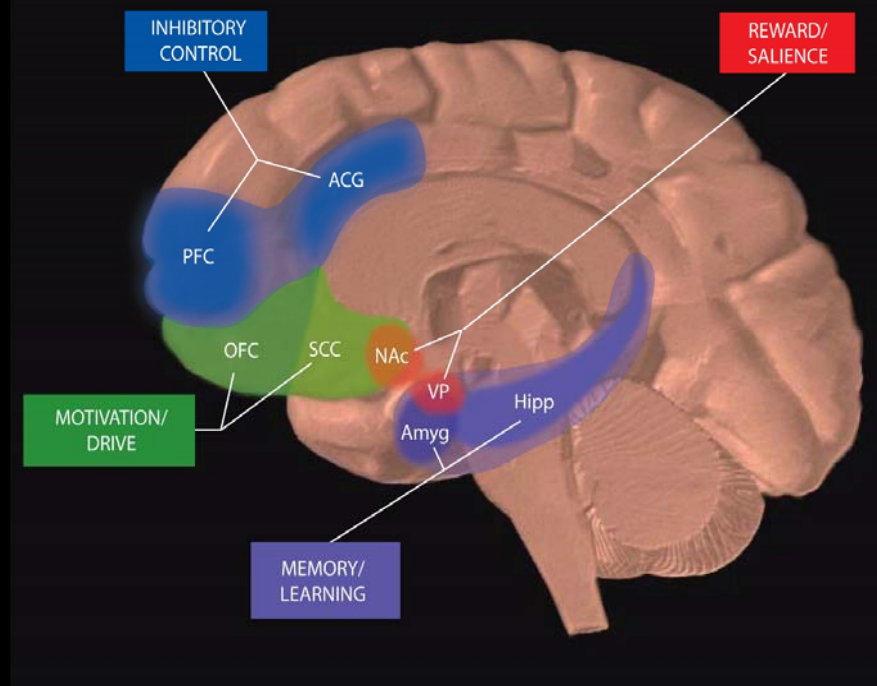
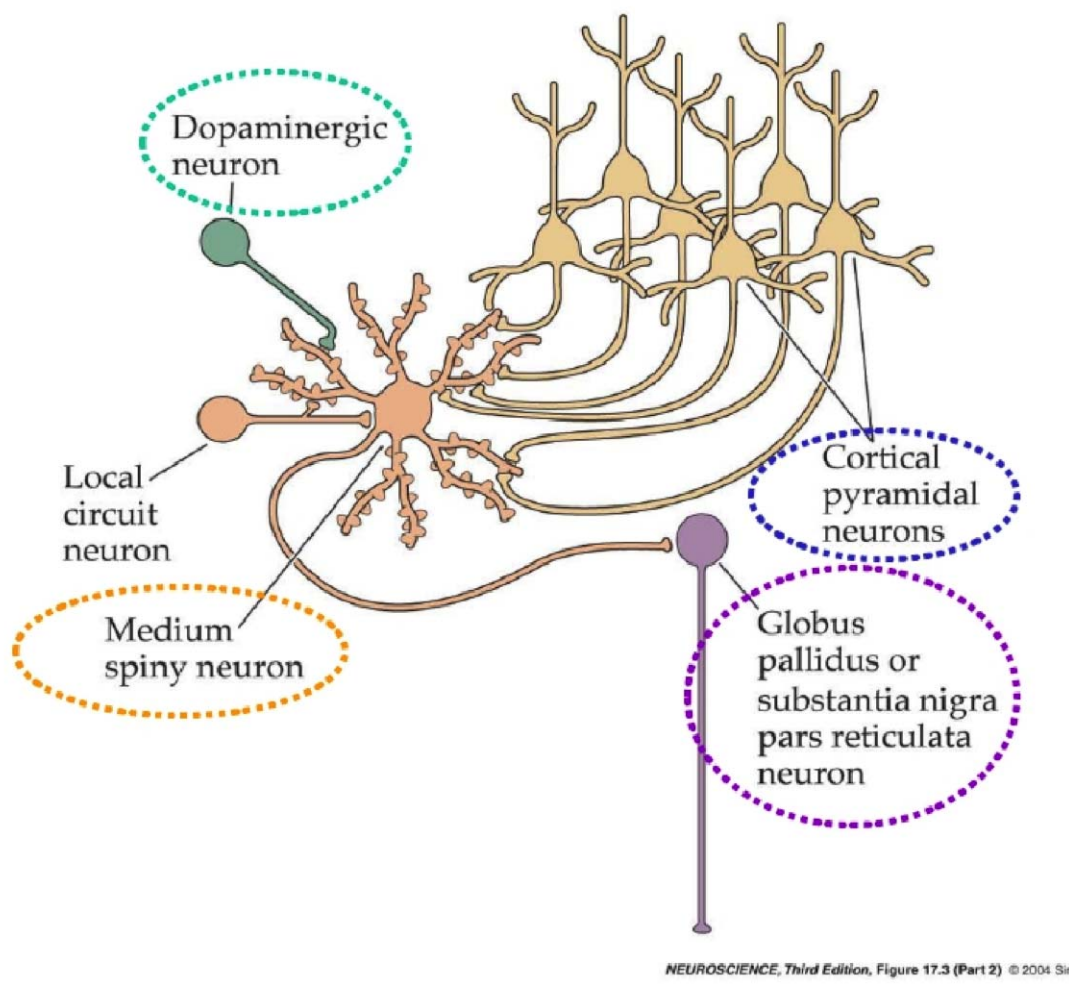


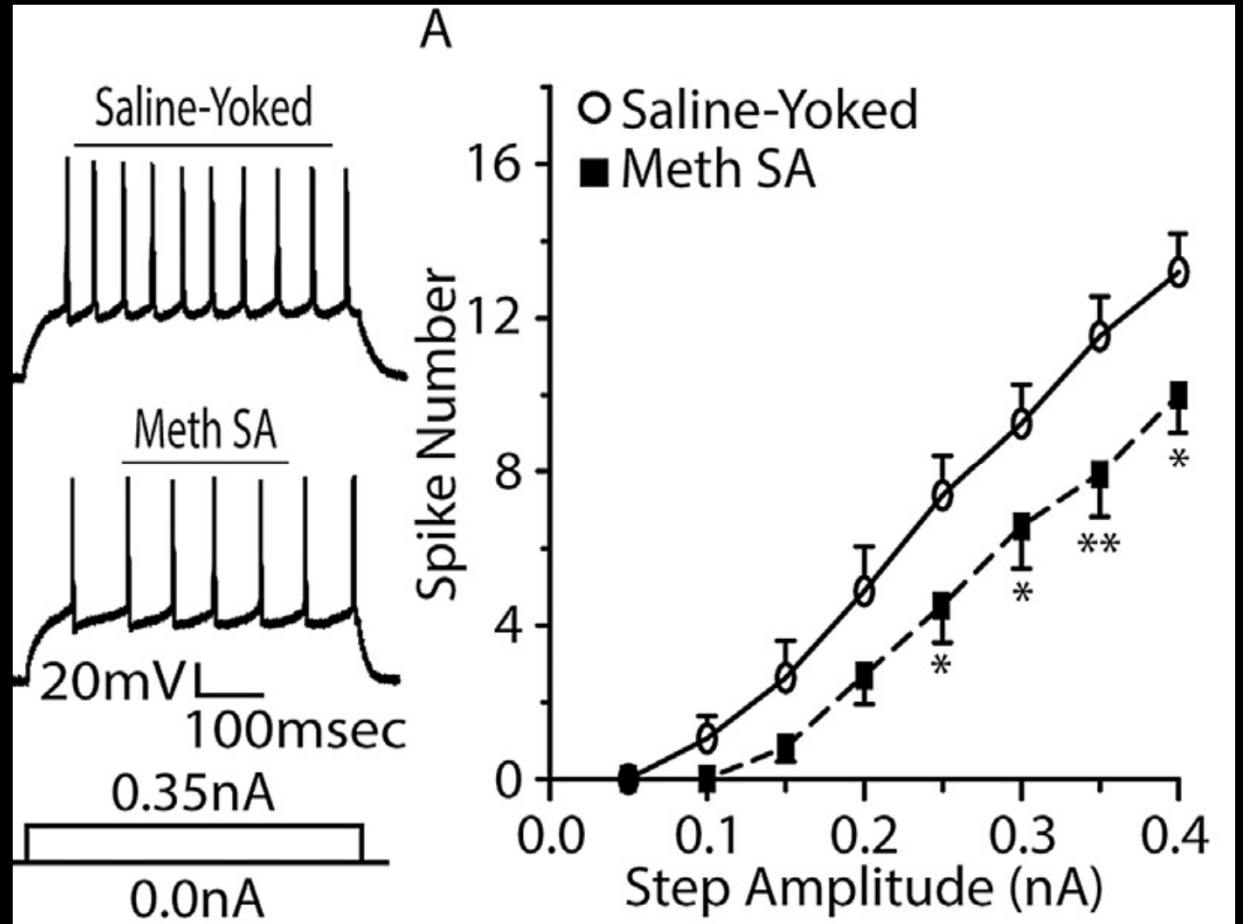
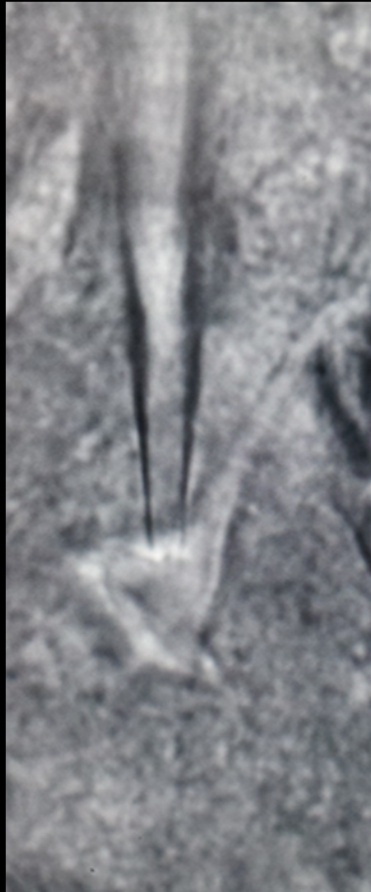
Self-Administration



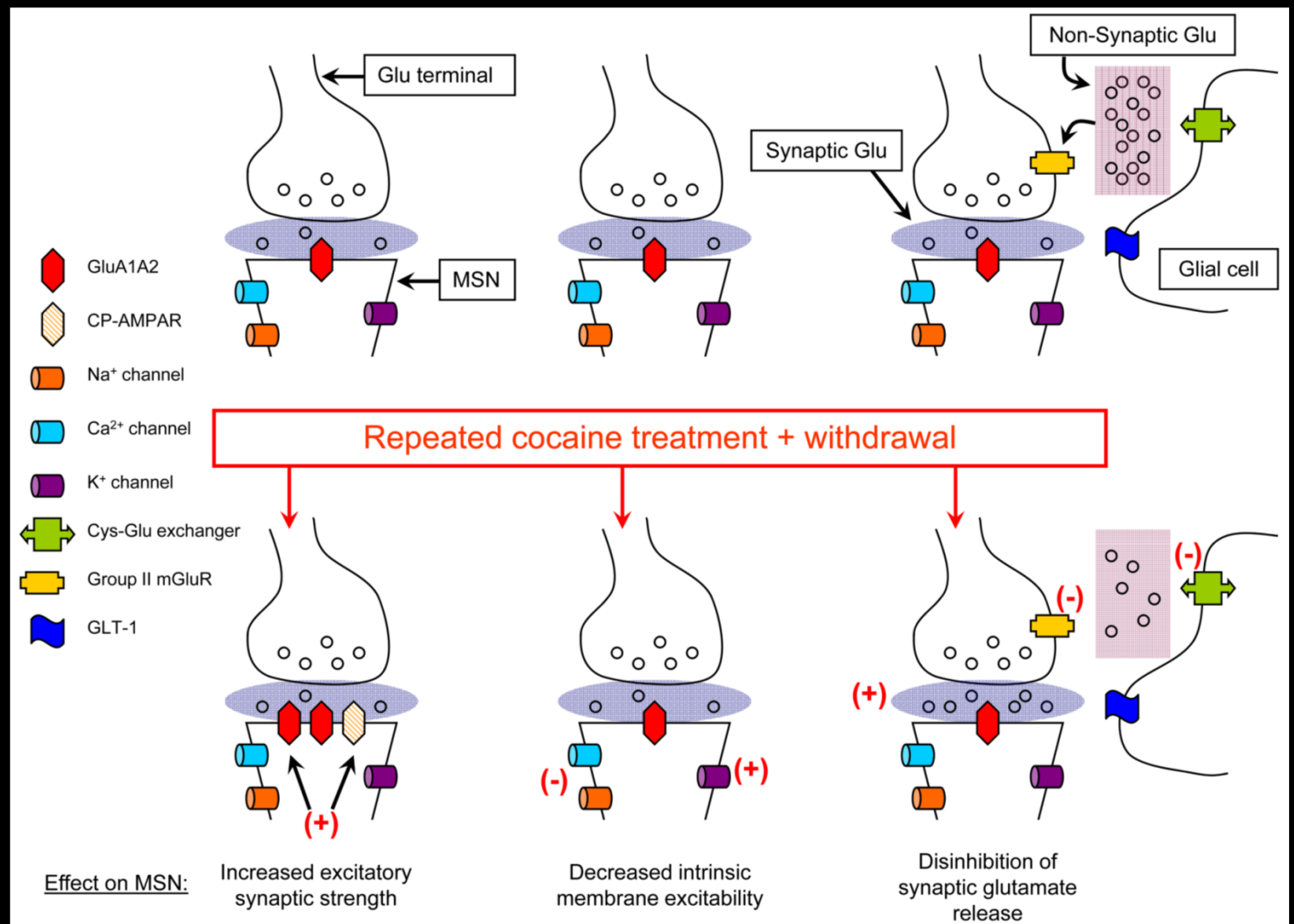
Meth Self-Administration







Graves et al.,
Neuropharm 2015



Nature Reviews Neuroscience

PERSPECTIVES

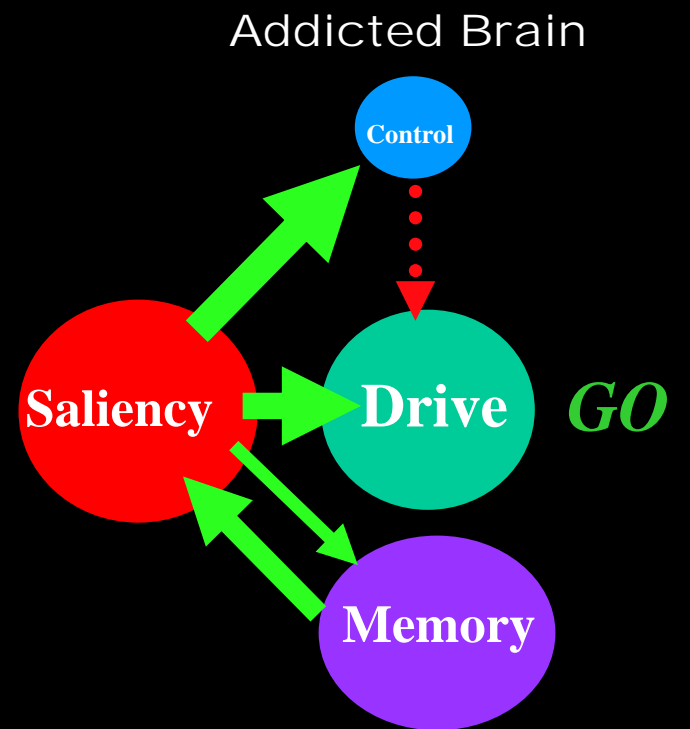
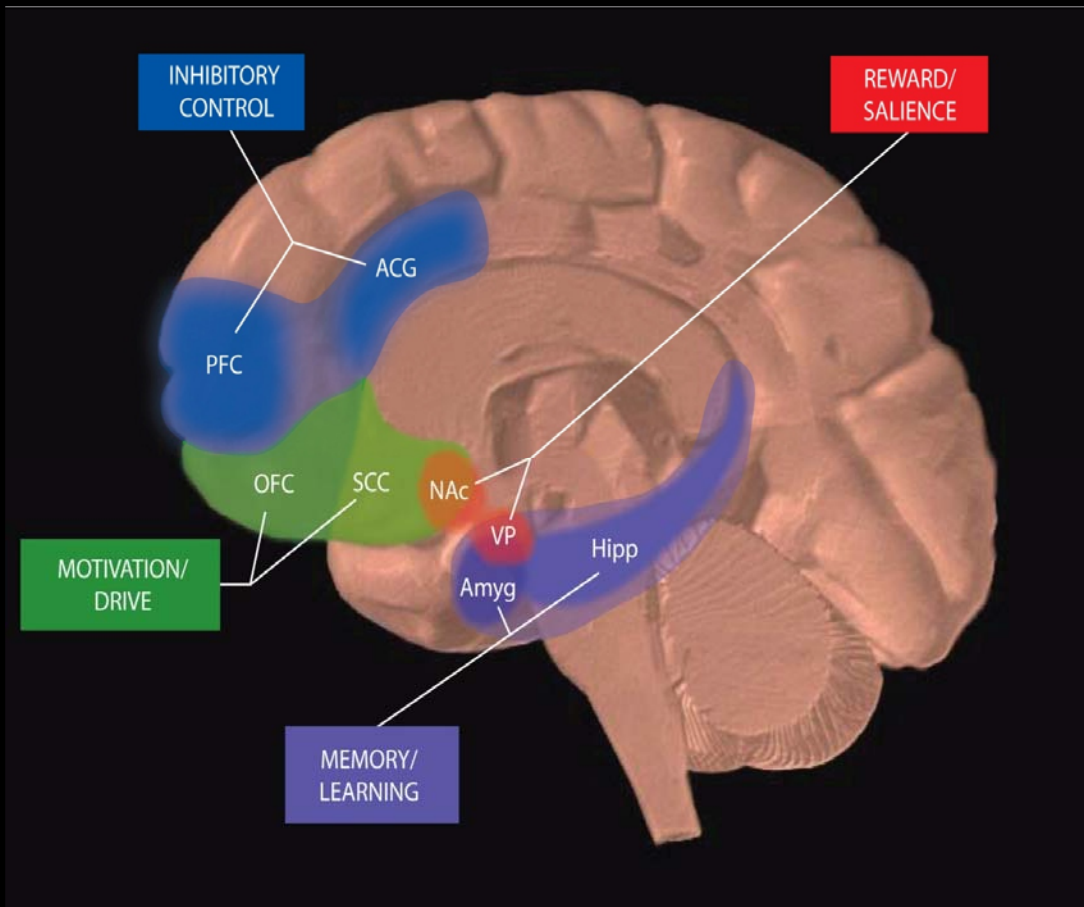
OPINION

Intrinsic plasticity: an emerging player in addiction

Saïd Kourrich, Donna J. Calu and Antonello Bonci

Abstract | Exposure to drugs of abuse, such as cocaine, leads to plastic changes in the activity of brain circuits, and a prevailing view is that these changes play a part in drug addiction. Notably, there has been intense focus on drug-induced changes in synaptic excitability and much less attention on intrinsic excitability factors (that is, excitability factors that are remote from the synapse). Accumulating evidence now suggests that intrinsic factors such as K⁺ channels are not only altered by cocaine but may also contribute to the shaping of the addiction phenotype.

Volume 16, MARCH 2015



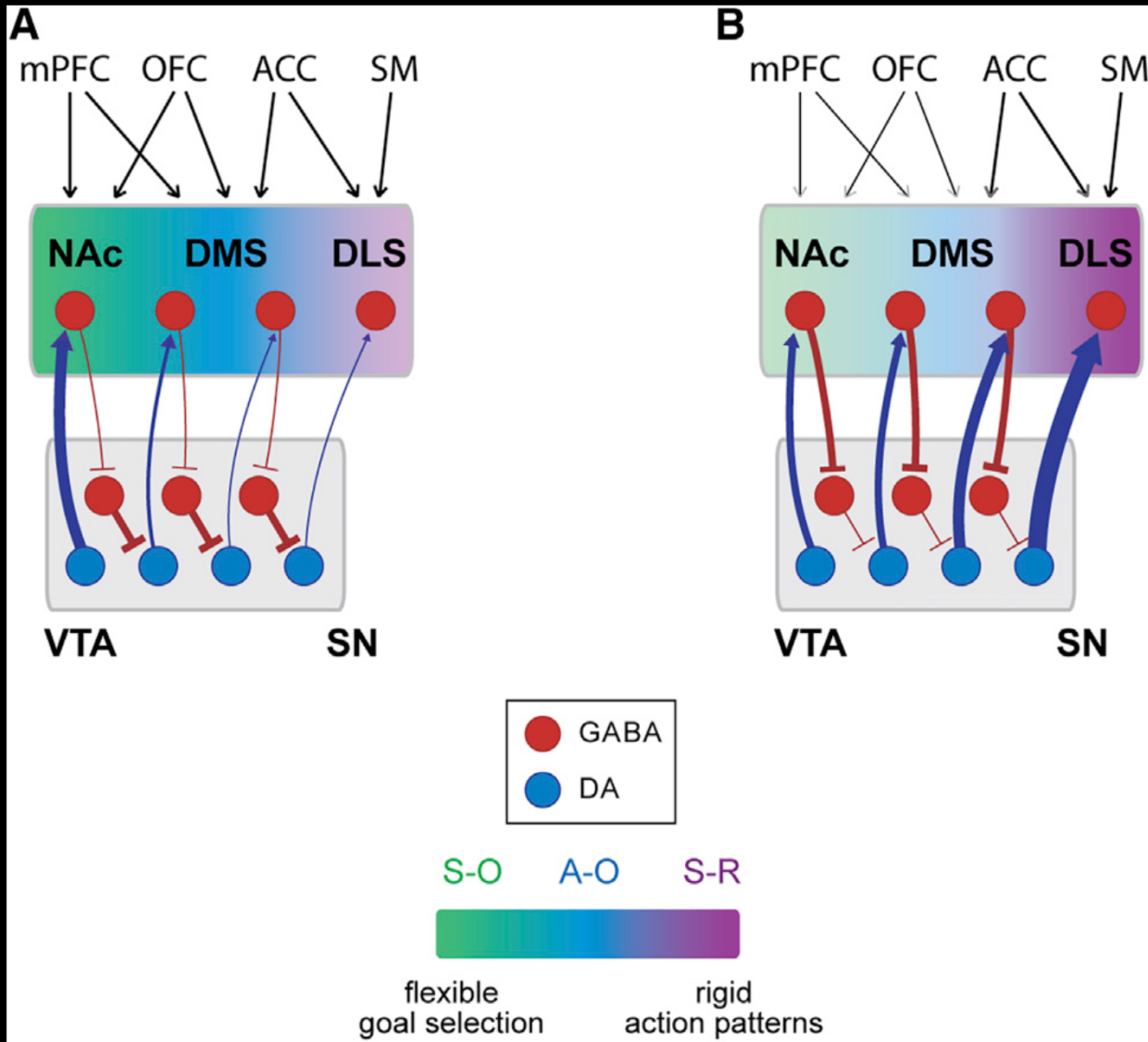
Adapted from Volkow et al., Neuropharmacology, 2004

The Addiction Process

3. Habits, Compulsion

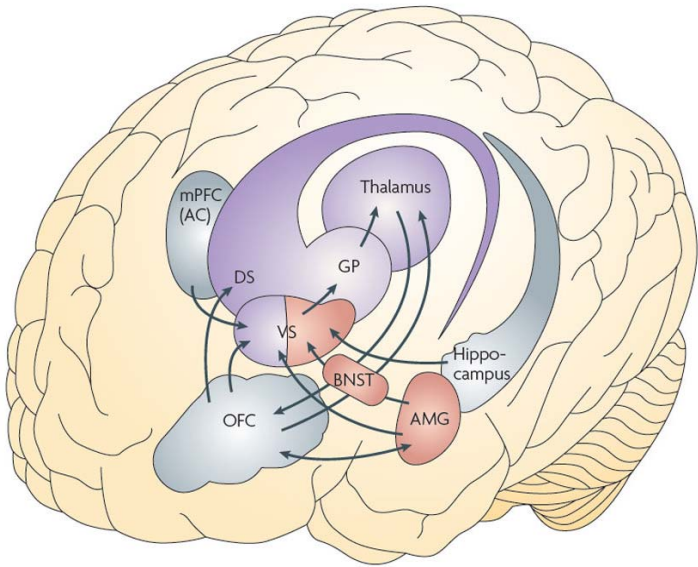
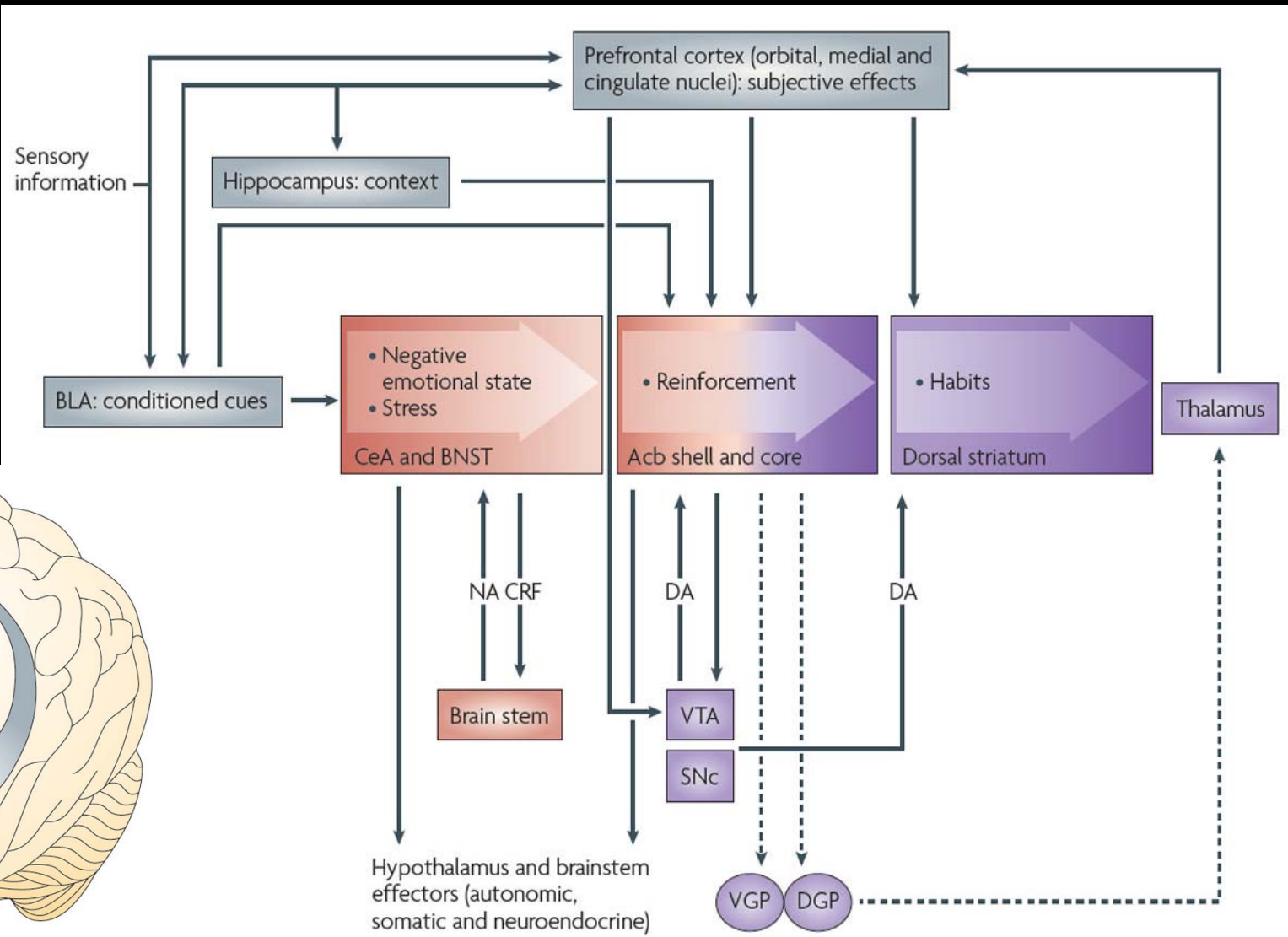
Everitt
Eur Jr Neurosci
40:2163, 2014.





Keiflin and Janak
Neuron 2016

*Koob et al.,
Nat Rev Drug Discov.
8:500–515,2009.*



The Addiction Process

4. Relapse

Everitt
Eur J Neurosci
40:2163, 2014.

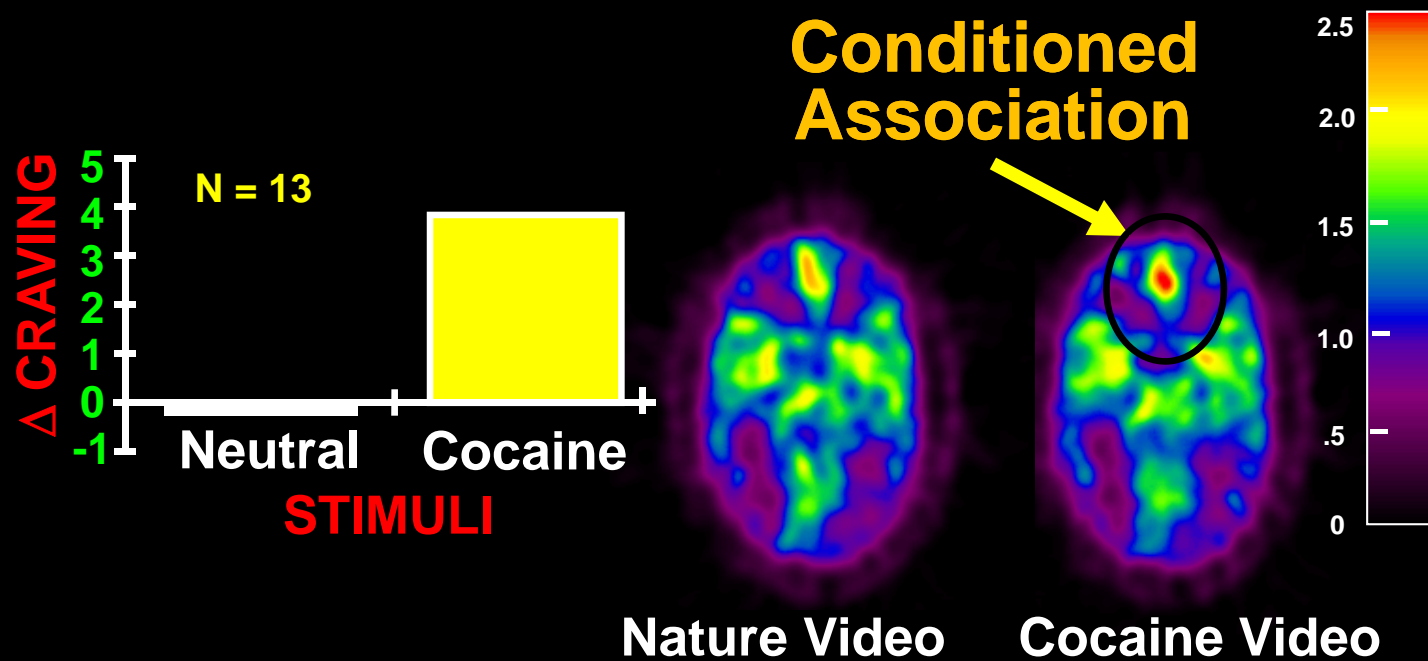


Memories Comprise a Critical Part of Addiction

It's about people, places, and things.



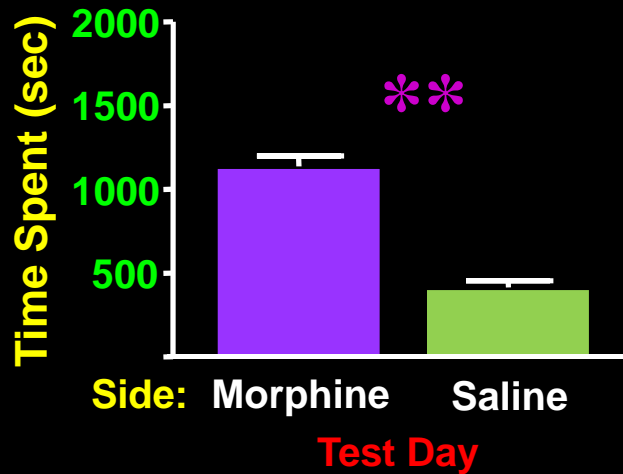
Addiction: it's about people, places and things ...



Childress et al., Am. J. Psychiatry, 1999

Addiction; it's about people, places and things

Associative learning: Conditioned Place Preference



Pretest:
No Treatment



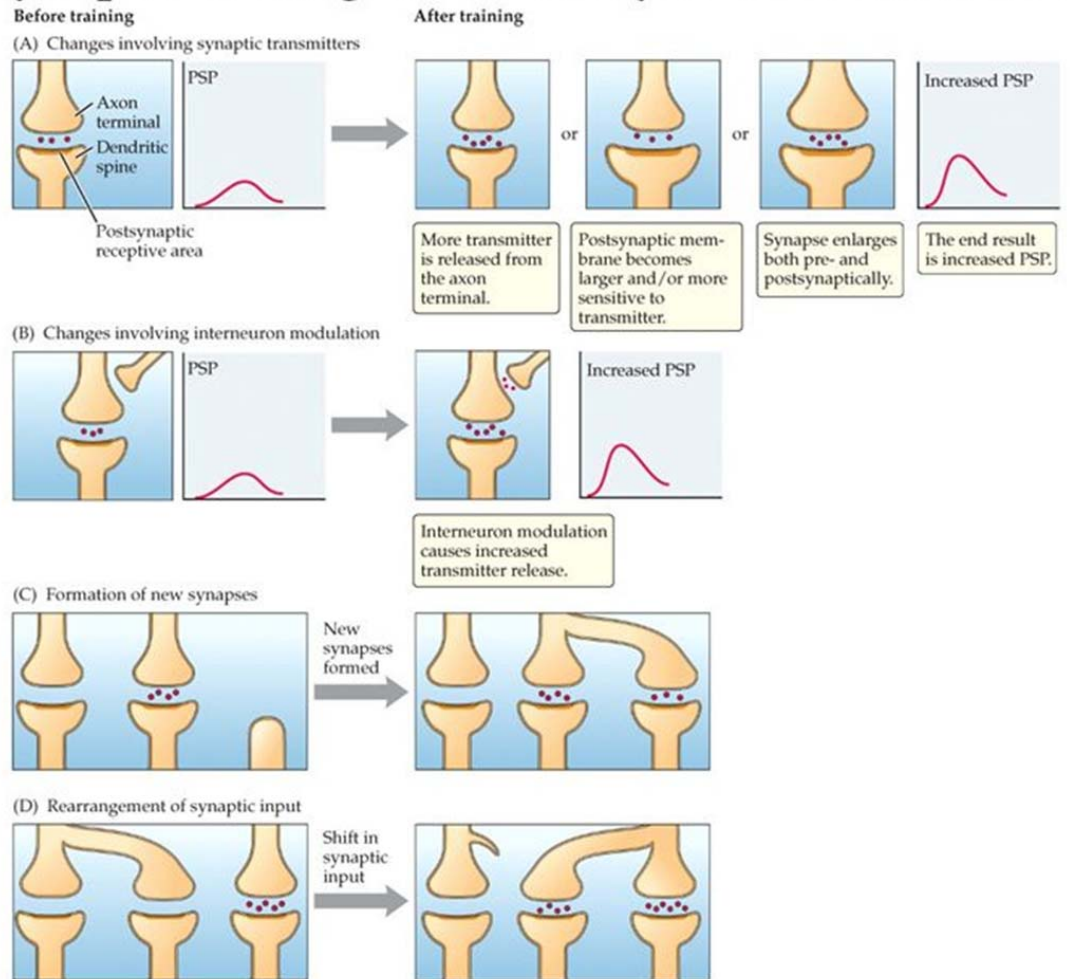
Conditioning:
Morphine vs Saline



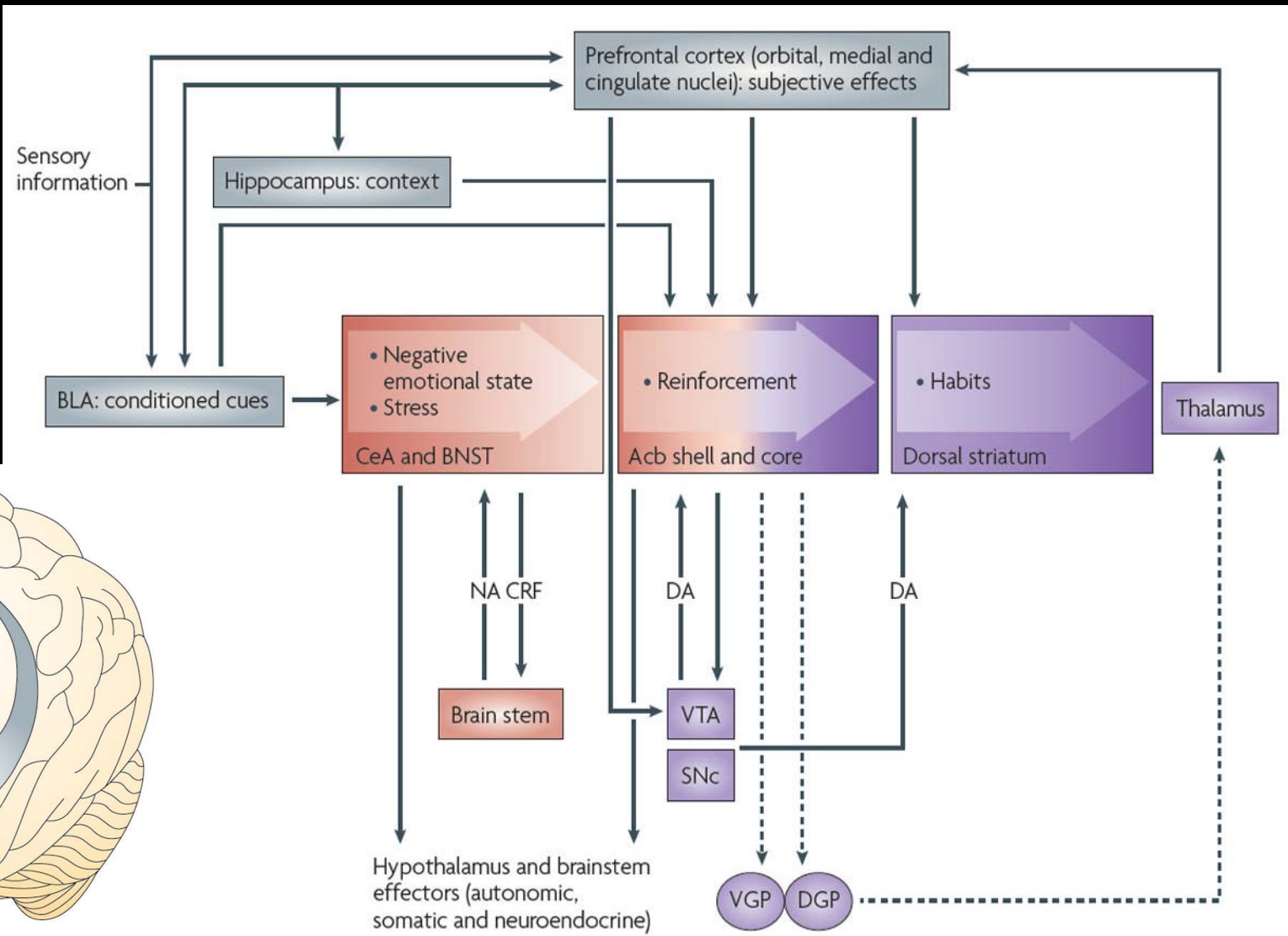
Test Day:
No Treatment



Synaptic Changes That May Store Memories



*Koob et al.,
Nat Rev Drug Discov.
8:500–515,2009.*



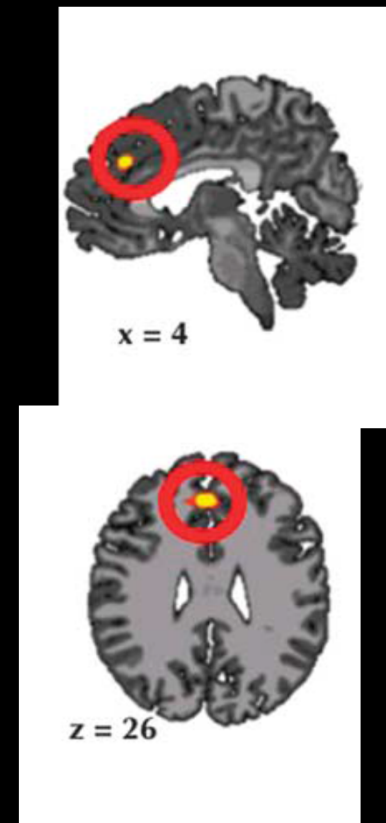
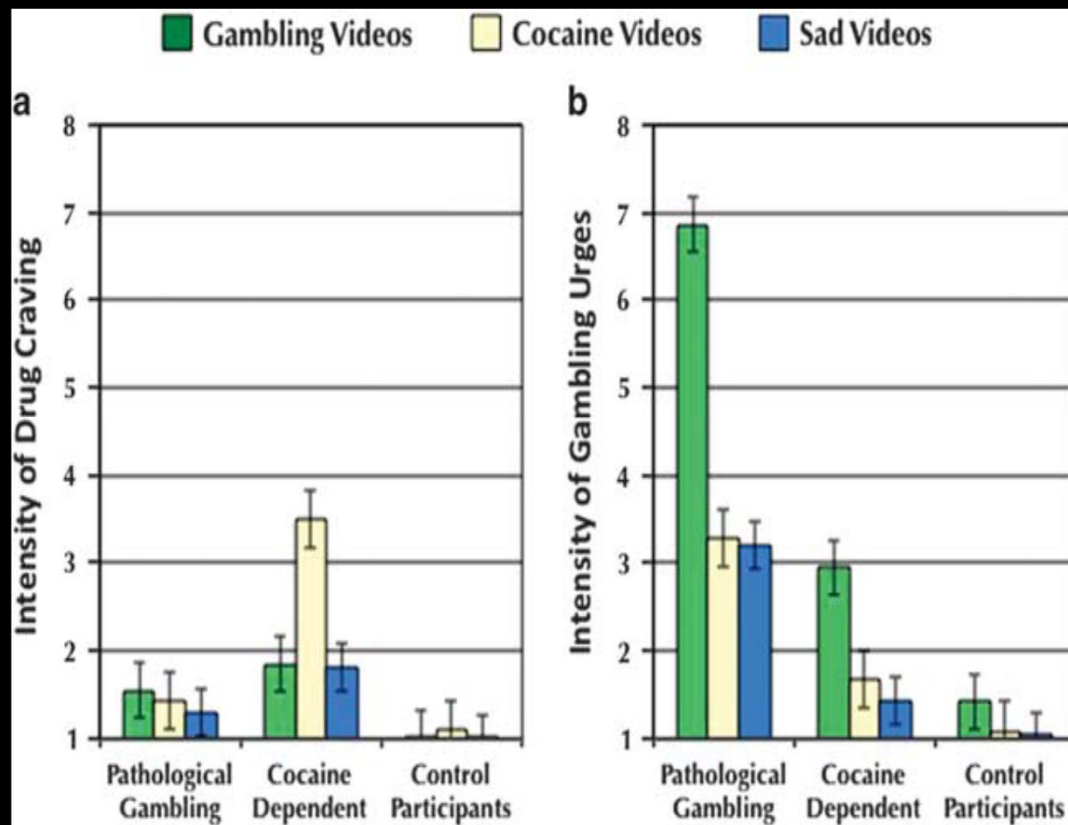
GAMBLING DISORDERS ARE A *BEHAVIORAL ADDICTION*

In DSM-V, gambling disorder joins substance-related addictions in a renamed group called “Addiction and Related Disorders.”

Addiction: a chronic, relapsing brain disease that is characterized by compulsive drug seeking and use, despite harmful consequences.

Gambling: placing something of value at risk in the hopes of gaining something of greater value.

Remembering addiction causes craving



Kober et al., NPP 2016



ELSEVIER

www.elsevier.com/locate/eurneuro



Behavioural addiction—A rising tide?



Samuel R. Chamberlain^{a,b,*}, Christine Lochner^c, Dan J. Stein^d,
Anna E. Goudriaan^e, Ruth Janke van Holst^e, Joseph Zohar^f,
Jon E. Grant^g

3.6. Parkinson's disease and medications: broader implications for neurobiology of behavioural addictions

2014). Various approaches have been used to study the neurobiological underpinnings of impulse control disorders in Parkinson's Disease, including radiotracers, drug manipulations, and neuropsychological tasks (for excellent review see Napier et al., 2015). For example, in a radioligand imaging study in patients



Features of Gambling: Humans versus Rats



money

reward



\$1

\$1000

more likely

less likely

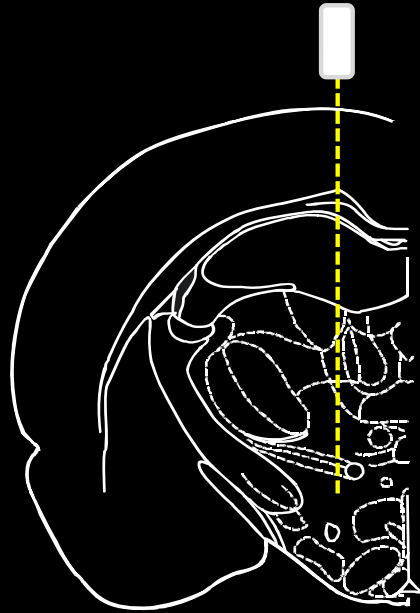
small
reward

LARGE
reward

more likely

less likely

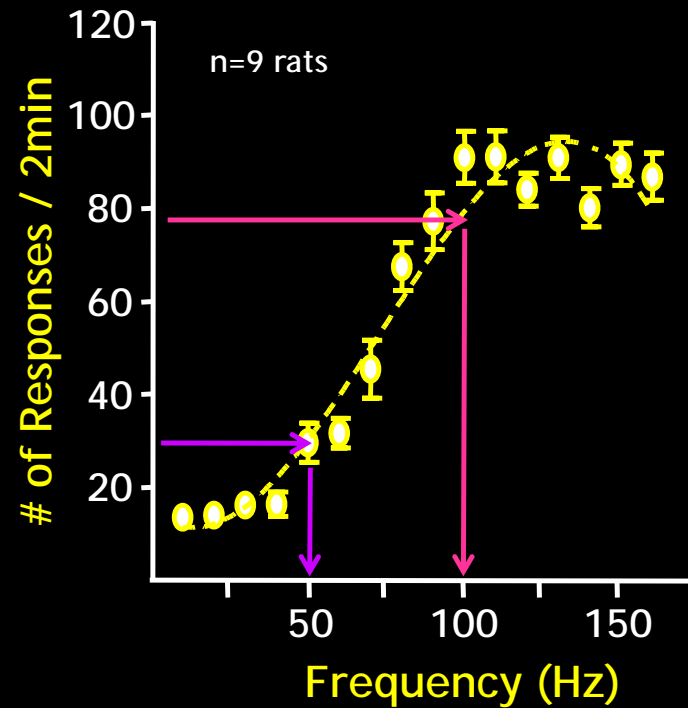
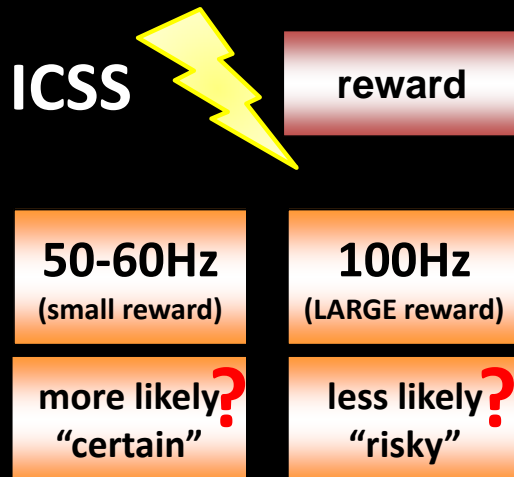
ICSS: Intra-Cranial Self-Stimulation



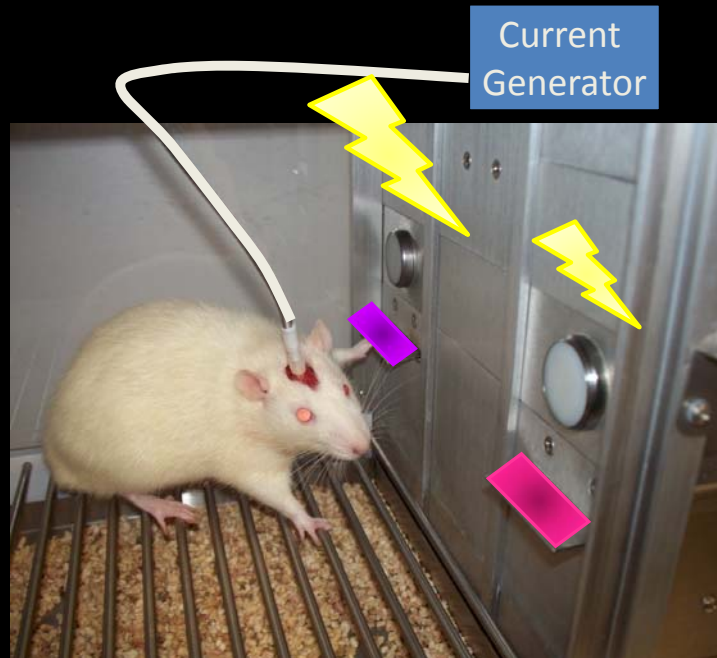
ICSS: Intra-Cranial Self-Stimulation



Determination of Small and Large Rewards Using ICSS



Probability Discounting Task



**"CERTAIN"
LEVER**

small reward
(lower current)
Probability of
reward delivery
is always 100%

**"RISKY"
LEVER**

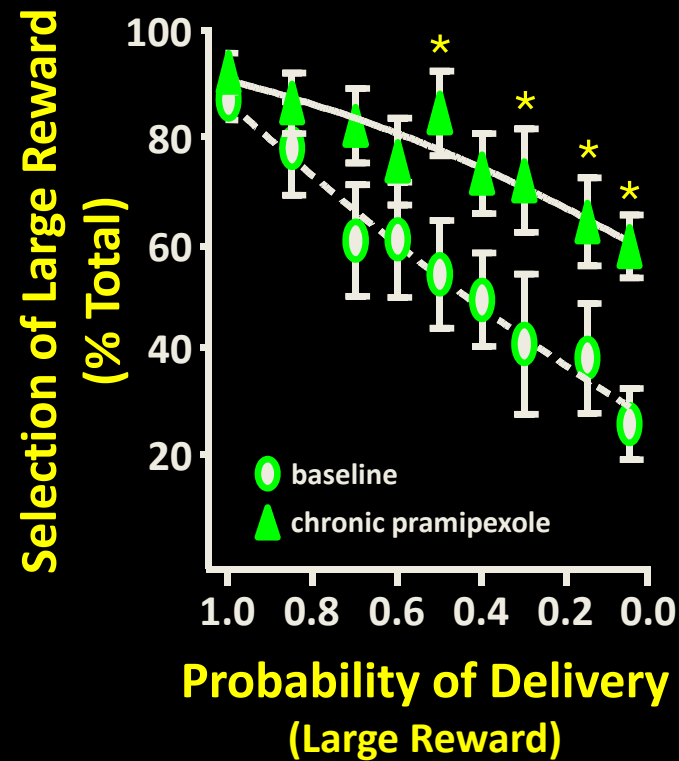
LARGE reward
(higher current)
"risky" lever
Probability of reward
delivery =
100%
80%
70%
60%
50%
40%
30%
15%
5%

Risky Decision-Making

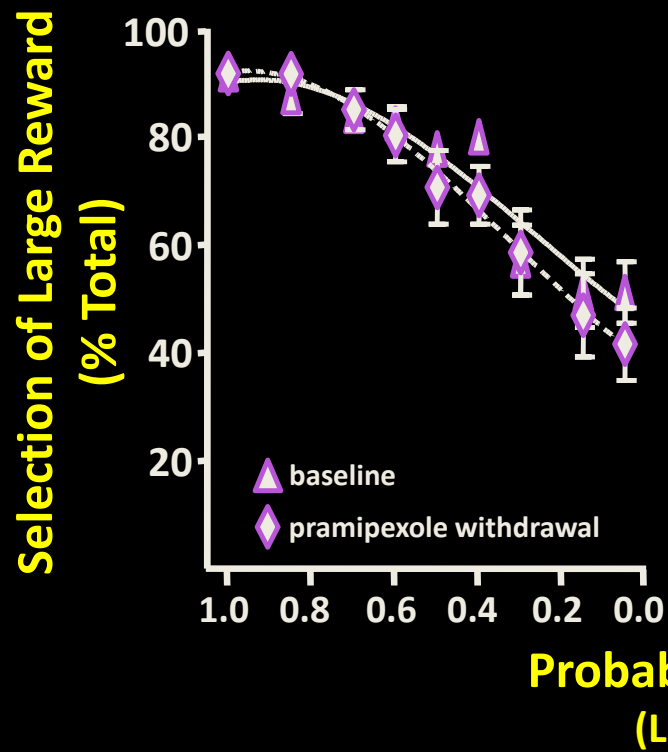


Rokosik and Napier, Journal of Neuroscience Methods, 2011

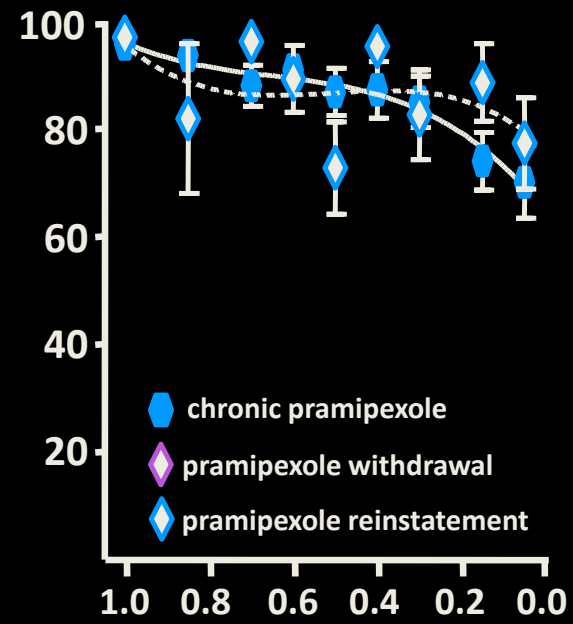
Activating Dopamine Receptors Increases Risk-Taking



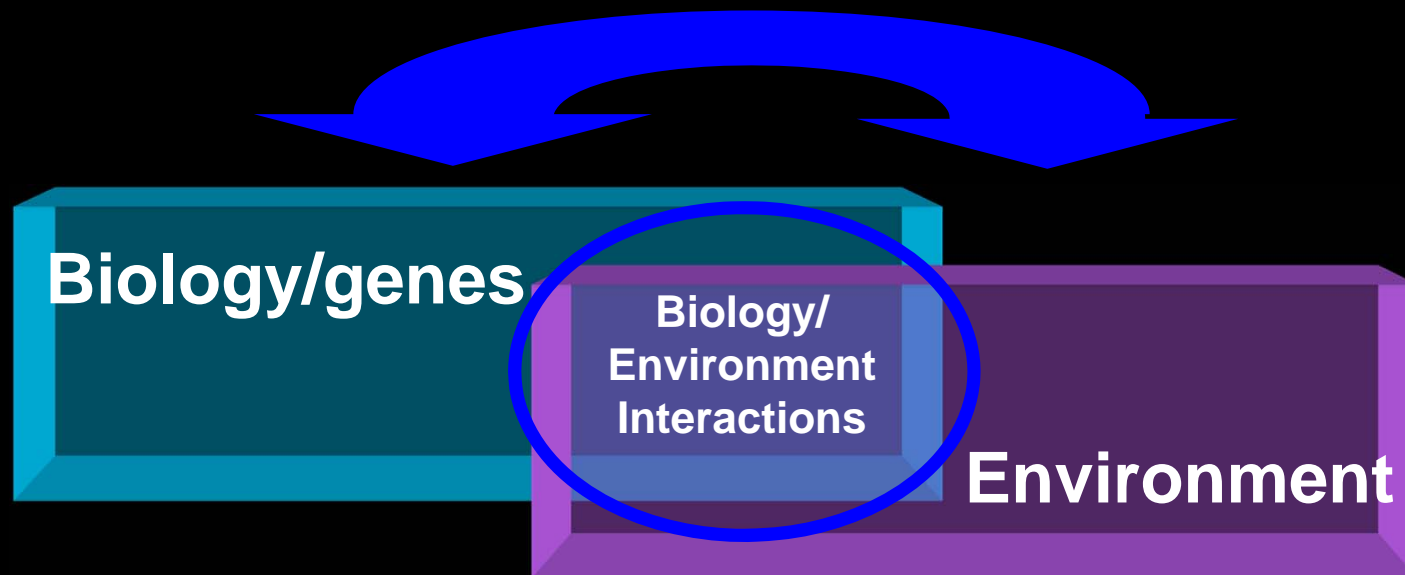
RECOVERY



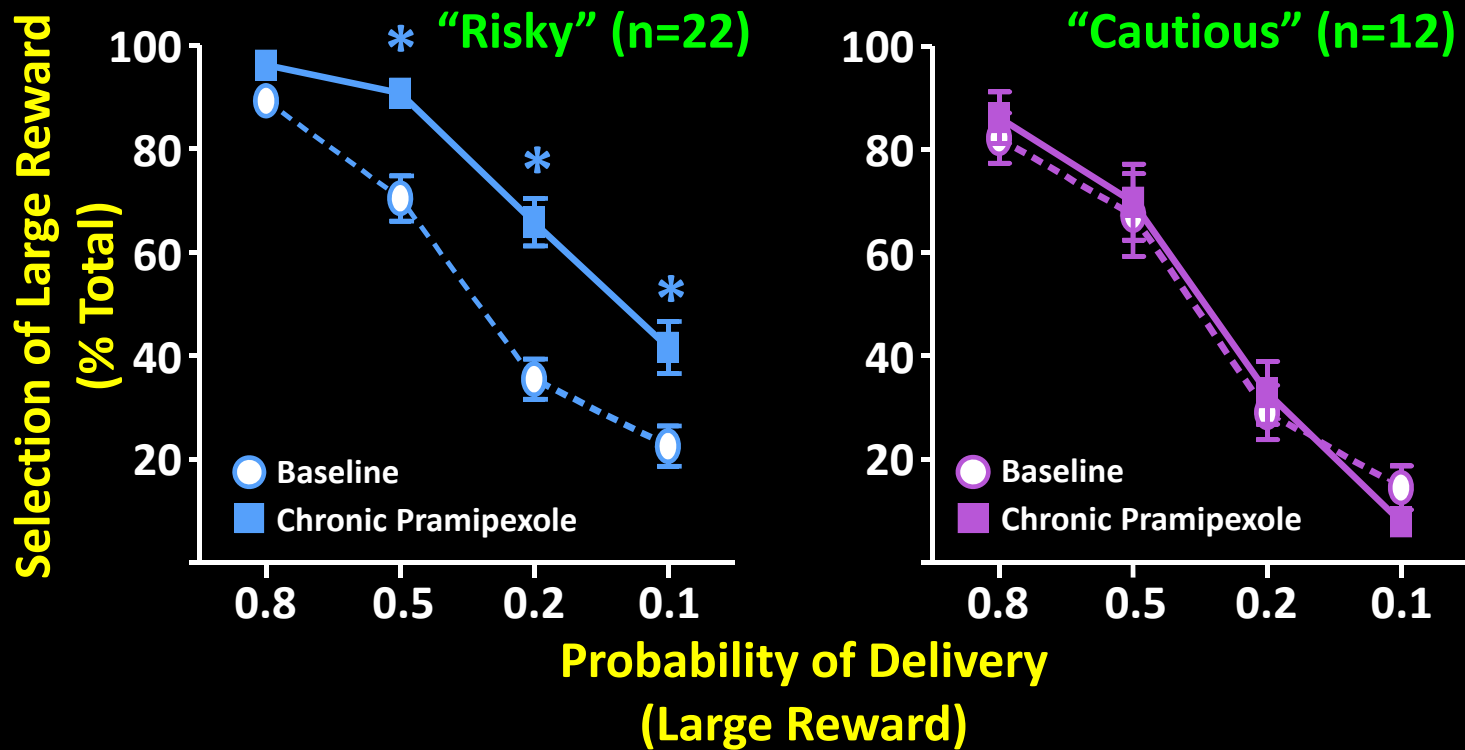
REINSTATEMENT



Addictions are the Quintessential Bio-Behavioral Disorders

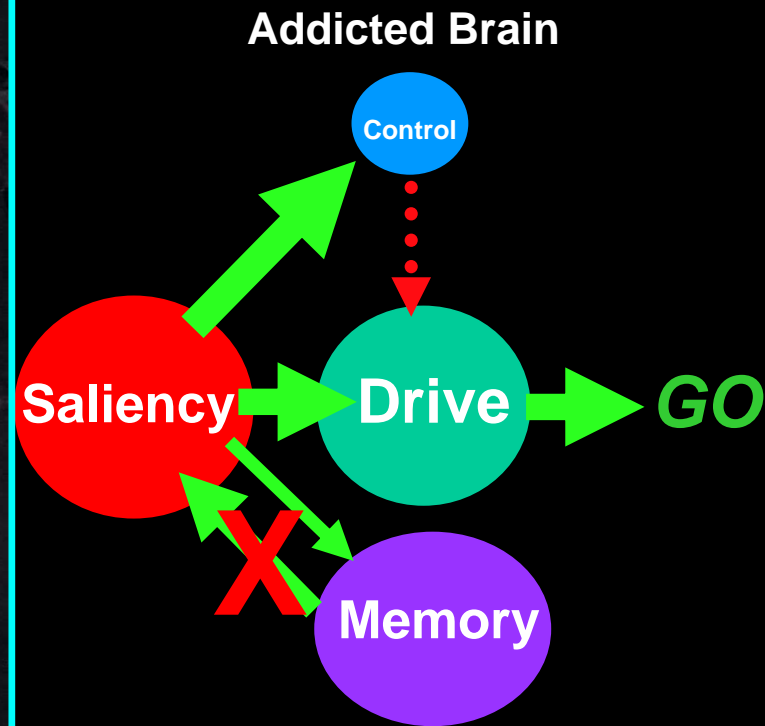
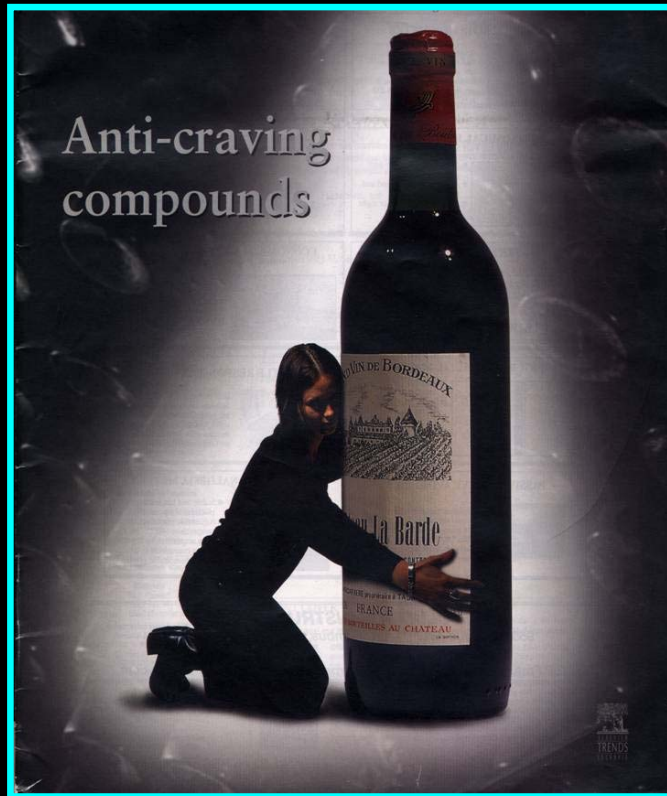


Pramipexole-Induced Risk-Taking: High and Low Responders



Holtz et al. *Prog Neuropsychopharmacology Biol Psychiatry*. 2016.

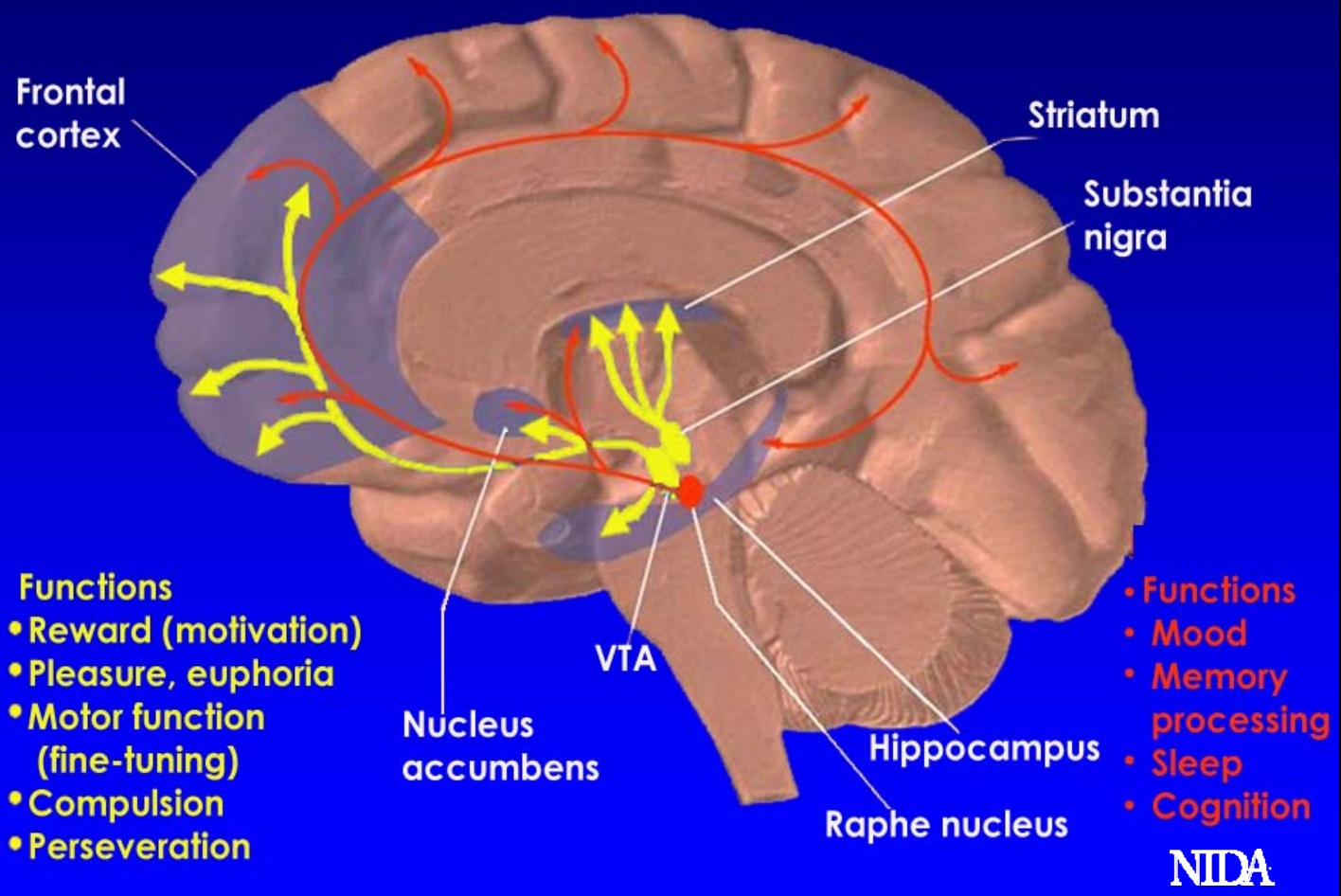
Addiction Changes Brain Circuits that Govern Decisions



Adapted from Volkow et al., Neuropharmacology, 2004

Dopamine Pathways

Serotonin Pathways



MIRTAZAPINE (REMERON®)



Available online at www.sciencedirect.com

ScienceDirect

Drug and Alcohol Dependence 86 (2007) 55–66

**DRUG and
ALCOHOL
DEPENDENCE**

www.elsevier.com/locate/drugalcdep

Nullifying drug-induced sensitization: Behavioral and electrophysiological evaluations of dopaminergic and serotonergic ligands in methamphetamine-sensitized rats

J. McDavid^{a,1}, C.E. Tedford^b, A.R. Mackie^a, J.E. Dallimore^a,
A.L. Mickiewicz^a, F. Shen^{a,c}, J.M. Angle^b, T.C. Napier^{a,c,*}



Available online at www.sciencedirect.com

ScienceDirect

Drug and Alcohol Dependence 99 (2009) 231–239

Mirtazapine treatment after conditioning with methamphetamine alters subsequent expression of place preference

Amy A. Herrold^{a,c,d,*}, Fei Shen^{a,c,d,1}, Martin P. Graham^{c,d}, Laura K. Harper^b,
Sheila E. Specio^{c,d}, Clark E. Tedford^{d,e}, T. Celeste Napier^{c,d}



Available online at www.sciencedirect.com

SciVerse ScienceDirect

www.elsevier.com/locate/brainres



Contents lists available at ScienceDirect

Behavioural Brain Research

journal homepage: www.elsevier.com/locate/bbr

Research report

Repeated mirtazapine nullifies the maintenance of previously established methamphetamine-induced conditioned place preference in rats

Robin M. Voigt^{a,b,*}, Amanda L. Mickiewicz^{a,b,1}, T. Celeste Napier^b

Research Report

The atypical antidepressant mirtazapine attenuates expression of morphine-induced place preference and motor sensitization

Steven M. Graves, Amanda L. Persons¹, Jennifer L. Riddle, T. Celeste Napier^{*}

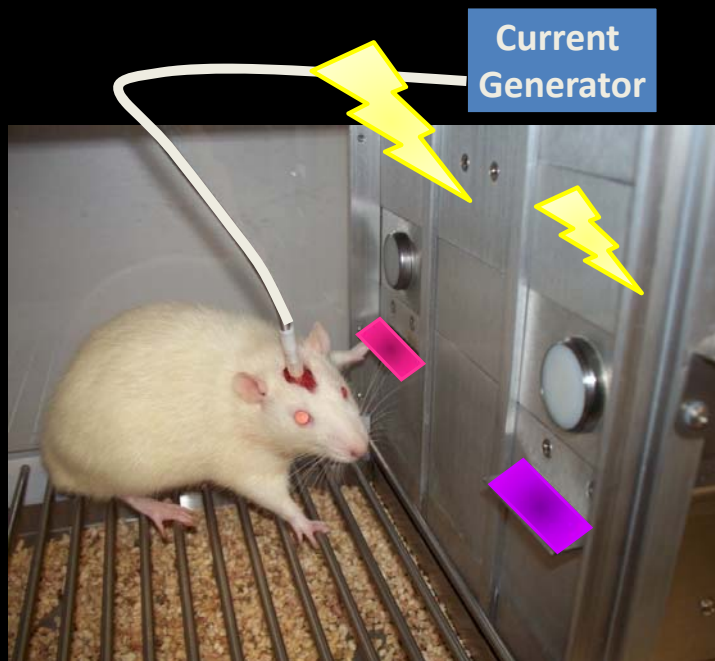
frontiers in
BEHAVIORAL NEUROSCIENCE

ORIGINAL RESEARCH ARTICLE
published: 13 January 2012
doi: 10.3389/fnbeh.2011.00092

Context-dependent effects of a single administration of mirtazapine on the expression of methamphetamine-induced conditioned place preference

Robin M. Voigt^{1,2†} and T. Celeste Napier^{1*}

Cost/Benefit Decision-Making



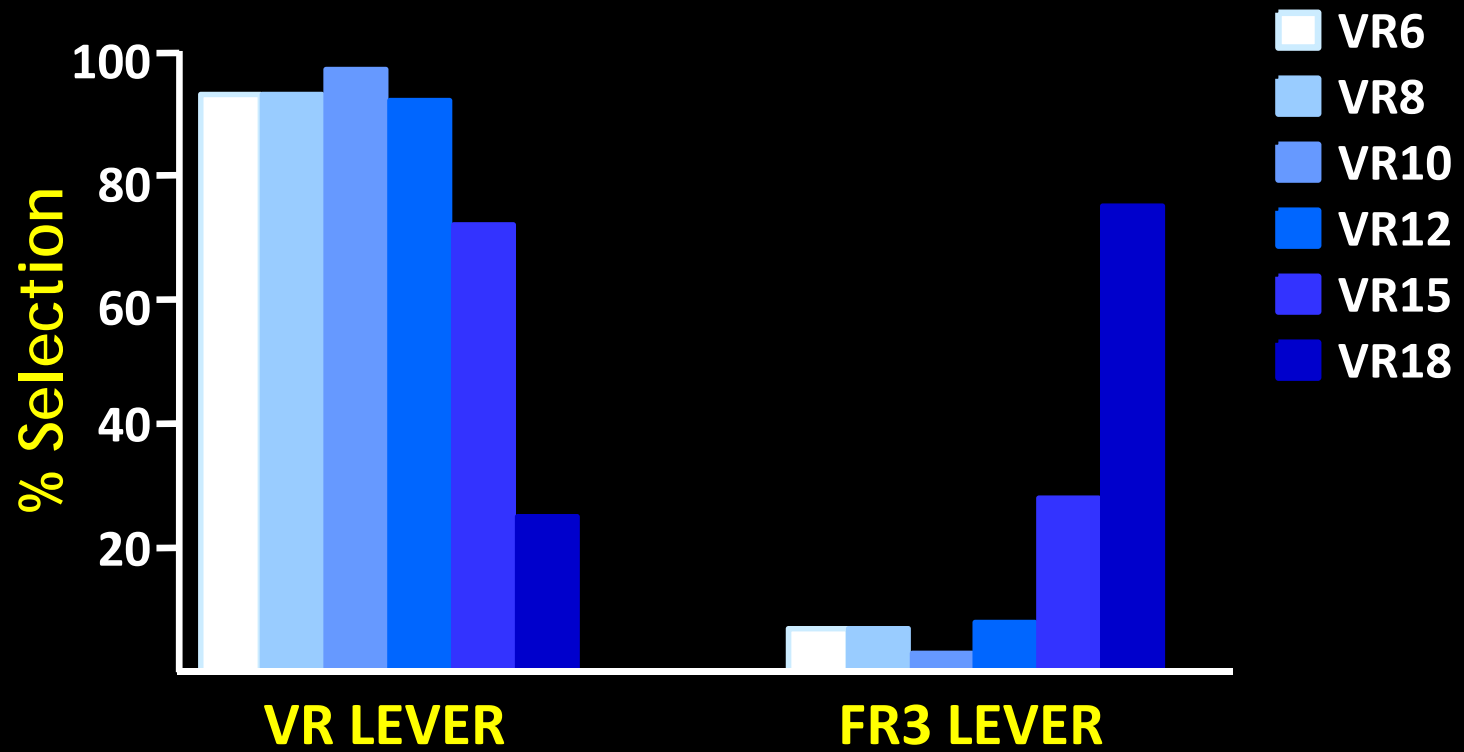
Fixed Ratio

small reward
(50-60Hz)
"low effort"
lever
FR-3

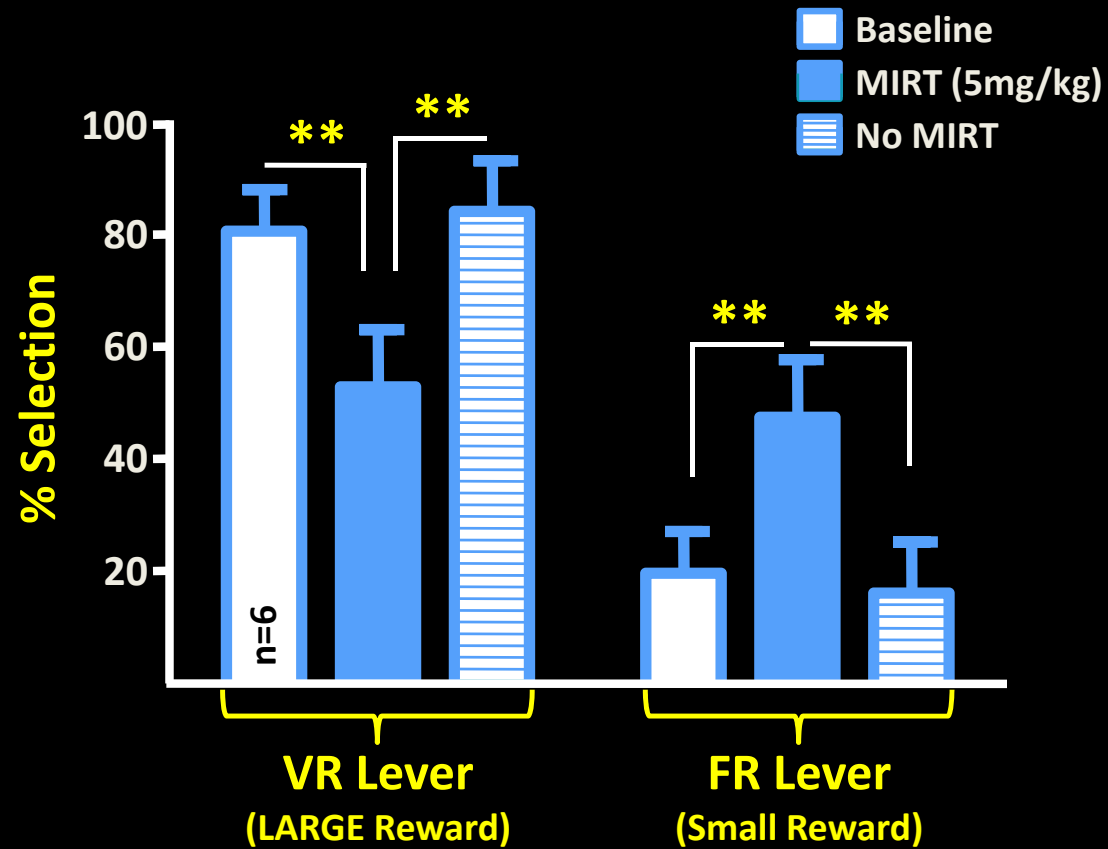
Variable Ratio

LARGE reward
(100Hz)
"high effort" lever
VR-6 = 1, 3, 6, 9, 11
VR-8 = 1, 3, 8, 13, 15
VR-10 = 1, 5, 10, 15, 19
VR-12 = 1, 6, 12, 18, 23
VR-15 = 1, 8, 15, 23, 30

Cost/Benefit Task

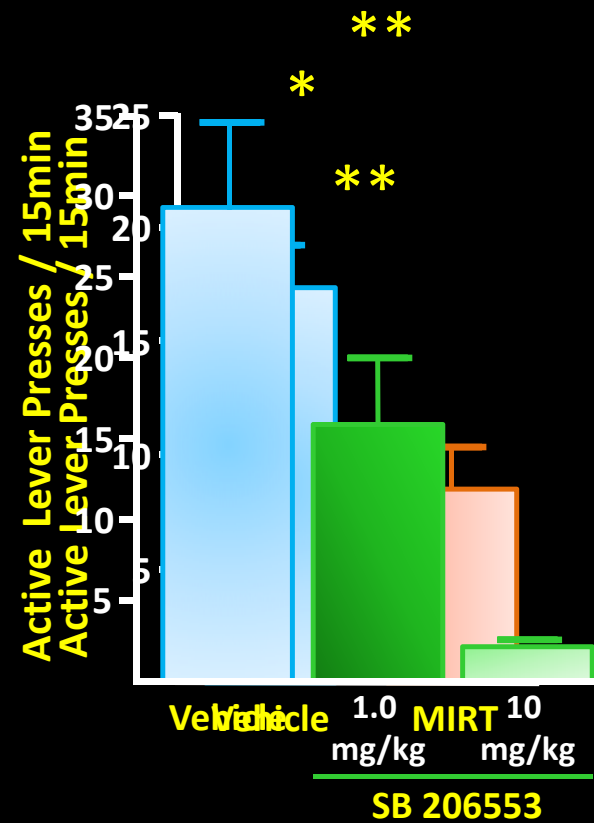


Cost/Benefit Task: *Effects of Mirtazapine*

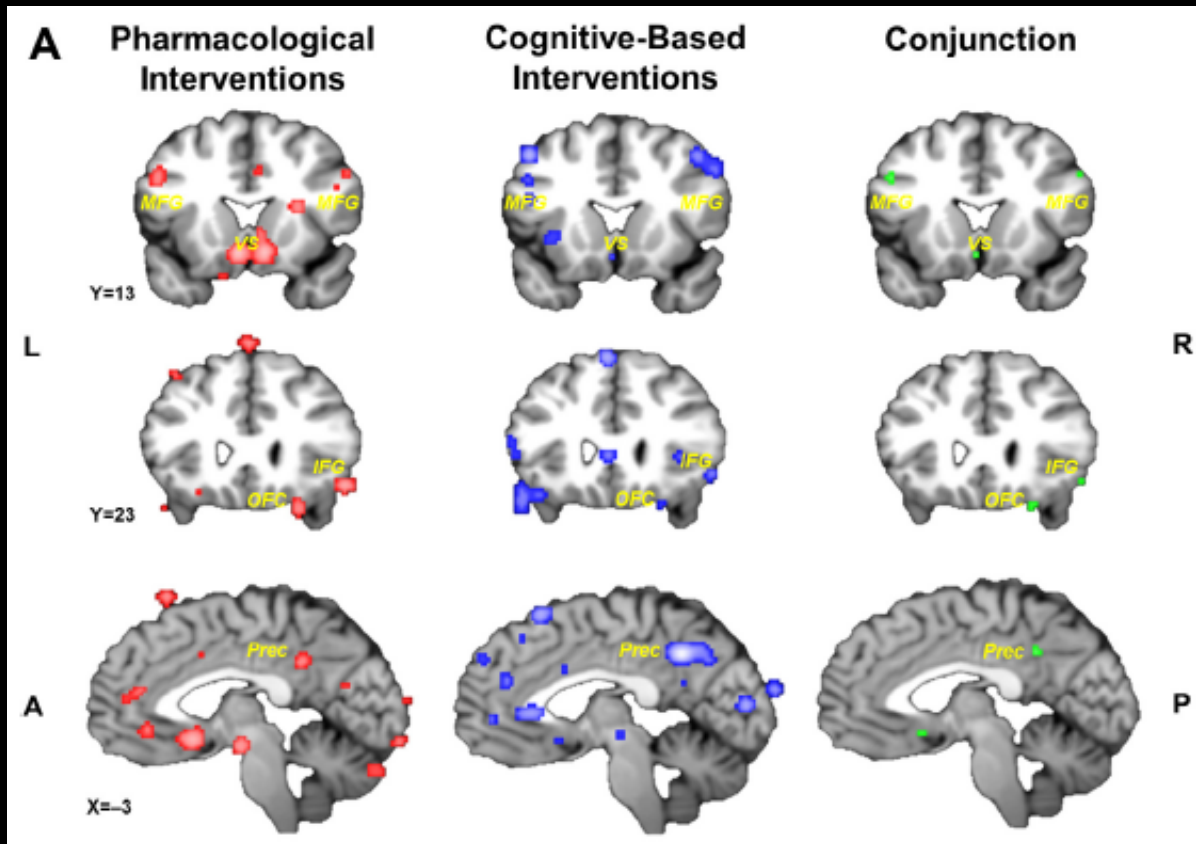


Meth Self-Administration

Drug Seeking

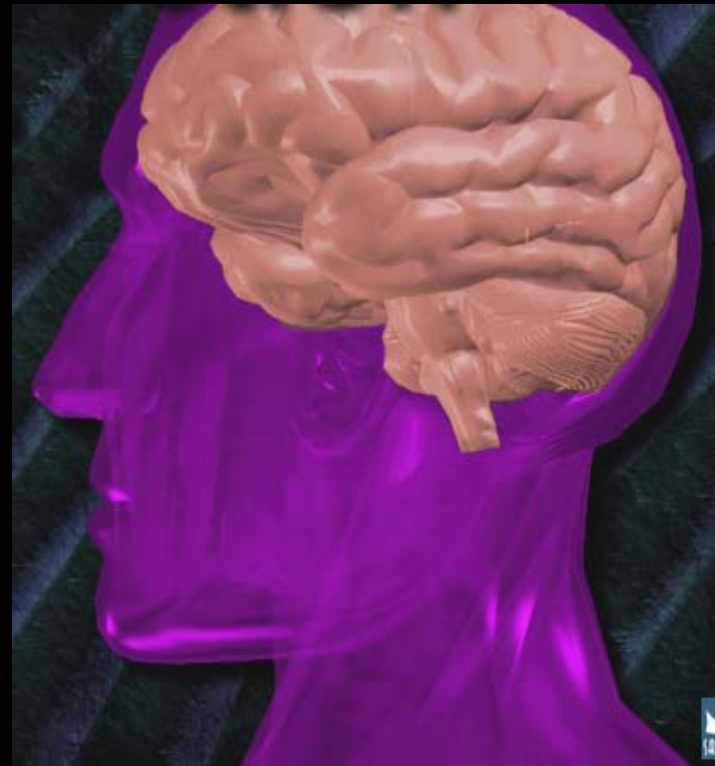


Multi-faceted Treatment



Konova et al.,
Neurosci &
Biobeh Rev
37:2806,
2013.

Questions and Discussion



Novel Strategies (Monotherapy and Adjunct) Beyond Pharmacologics

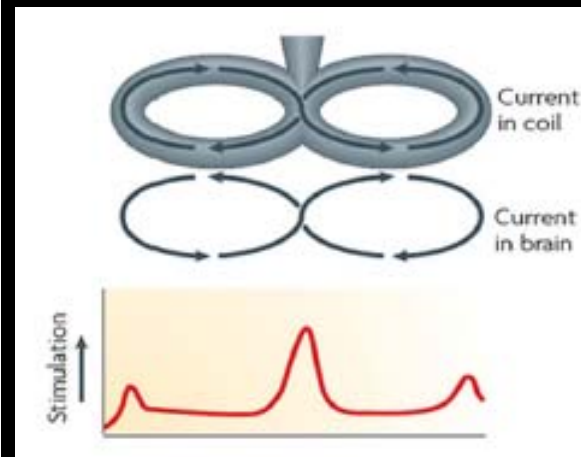
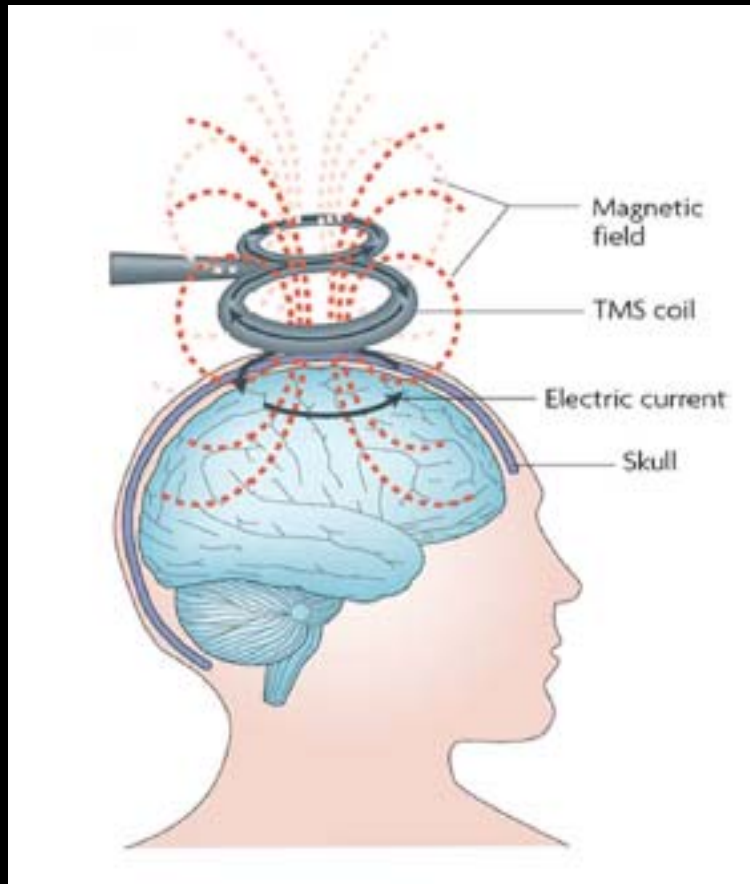
ANNALS OF THE NEW YORK ACADEMY OF SCIENCES In press, 2014

Issue: *Addiction Reviews*

**Transcranial magnetic stimulation in the treatment of
substance addiction**

David A. Gorelick,^{1,2} Abraham Zangen,³ and Mark S. George^{4,5}

Transcranial Magnetic Stimulation



Gorelick et al.,
Ann NY Acad Sci,
in press, 2014.



Contents lists available at SciVerse ScienceDirect

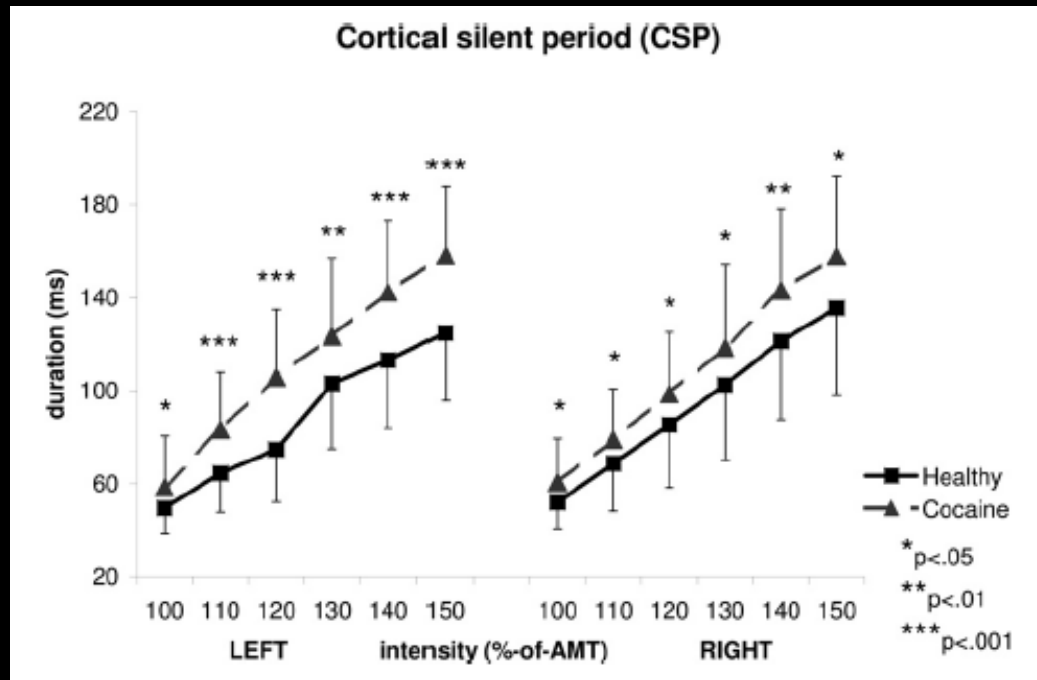
Journal of Psychiatric Research

journal homepage: www.elsevier.com/locate/psychires



Dysbalance of cortical inhibition and excitation in abstinent cocaine-dependent patients[☆]

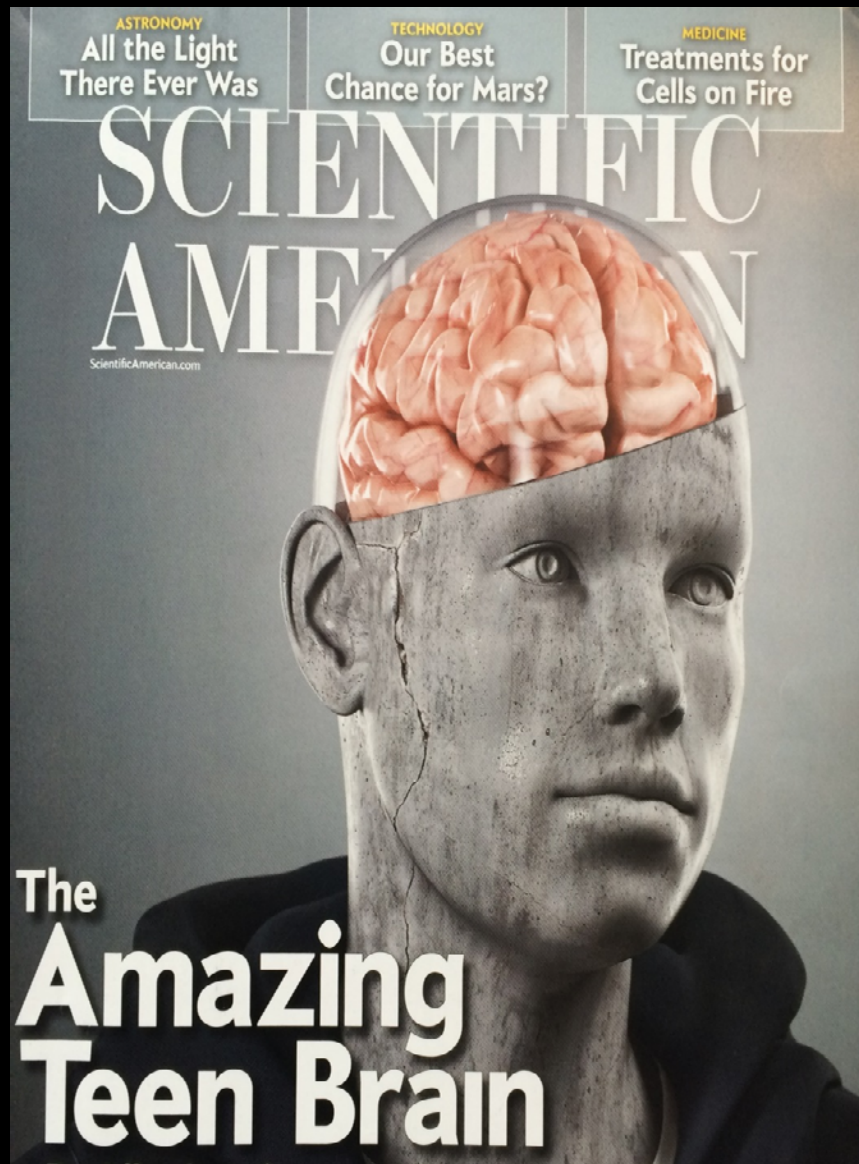
Klevest Gjini^{a,*}, Ulf Ziemann^b, T. Celeste Napier^c, Nash Boutros^a



Published studies on drug craving and DLPFC rTMS

- Nicotine (6/7 decreased)
- Cocaine/meth (2/3 decreased)
- Alcohol (3/3 decreased)

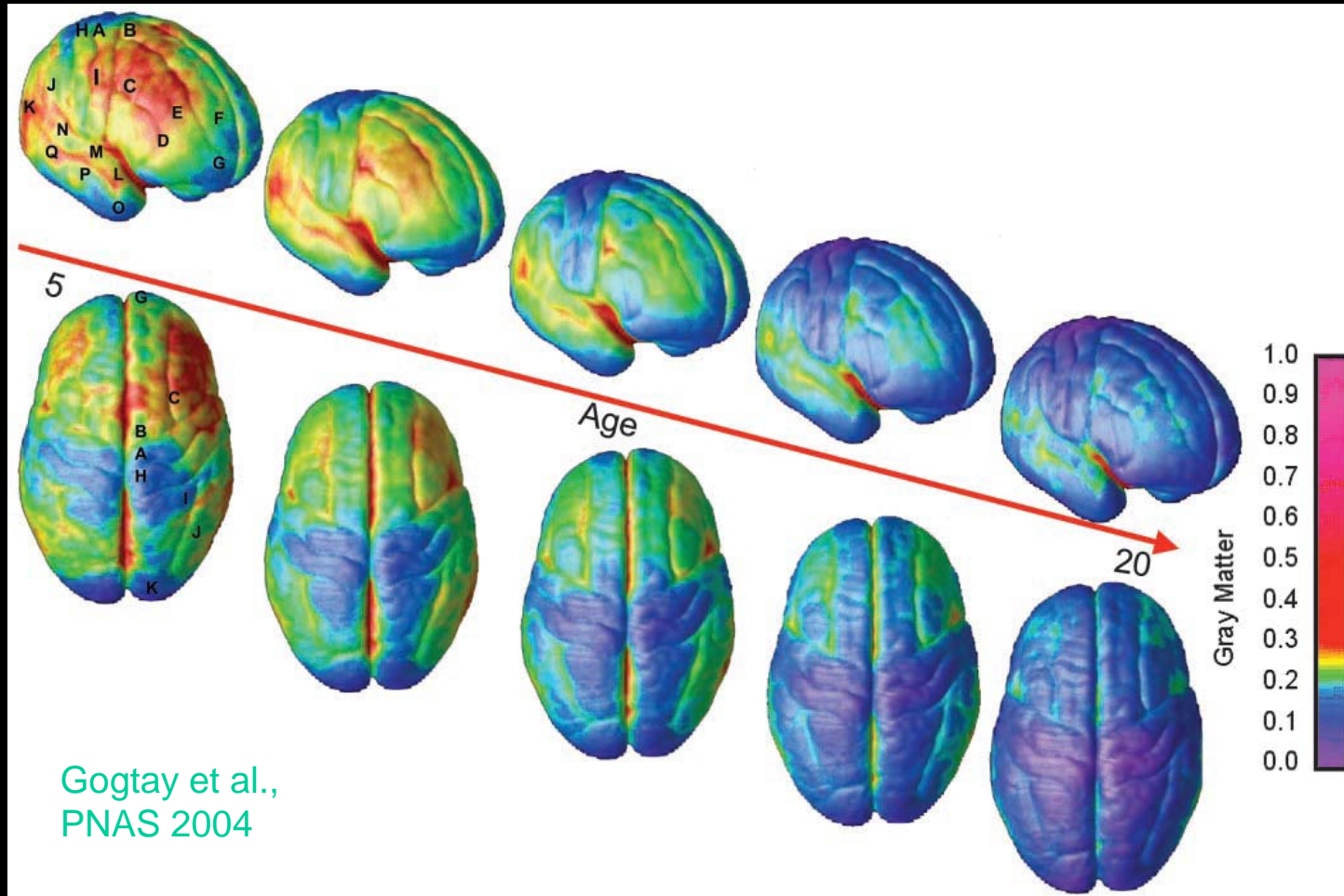
Gorelick et al.,
Ann NY Acad Sci,
2014



“Rapidly changing wiring leads to mental agility – and risky behavior”

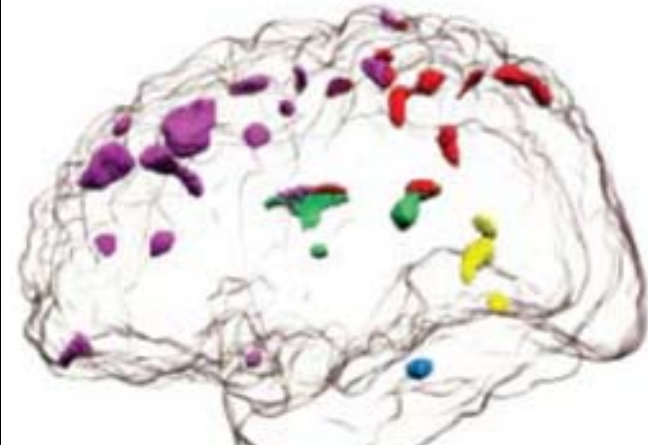
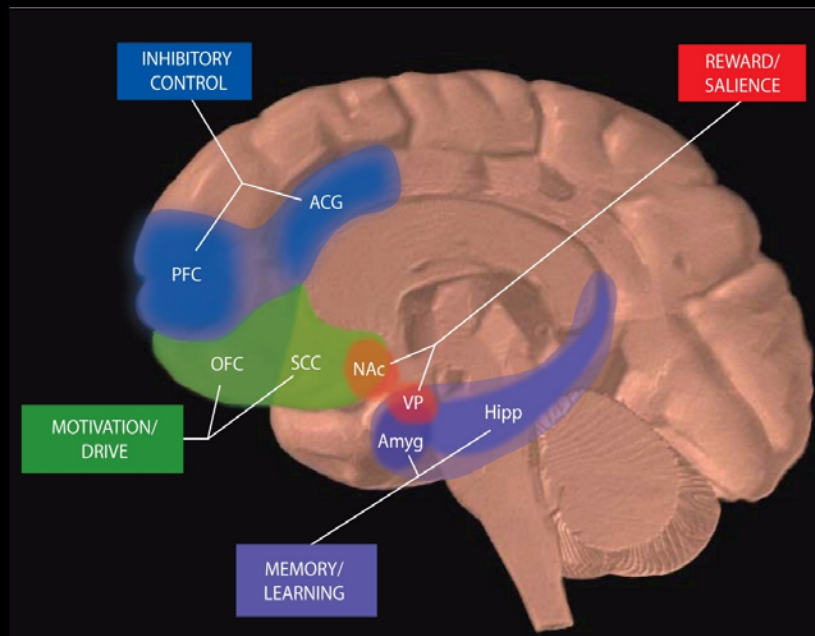
By Jay N. Giedd

Healthy brain development

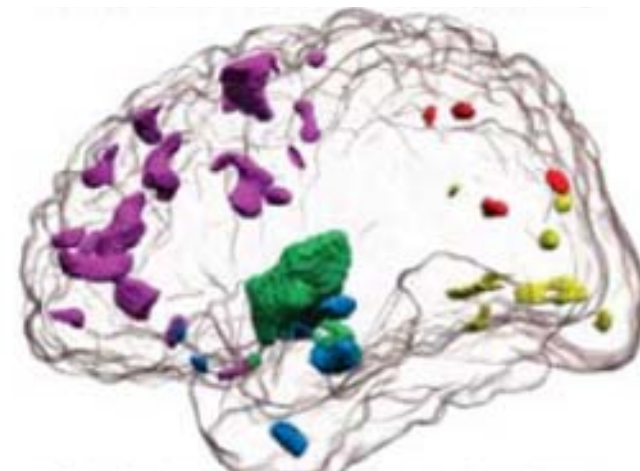


Patterns of cortical maturation during development

Sowell et al. The Neuroscientist, 2004.



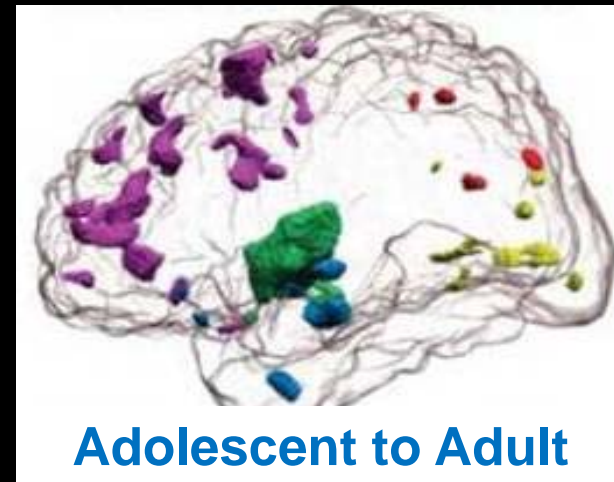
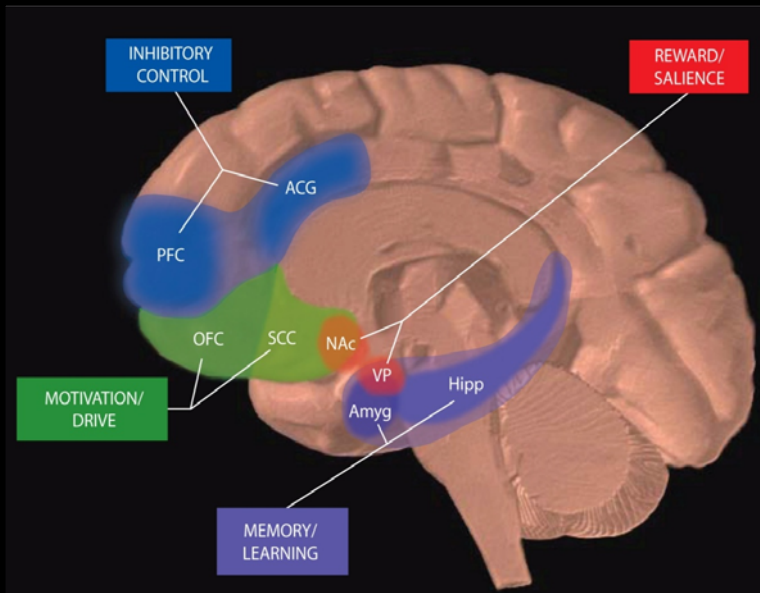
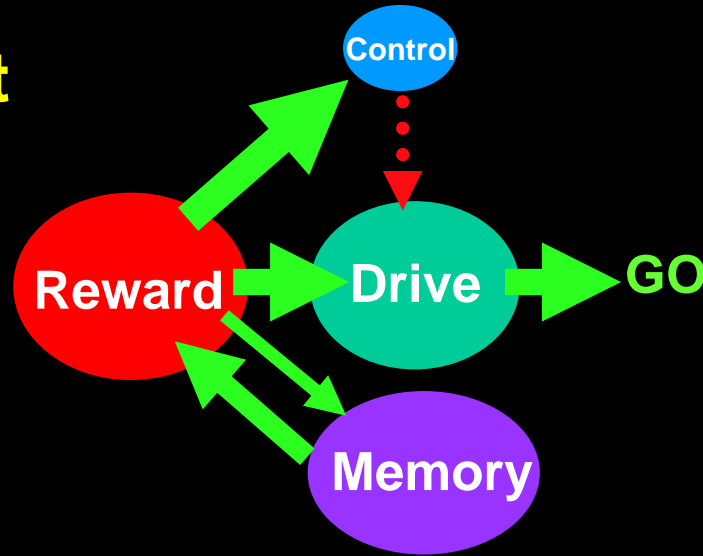
Child to Adolescent

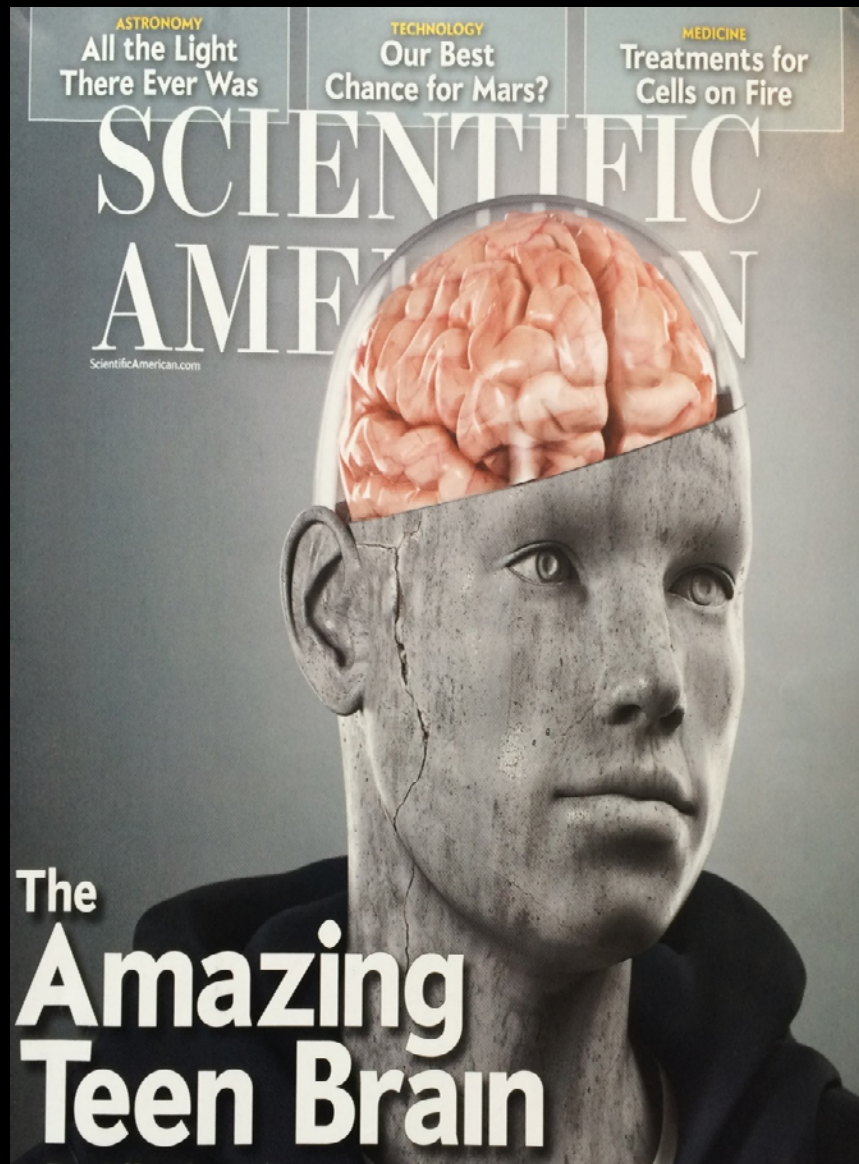


Adolescent to Adult

Cortical development and decision making

Sowell et al. The Neuroscientist, 2004.





“Rapidly changing wiring leads to mental agility – and risky behavior”

By Jay N. Giedd

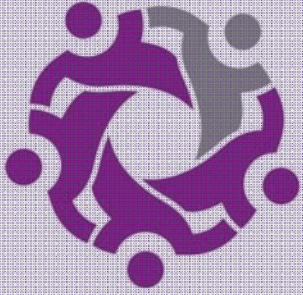
Time of increased vulnerability to developing substance use disorders. With potential for long-term consequences.



Creating and Presenting Case-Based Educational Materials: Interprofessional Team Approach to Teaching Management of a Complex Patient

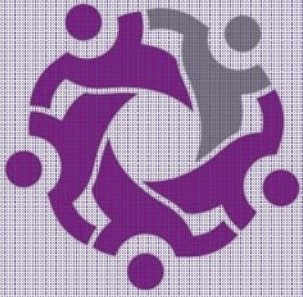
Magdalena Bednarczyk, MD

Erin E. Emery-Tiburcio, PhD, ABPP



Geriatrics Workforce Enhancement Program

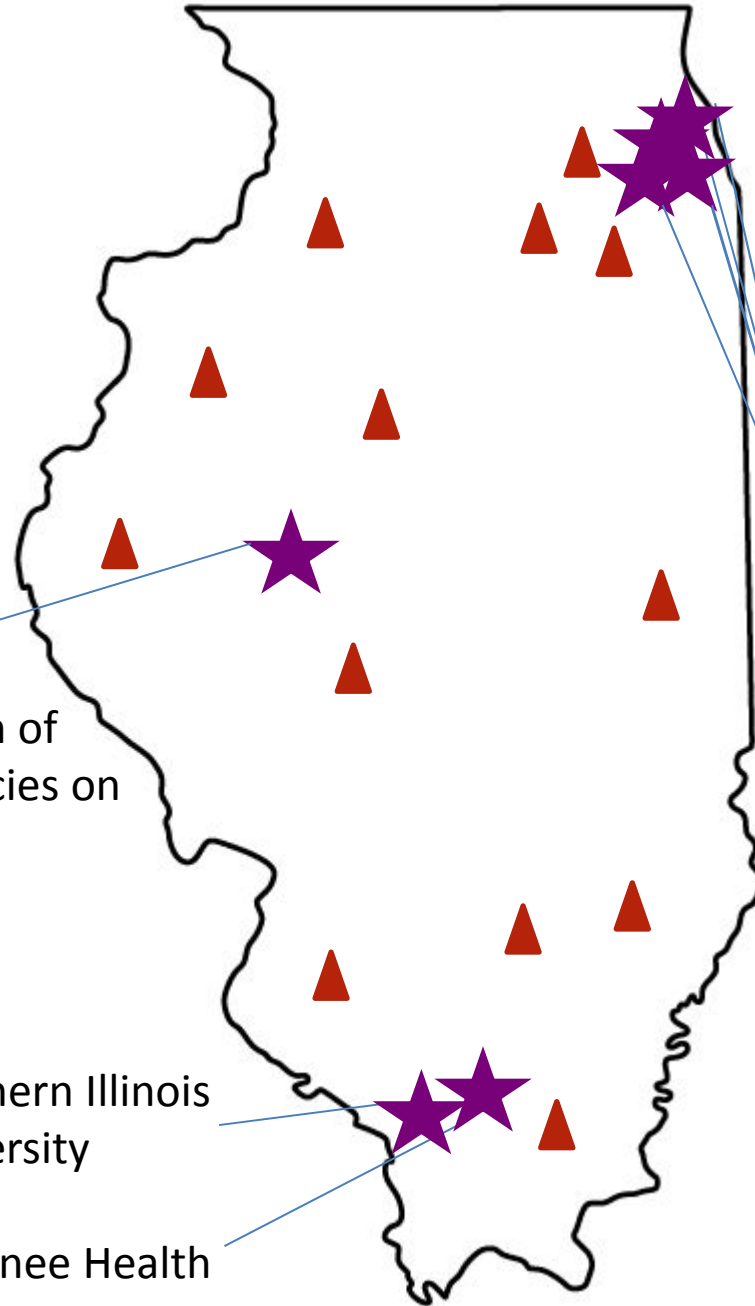
- HRSA funding: \$35.7 million awarded in total
- 44 GWEPs in 29 states
- CATCH-ON (Collaborative Action Team training for Community Health – Older adult Network)



CATCH-ON Partners

Illinois
Association of
Area Agencies on
Aging

- Southern Illinois University
- Shawnee Health Service



Chicago partners:

- Rush University Medical Center
- Lawndale Christian Health Center
- Howard Brown Health
- Cook County Health and Hospitals System
- CJE SeniorLife
- Health and Medicine Policy Research Group
- Continuing Education Institute of Illinois
- Coalition for Limited English Speaking Elderly
- Illinois Cognitive Resources Network

▲ Area Agency on Aging



CATCH-ON Elements

Education

- Interactive Online Training
- Faculty Development & Course Material
- Learning Communities
- HEALE – Health Education About LGBT Elders
- Health Ambassadors
- Ongoing Evidence-Based Programs

Geriatric Primary Care Transformation: CATCH-ON Community Health

- Readiness assessment
- Tailored program development – evidence-based programs
- Training and support for clinics
- Outcome assessment



Online Modules

Basics:

- Normal Aging
- Managing Multiple Chronic Conditions (MCC)
- Evaluating Memory Concerns
- Interprofessional Teams and Older Adults
- Caregiver Skill Building Intervention (CSBI)

Dementia:

- Unique needs of people with dementia during hospitalization
- Understanding and managing behavioral symptoms of dementia



Online Modules – *Coming Soon*

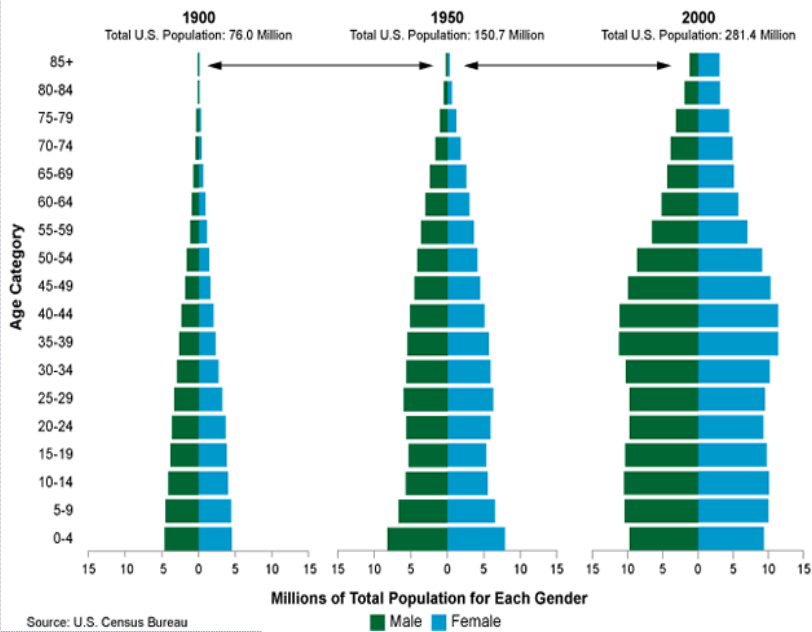
- **Communication:**
 - Communicating effectively with older adults and families
 - Communicating effectively in the complexity of Multiple Chronic Conditions
 - Communicating effectively in Interprofessional Teams



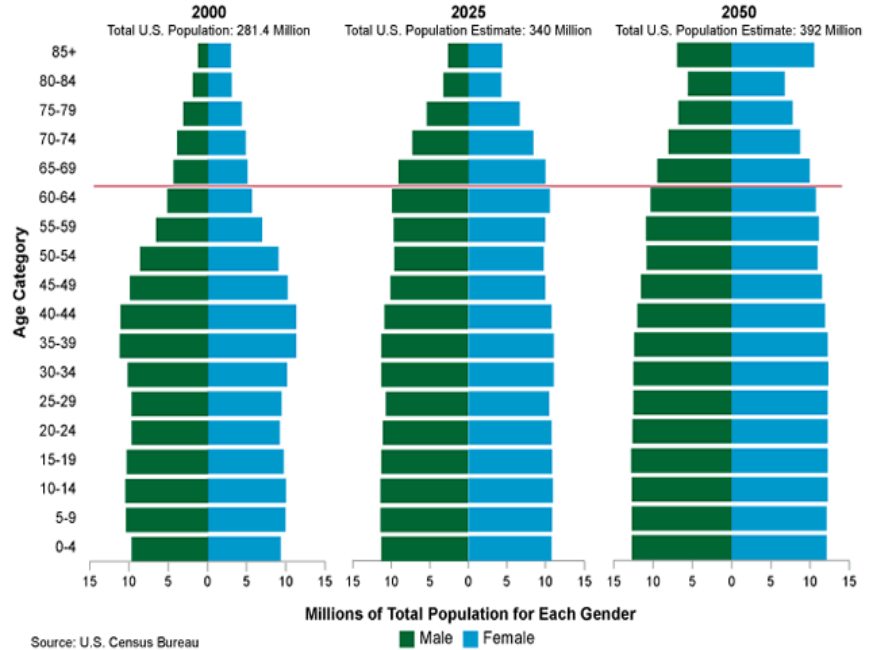
The Geriatric Assessment:
Improving Care of Older Adults
Through Interventions to Decrease
Functional Decline



Until 2000, the 85+ Age Category Was a Tiny Minority of the Total Population
 U.S. Population by Age Category and Gender: 1900, 1950 and 2000



By 2050, People Age 65 and Older Will Equal 20% of the Population
 U.S. Population (and Forecast) by Age Category and Gender: 2000, 2025 and 2050





GERIATRICS

Age >65

Chronic disease

Interdisciplinary approach

Functional status



Geriatric Assessment

- Includes non medical domains such as:
 - Functional capacity
 - Quality of life
 - Incorporates a multidisciplinary team including a physician, nutritionist, social worker, and physical and occupational therapists
- Often yields a more complete and relevant list of medical problems, functional problems, and psychosocial issues



Healthy Aging

- Abroad concept including **physical as well as mental health and social well-being** and is most likely to be achieved when physical environments and communities are safe, and support the adoption and maintenance by individuals of attitudes and behaviors known **to promote health and well-being;** and by the effective use of health services and community programs to **prevent or minimize the impact of acute and chronic disease on function**



Chronologic vs. Functional Age



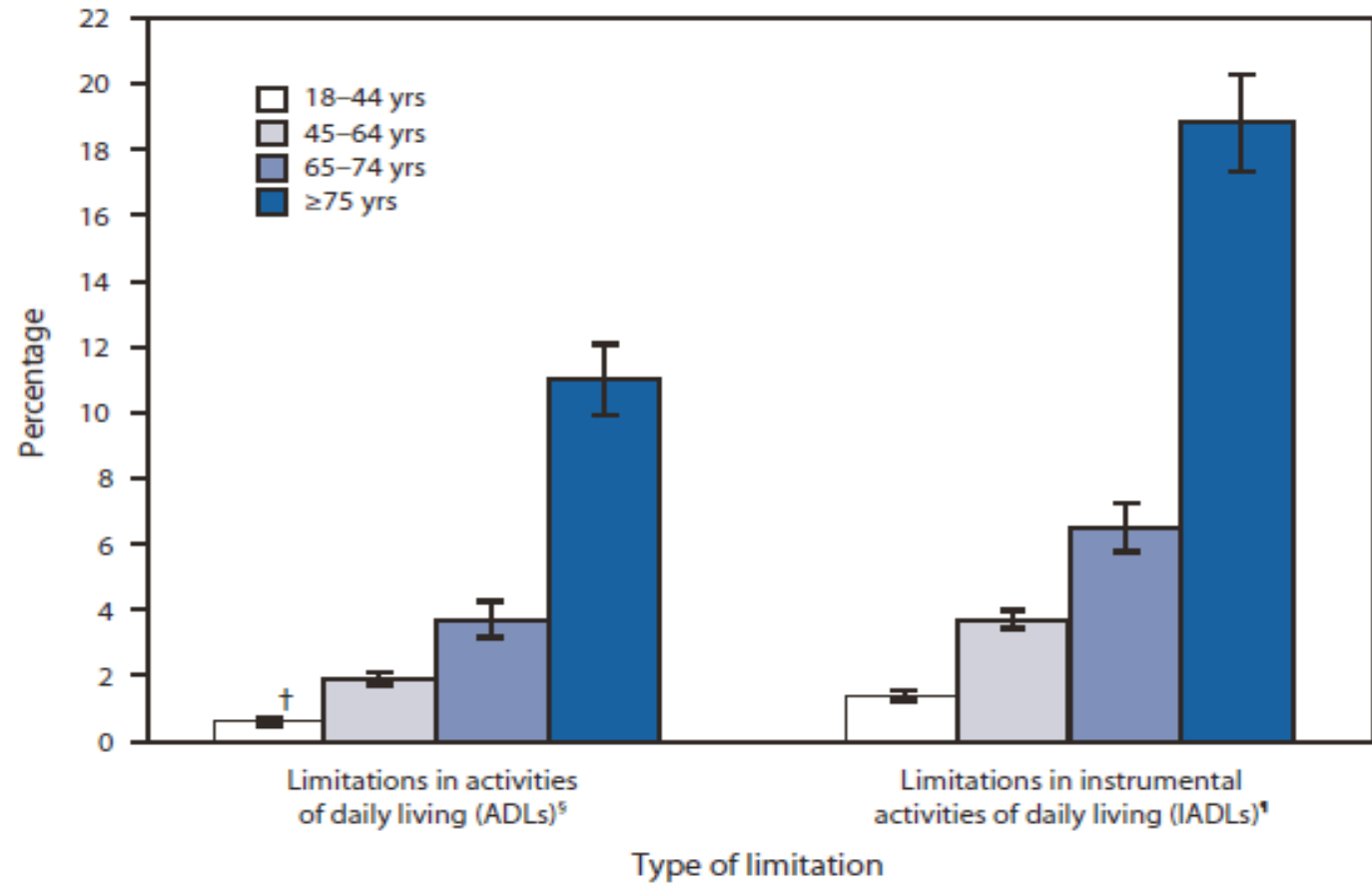


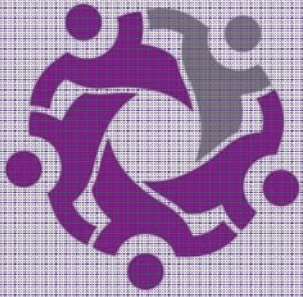
Activities of Daily Living

- **Activities of Daily Living (ADLs)**
 - Bathing
 - Dressing
 - Toileting
 - Transfers
 - Grooming
 - Feeding
- **Instrumental Activities of Daily Living (IADLs)**
 - Grocery shopping
 - Meal preparation
 - Using the telephone
 - Driving and transportation
 - Handling own finances
 - Laundry
 - Housekeeping

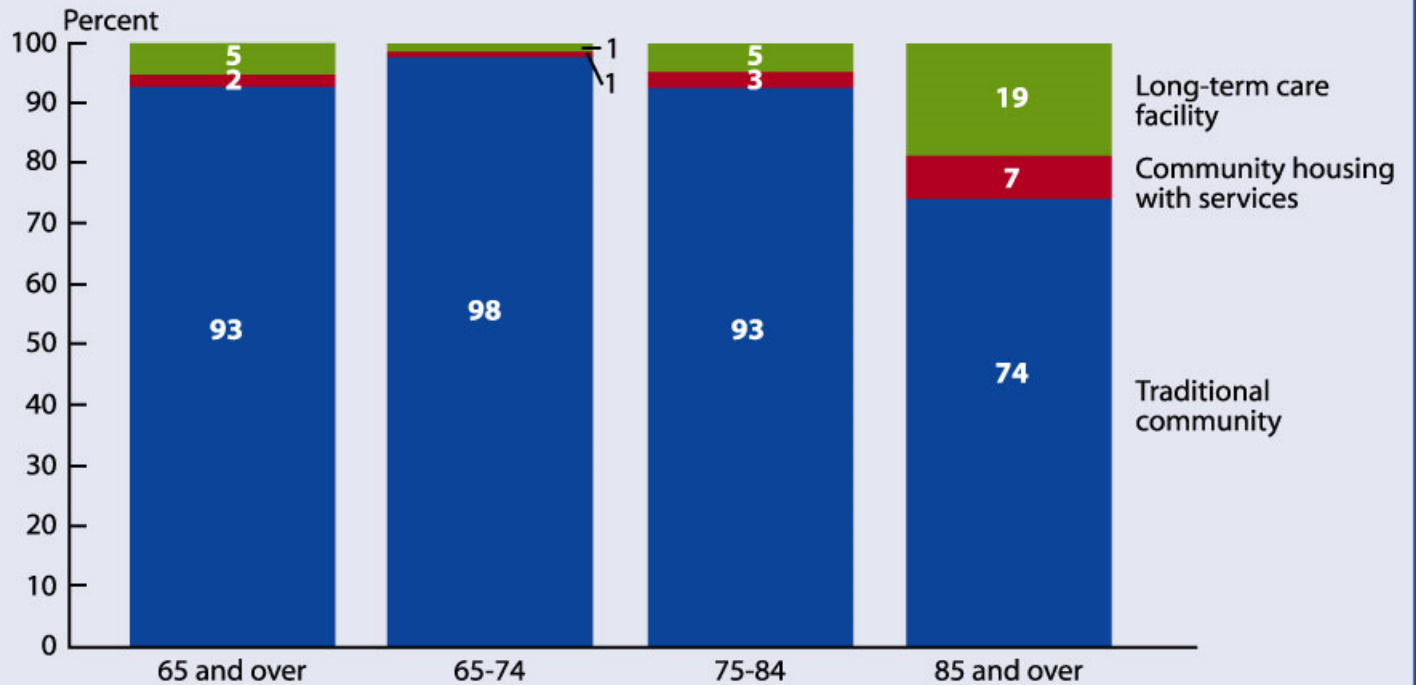


Percentage of Adults with Activity Limitations, by Age Group and Type of Limitation — National Health Interview Survey, United States, 2010





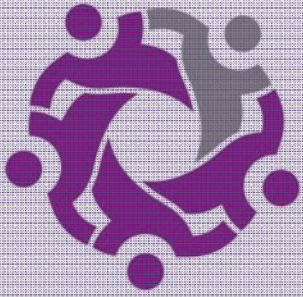
Percentage of Medicare enrollees age 65 and over residing in selected residential settings, by age group, 2002



Note: Community housing with services applies to respondents who reported they lived in retirement communities or apartments, senior citizen housing, continuing care retirement facilities, assisted living facilities, staged living communities, board and care facilities/homes, and other similar situations, AND who reported they had access to one or more of the following services through their place of residence: meal preparation, cleaning or housekeeping services, laundry services, help with medications. Respondents were asked about access to these services but not whether they actually used the services. A residence is considered a long-term care facility if it is certified by Medicare or Medicaid; or has 3 or more beds and is licensed as a nursing home or other long-term care facility and provides at least one personal care service; or provides 24-hour, 7-day-a-week supervision by a caregiver.

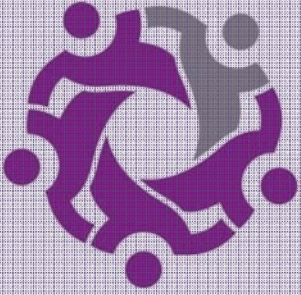
Reference population: These data refer to Medicare enrollees.

Source: Centers for Medicare & Medicaid Services, Medicare Current Beneficiary Survey.



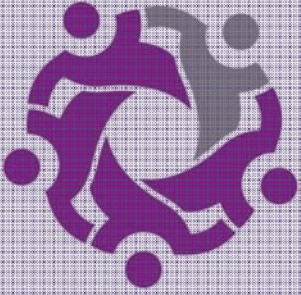
The Impact of Functional Status on Life Expectancy in Older Adults

| Age | Initial Function | Independent Years | ADL Disabled Years | Total Years |
|-----|------------------|-------------------|--------------------|-------------|
| 70 | Independent | 10.0 | 2.7 | 16.7 |
| | ADL disabled | 3.0 | 5.6 | 11.5 |
| 75 | Independent | 7.0 | 2.6 | 13.2 |
| | ADL disabled | 1.1 | 5.3 | 8.2 |
| 80 | Independent | 4.7 | 2.4 | 10.3 |
| | ADL disabled | 0.4 | 4.7 | 6.0 |
| 85 | Independent | 3.3 | 1.8 | 8.0 |
| | ADL disabled | 0.1 | 4.0 | 4.6 |



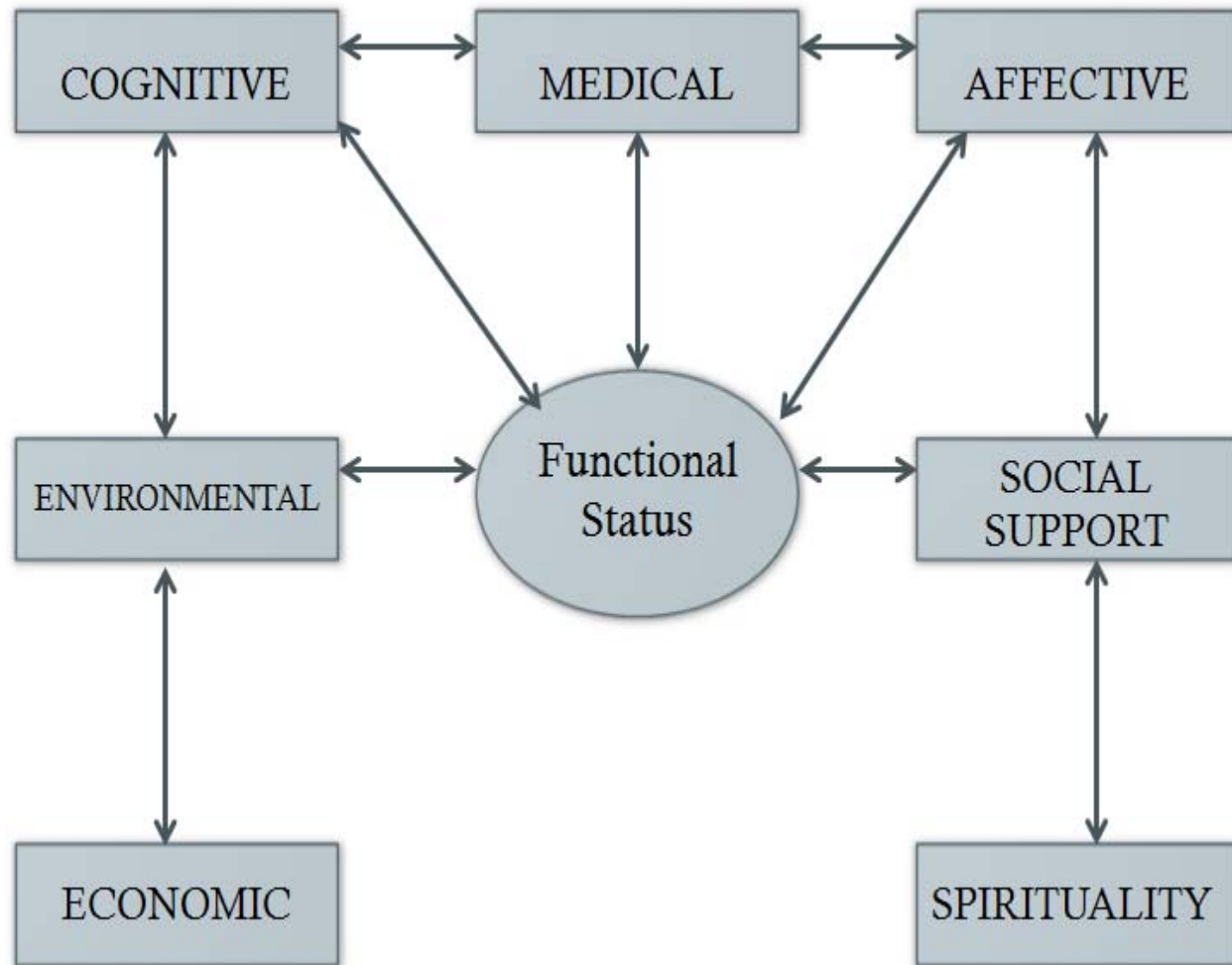
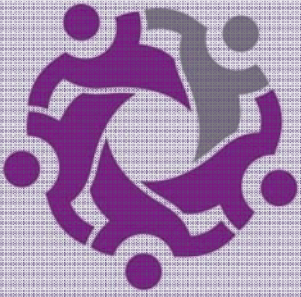
LIFE EXPECTANCY IN LATER YEARS, US 2009

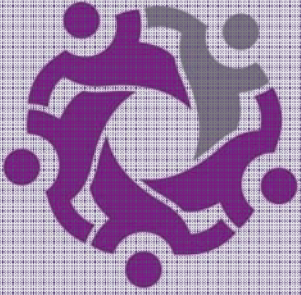
| Age | YEARS FEMALES | YEARS MALES |
|-----|------------------|----------------|
| 65 | 20.3 | 17.6 |
| 75 | 12.9 | 11.0 |
| 85 | 7.0 | 5.9 |
| 95 | 3.4 | 2.9 |



Geriatric Assessment

- Alcohol and medication abuse
- Balance, gait, and falls
- Chronic pain
- Cognition
- Elder abuse
- Hearing
- Nutrition
- Polypharmacy
- Urinary incontinence
- Vision
- Wounds and Wound Care





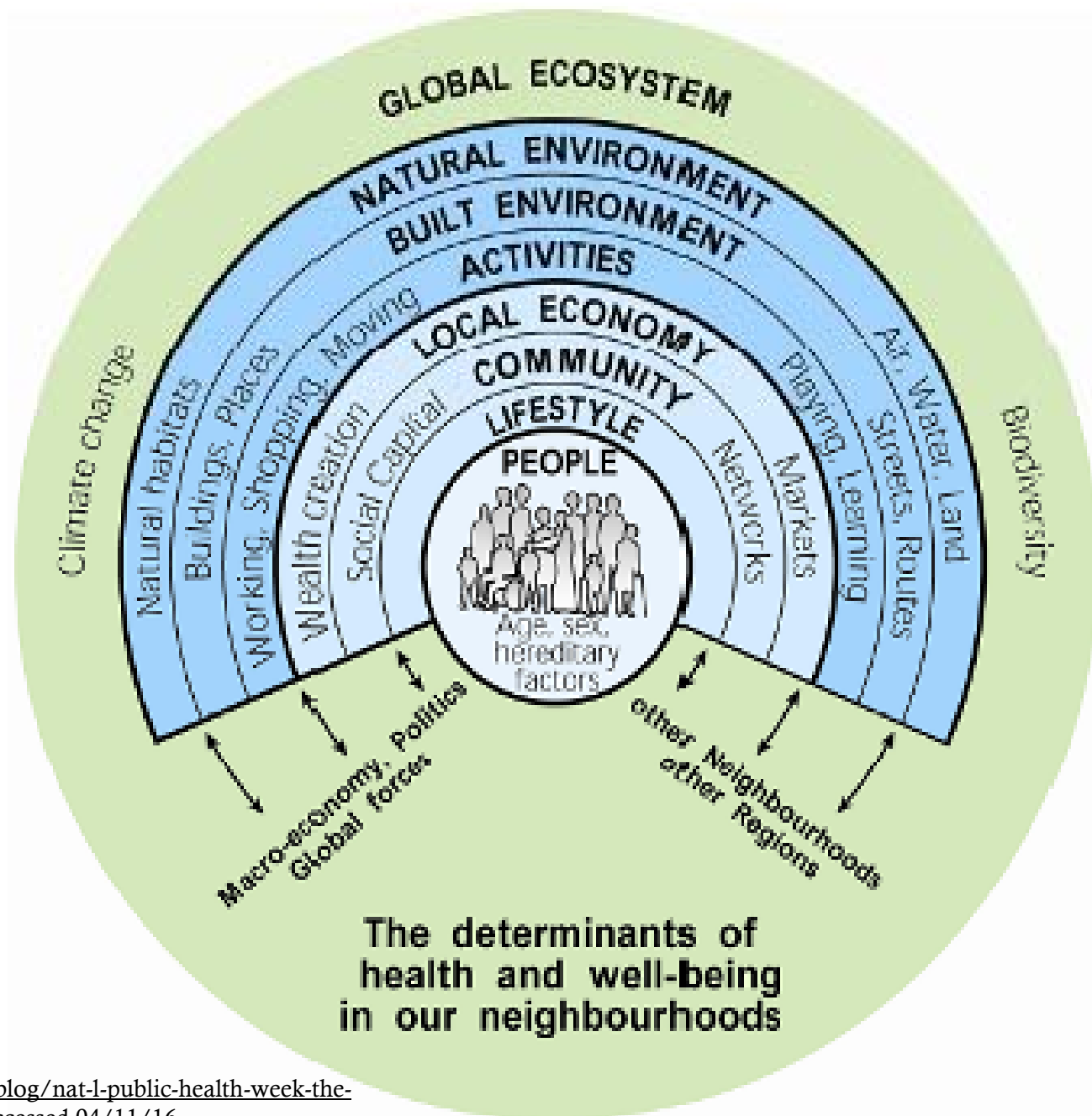
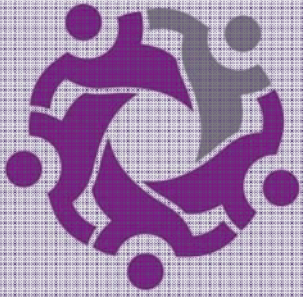
Benefits of Interdisciplinary Geriatric Assessment Teams

- Team includes various health care specialists
 - People over the age of 65 have an average of 5 chronic health problems. No single discipline can meet the multiple needs of these patients.
 - The team considers more options than do individual practitioners working alone.
 - Help to meet the needs of complex patients, can link to more services
 - Monitors and interacts with these complex patients and their families from multiple perspectives.
 - Older adults' goals and preferences are part of team care planning and decision making.



Benefits of Interdisciplinary Geriatric Assessment Teams

- Increased patient satisfaction with care
- Improved access to care
- Decreased length of hospital stays
- Improved treatment adherence
- Reduction in health care expenditures



Case Study: Mrs. Mable Evans**Part 1: Emergency Room Visit**

Mrs. Mable Evans is an 84 year old African American woman with history of multiple chronic conditions including arthritis, heart failure, atrial fibrillation, and urinary incontinence. She has had multiple emergency department visits due to shortness of breath (SOB), weakness and falls. Her primary care physician elected not to continue treating her due to the patient not following the physician's recommendations. The emergency room physician determines that Mrs. Evans would benefit from a more team-based approach to her care.

Part 2: Visit 1 in Primary Care

Mrs. Evans arrives 20 minutes late for her initial appointment with you. Her son dropped her off at the entrance. She tells you she just wants her hips and knees to stop hurting her. She has been having increasing difficulty doing her own household chores; she is no longer cooking as it hurts her to stay on her feet too long. She relies on her son to do the grocery shopping, and often he buys TV dinners and canned goods. She does not talk with anyone other than her son who lives with her. She would like to move somewhere else, but her family relies on her to help pay the rent and frequently asks to borrow money from her.

Part 3: Second visit 3 months later

Mrs. Evans returns for a follow up appointment. She is accompanied by her homemaker, Anna, who now is helping Mrs. Evans with grocery shopping and low salt meal preparations. She has not fallen since her last visit. She was discharged from home health nursing and physical therapy services one month ago. She reports improved balance and increased endurance. Anna encourages Mrs. Evans to perform her physical therapy exercises, which she does 3 times per week. The nurse taught Mrs. Evans how to fill the pillbox for the week to help keep track of her medications. Despite that, Mrs. Evans admits to skipping dose of her water pill, "It makes me pee too much." She is also embarrassed about her urinary incontinence.

Mrs. Evans tells you she cannot afford to buy all her medications; it is also difficult for her to go to her pharmacy to pick up the prescriptions. She wonders if she is eligible for any assistance programs since she has Medicaid.

Part 4: Third Visit 4 Months Later

Mrs. Evans returns for a follow up visit with her homemaker Anna. Anna pulls you to the side and tells you she is concerned about Mrs. Evans' alcohol intake. She was recently seen in the emergency room for falls, where she sustained a forehead laceration and cut her hand. Anna tells you it is because Mrs. Evans has been drinking almost daily.

The clinic social worker has been in regular communication with Mrs. Evans since her last visit with you to encourage her to attend Adult Day Services or to consider a volunteer to come to her home for additional social interaction. Mrs. Evans declined both suggestions.

Mrs. Evans was also recently hospitalized for heat exhaustion. Her electricity was turned off after failure to pay her bills for 6 months. She admits that her children are asking her more frequently for her social security check and becoming verbally abusive if she says no.

If you have difficulty accessing any of these resources, please email catch-on@rush.edu.



Teaching Academy Series

Adding a Health Equity Lens to Your Academic Scholarship Work

Raj C. Shah, MD

Associate Professor, Department of Family Medicine,
Rush Medical College

Lisa Barnes, PhD

Professor, Department of Neurological Sciences and
Behavioral Sciences, Rush Medical College

Tuesday, November 21, 2017 12-1pm
Armour Academic Center, Room 994



IT'S HOW MEDICINE

SHOULD BE

Objectives

- Describe the elements in recent models for health disparities
- Explain at least one mechanism for how health disparities may impact individuals
- Describe one way to add health disparity models into research aims or into course curriculum

Definitions

- Health

A state of complete physical, mental, and social well-being and not just the absence of sickness or frailty.

Source: Preamble to the Constitution of the World Health Organization as adopted by the International Health Conference, N.Y., 19-22 June, 1946; signed on 22 July 1946 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100) and entered into force on 7 April 1948.

Definitions

- **Determinants of Health**
- **Biology and genetics.** (i.e., sex and age)
- **Individual behavior.** (i.e. smoking)
- **Social environment.** (i.e. discrimination)
- **Physical environment.** (i.e. over-crowding)
- **Health services.** (i.e. no health insurance).

Source: U.S. Department of Health and Human Services, Healthy People 2020 Draft. 2009, U.S. Government Printing Office.

- **Health Inequality**

Differences, variations, and disparities in the health achievements of individuals and groups of people

Source: Kawachi, I., A glossary for health inequalities. *Journal of Epidemiology and Community Health*, 2002. **56**(9): p. 647

- **Health Disparity**

A type of difference in health that is closely linked with social or economic disadvantage. Disadvantages stem from characteristics historically linked to discrimination or exclusion such as race or ethnicity, religion, socioeconomic status, gender, mental health, sexual orientation, or geographic location. Other characteristics include cognitive, sensory, or physical disability.

- **Health Inequity**

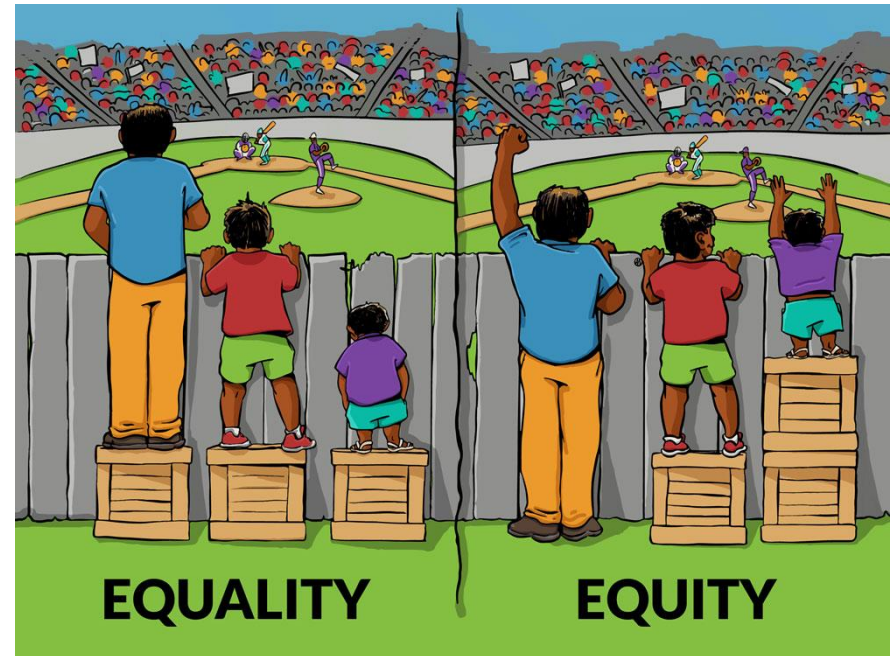
A difference or disparity in health outcomes that is systematic, avoidable, and unjust

Source: Braveman, P.A., Monitoring equity in health and healthcare: a conceptual framework. *Journal of health, population, and nutrition*, 2003. **21**(3): p. 181.

Definitions

- **Health Equity**

When all people have "the opportunity to 'attain their full health potential' and no one is 'disadvantaged from achieving this potential because of their social position or other socially determined circumstance' "



National Strategies

“The combined costs of health inequalities and premature death in the United States were \$1.24 trillion” between 2003 and 2006.

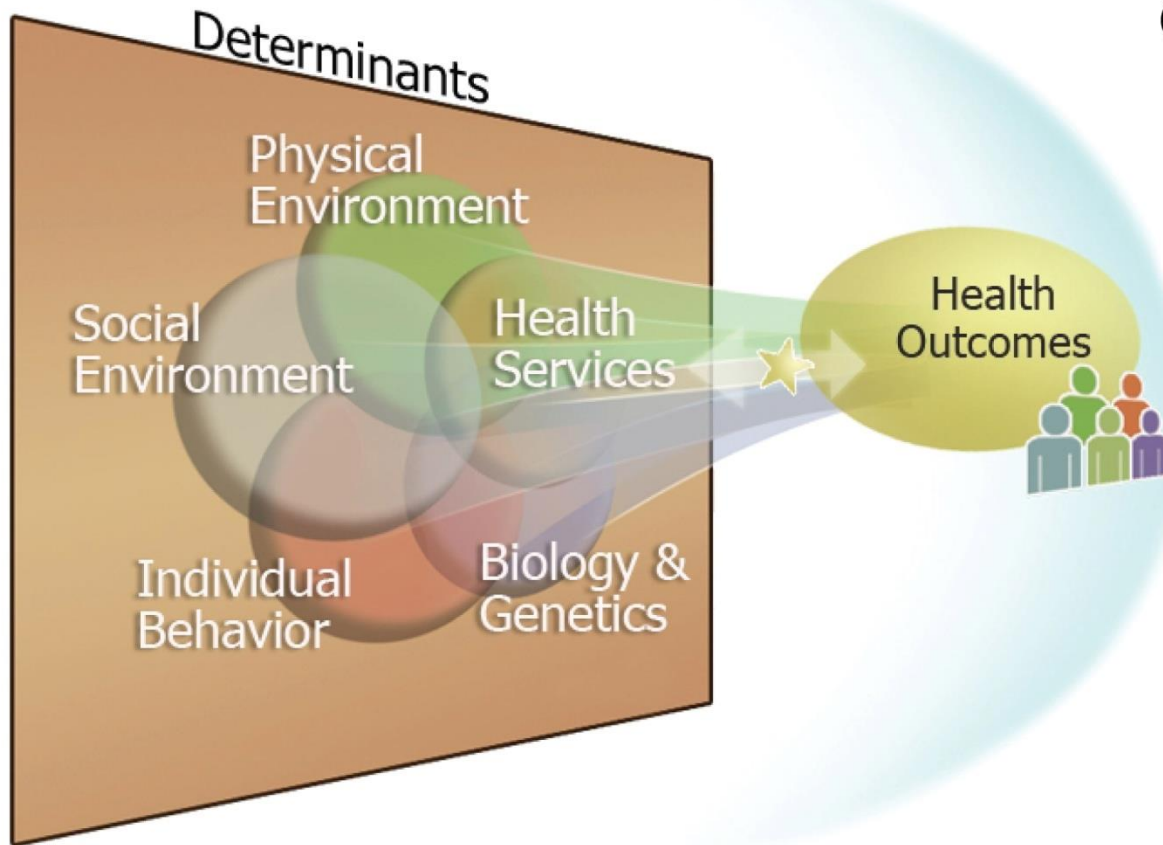
- A Resource for Promoting Health and Preventing Disease Throughout the Nation



Healthy People 2020

Healthy People 2020

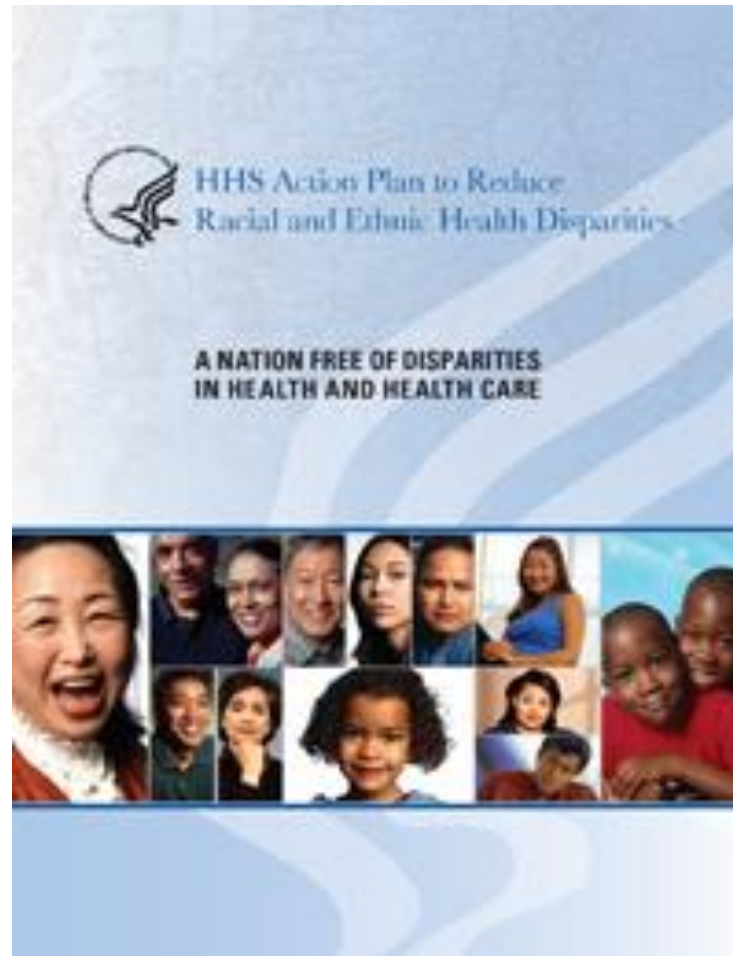
A society in which all people live long, healthy lives



Overarching Goals:

- Attain high quality, longer lives free of preventable disease, disability, injury, and premature death.
- Achieve health equity, eliminate disparities, and improve the health of all groups
- Create social and physical environments that promote good health for all.
- Promote quality of life, healthy development and healthy behaviors across all life stages.

National Health Strategies



"It is time to refocus, reinforce, and repeat the message that health disparities exist and that health equity benefits everyone."

– Kathleen G. Sebelius, Secretary,
Health & Human Services

"A nation free of disparities in health and health care."

Local Strategies



HEALTHY CHICAGO 2.0

PARTNERING TO IMPROVE HEALTH EQUITY

2016 - 2020

Health systems hope social initiatives will produce better health outcomes and lower costs

By Beth Kutscher | November 28, 2015 | Modern Healthcare

A small but growing group of not-for-profit hospitals and health systems are spending more money on nontraditional community benefit programs designed to address social determinants that affect health, including crime, education, housing, hunger, jobs, poverty and violence.

Many of these projects fall outside the conventional range of community benefit activities, such as free clinics and health screening events. Instead, their focus is on building healthier communities by bettering people's lives.

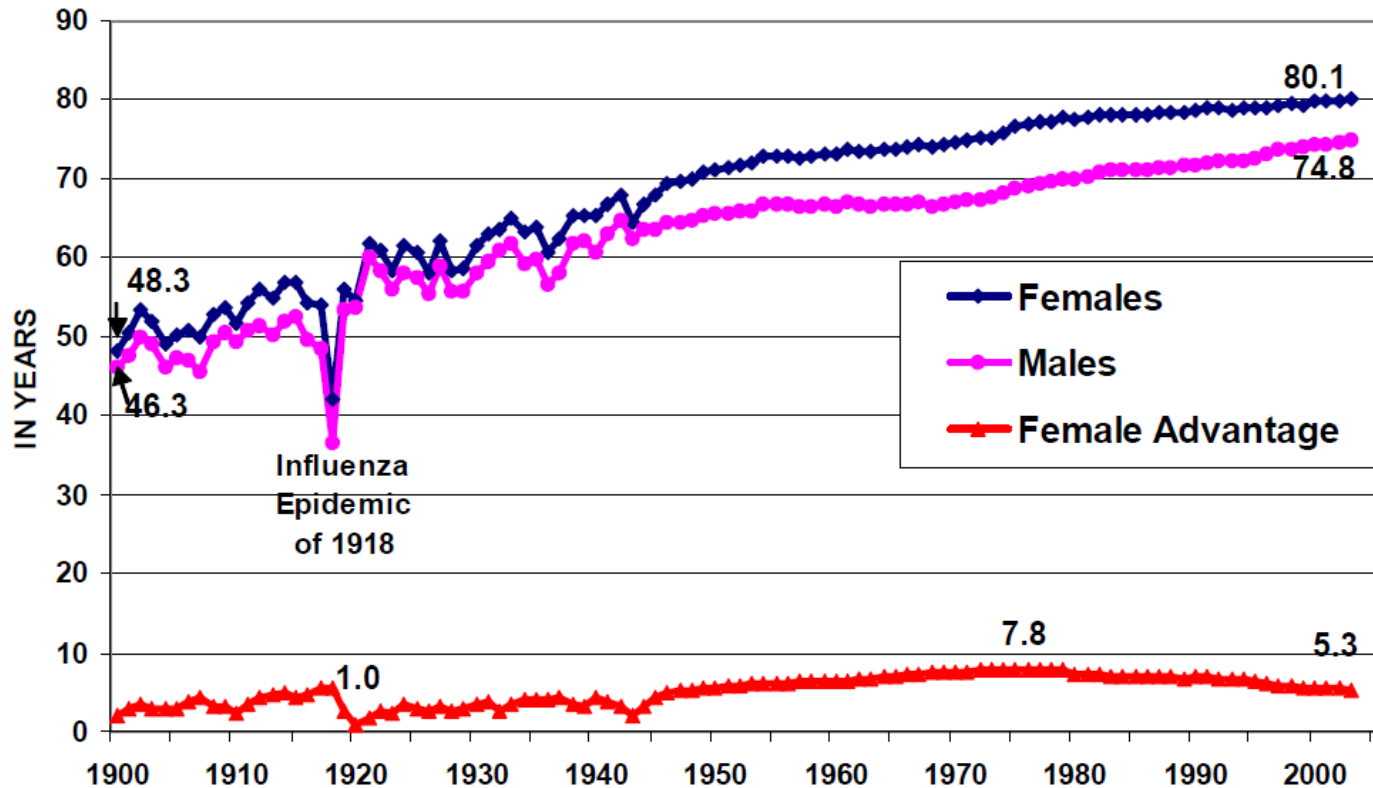
Rush Mission

The mission of Rush is to improve the health of the individuals and diverse communities we serve through the integration of outstanding patient care, education, research and community partnerships.

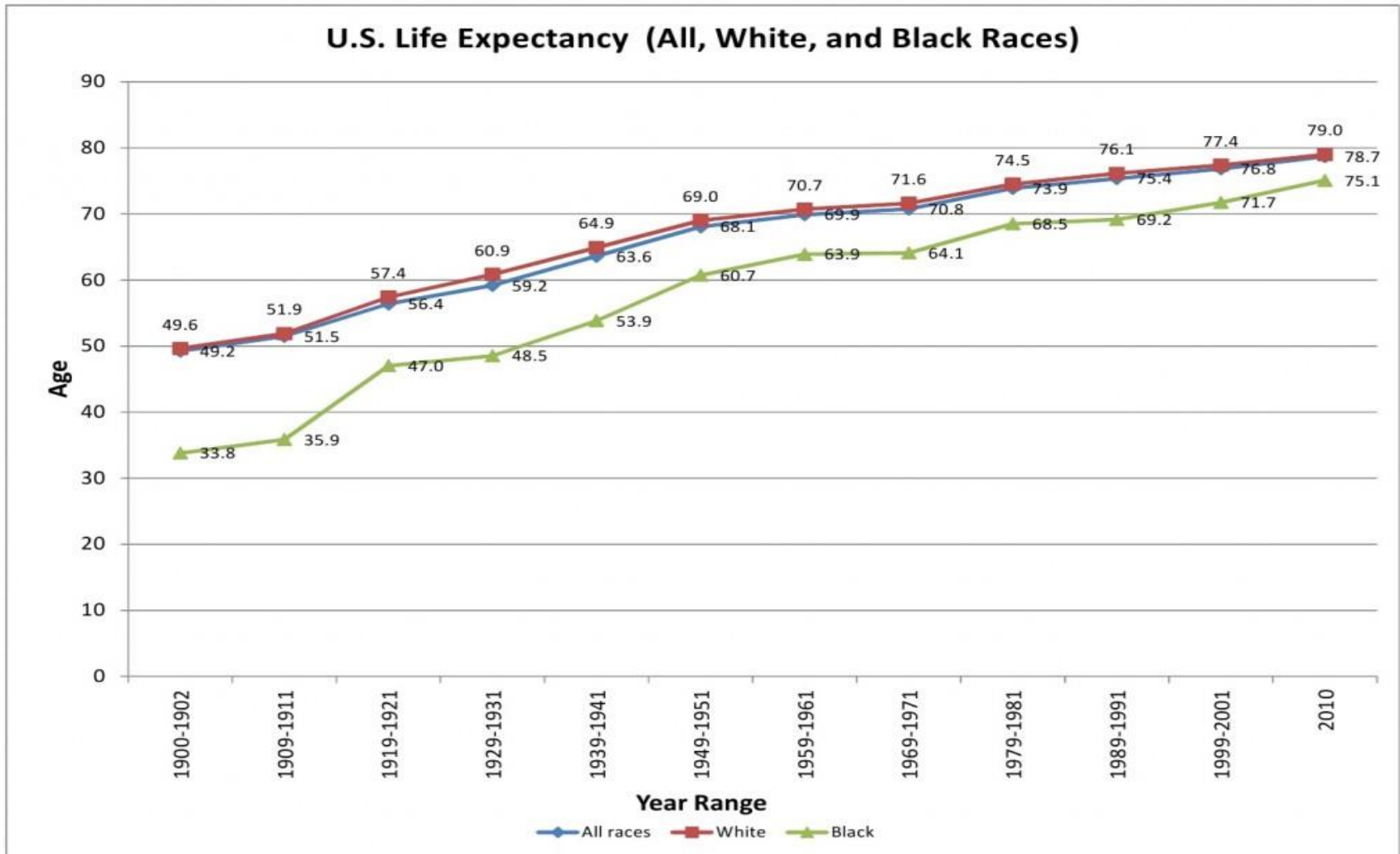


Health Disparities over Time, Space, and Social Gradients

Figure 1. Life Expectancy at Birth, by Sex: 1900 to 2003.

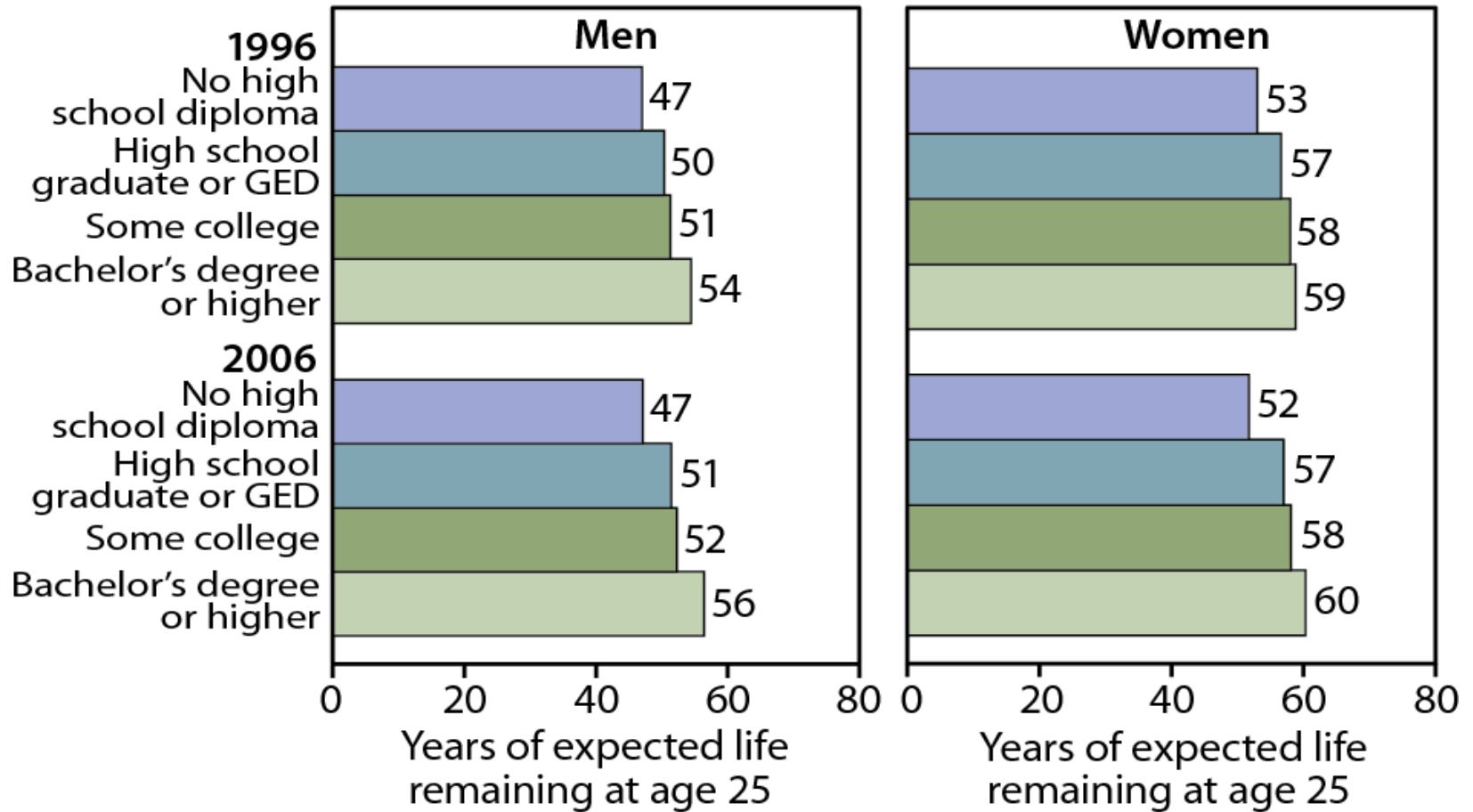


Source: For 1900-2002, CRS analysis based on data contained in NCHS, United States Life Tables, 2002, *National Vital Statistics Report*, vol. 53, no. 6, Nov. 10, 2004. For 2003, CRS analysis based on NCHS, Deaths: Final Data for 2003, *National Vital Statistics Report*, vol. 54, no. 13, Apr. 19, 2006.



Source: National Center for Health Statistics, 2011

Life expectancy at age 25



NOTE: GED is General Educational Development high school equivalency diploma.

SOURCE: CDC/NCHS, *Health, United States, 2011*, Figure 32. Data from the National Health Interview Survey Linked Mortality File.

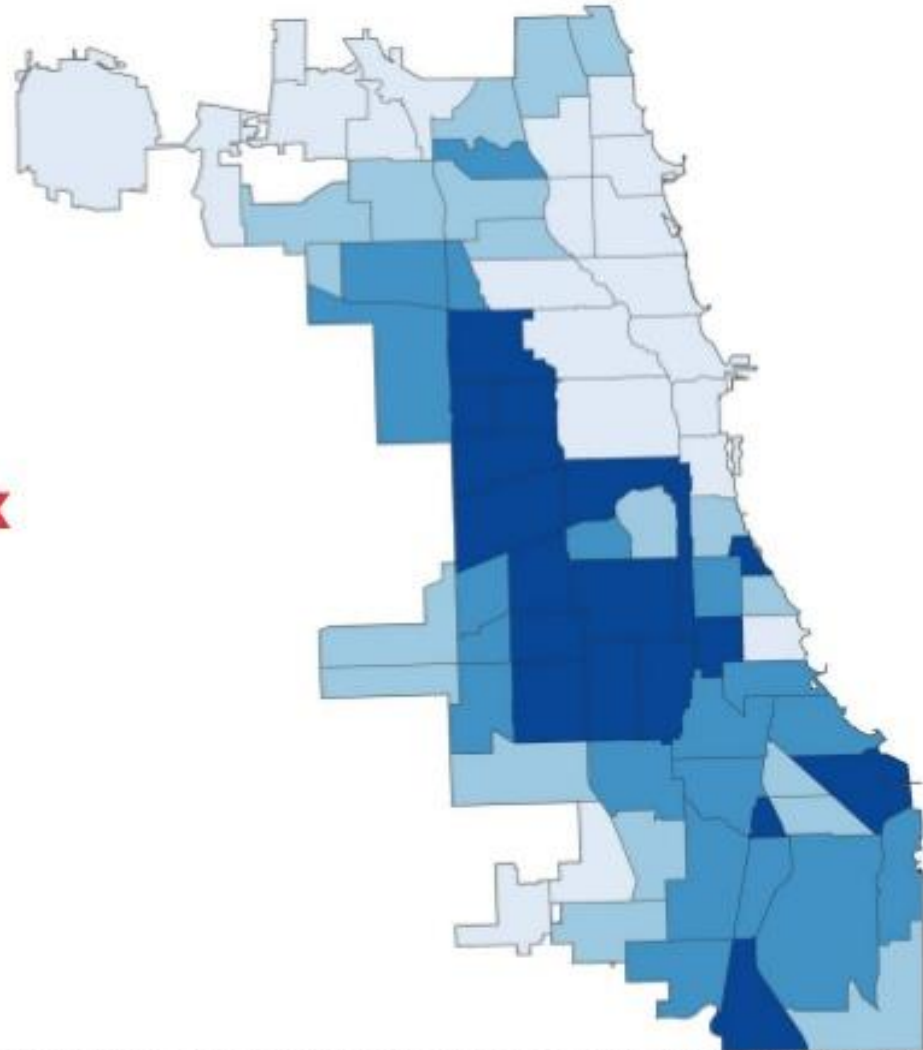
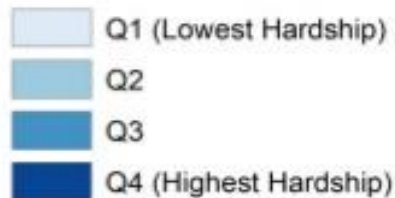
Hardship Index -- Chicago

Crowded Housing
Households Below Poverty
Unemployment
High School Graduation
Dependent Population
Income

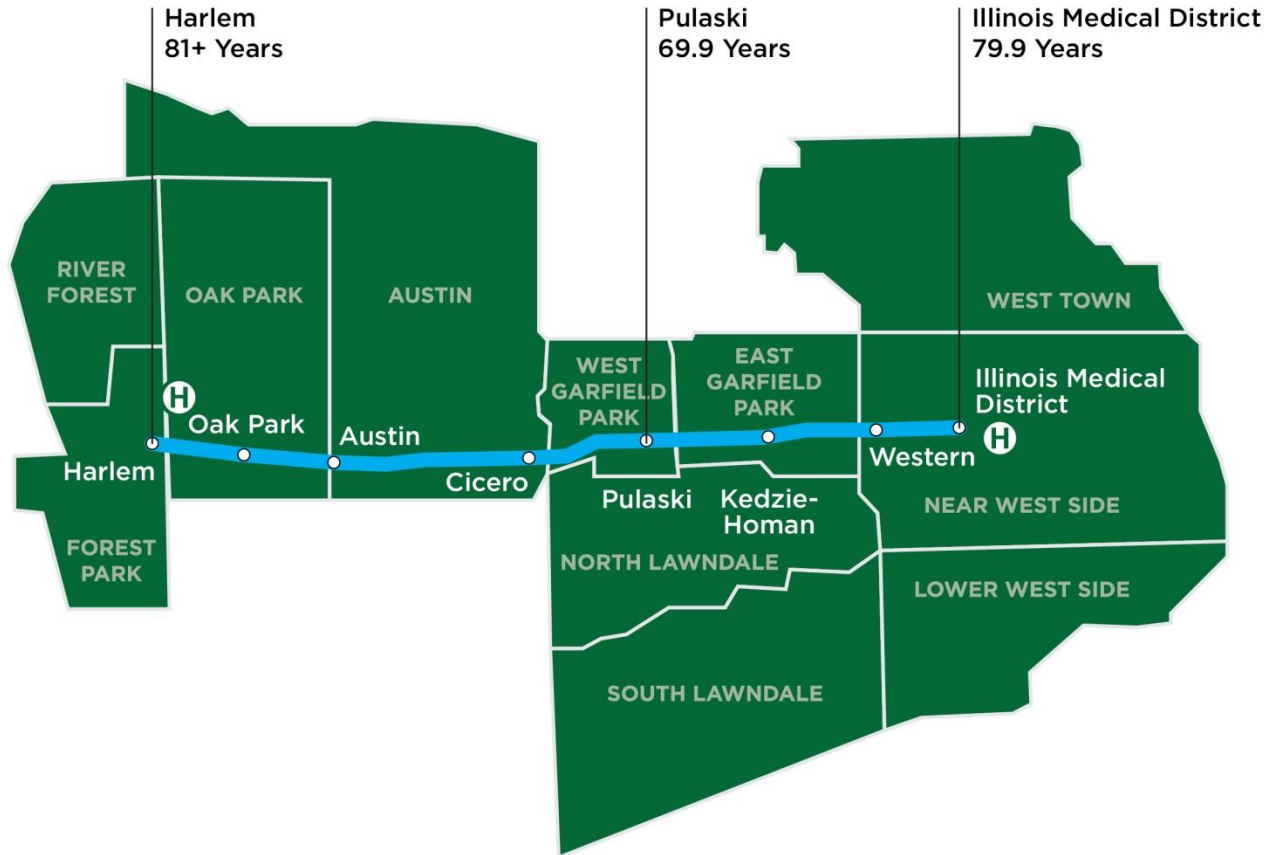
Hardship Index

(Range: 1 to 98)

Hardship Index Quartile

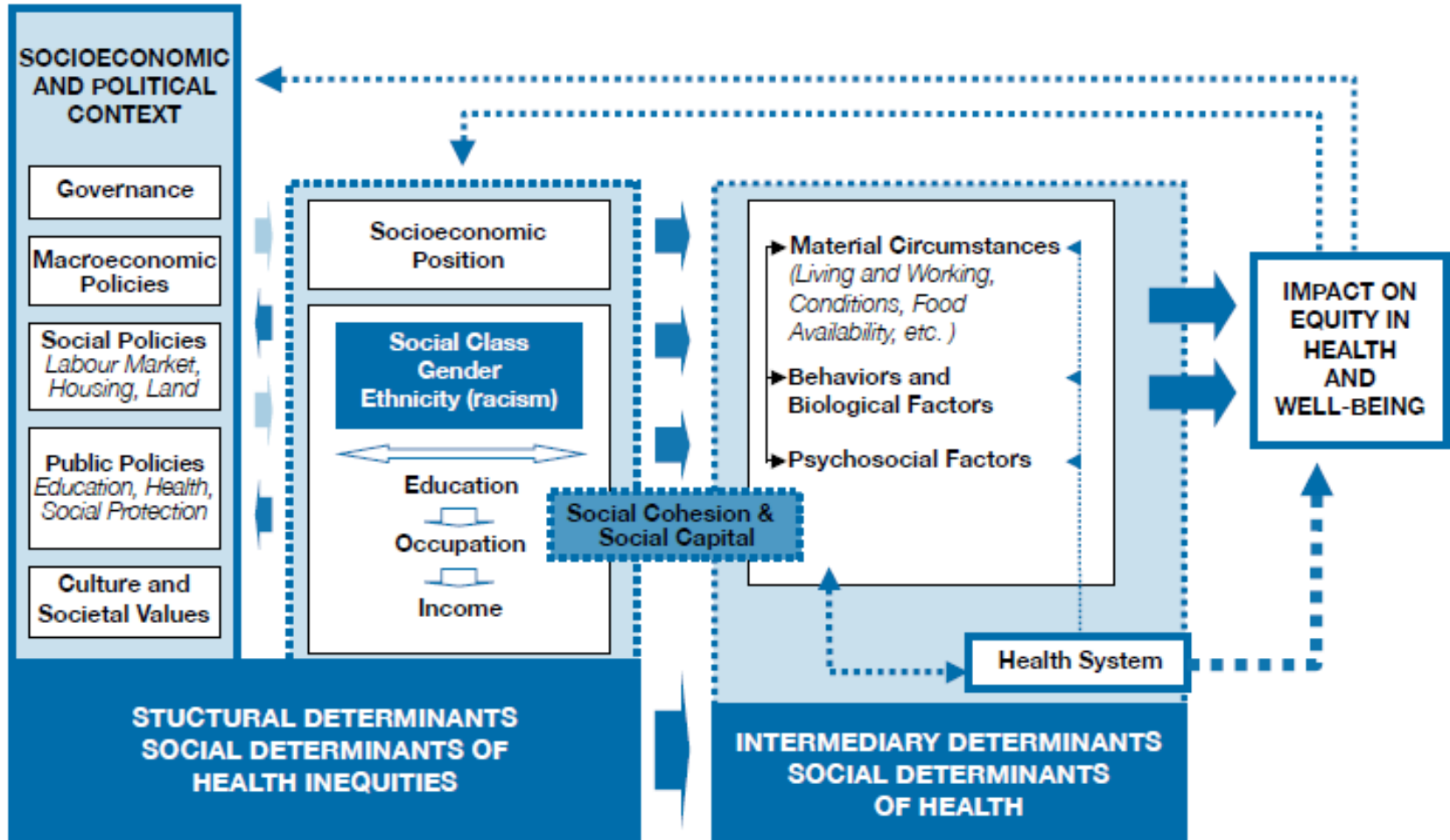


Rush Community Outcomes



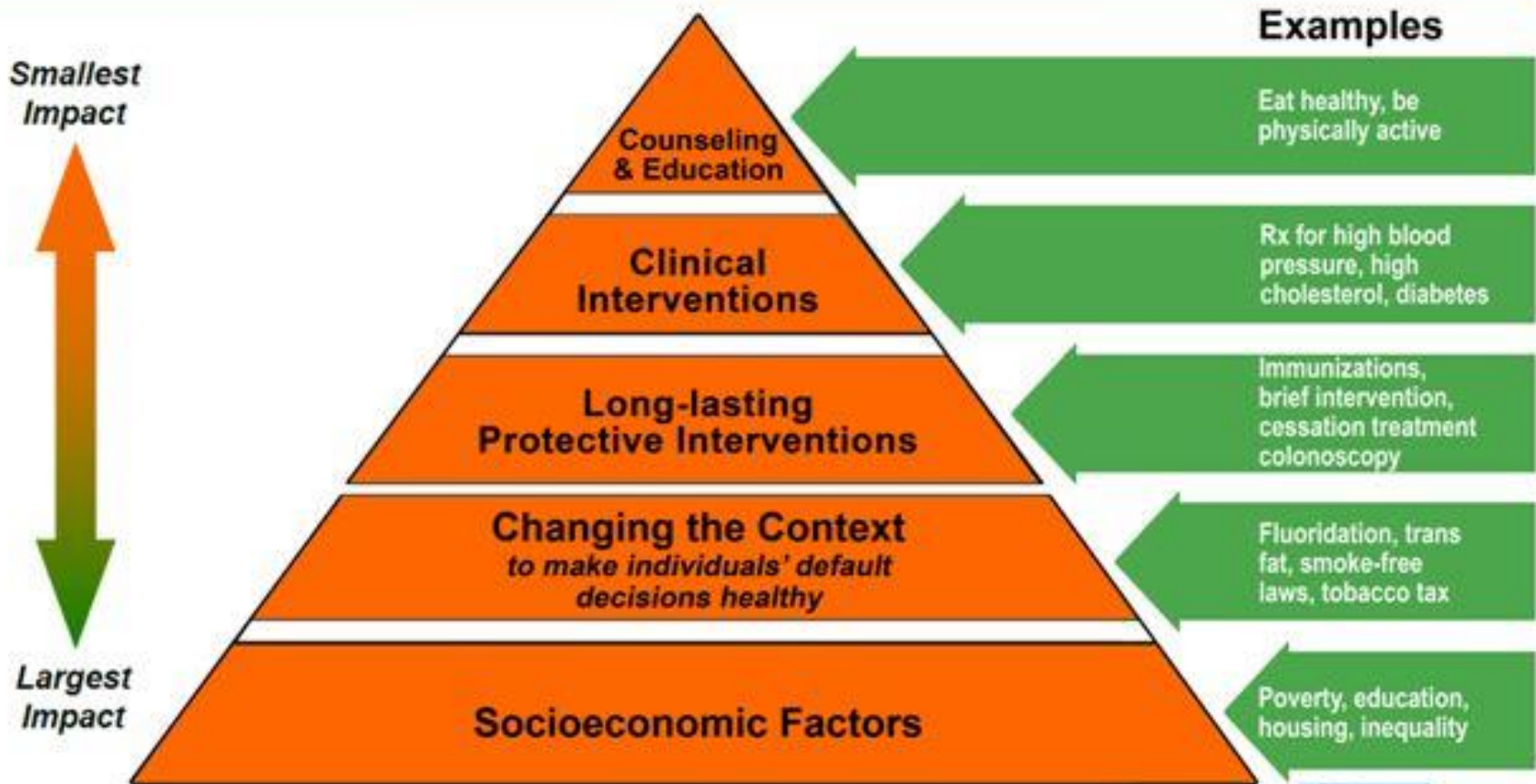
Frameworks

World Health Organization Framework



CDC Health Impact Pyramid

CDC Health Impact Pyramid *Factors that Affect Health*



Check the Tarrant County Public Health Web site to learn more.
<http://health.tarrantcounty.com>



NIMHD Minority Health and Health Disparities Research Framework
Health Disparity Populations: Race/Ethnicity, Low SES, Rural, Sexual/Gender Minority
Other Fundamental Characteristics: Sex/Gender, Disability, Geographic Region

| Domains of Influence | Levels | of | Influence | |
|-----------------------------------|---|--|--|--|
| | Individual | Interpersonal | Community | Societal |
| Biological | Biological Vulnerability and Mechanisms | Caregiver-Child Interaction Family Microbiome | Community Illness Exposure Herd Immunity | Sanitation Immunization Pathogen Exposure |
| Behavioral | Health Behaviors Coping Strategies | Family Functioning School/Work Functioning | Community Functioning | Policies and Laws |
| Physical/Built Environment | Personal Environment | Household Environment School/Work Environment | Community Environment Community Resources | Societal Structure |
| Sociocultural Environment | Sociodemographics Limited English Cultural Identity Response to Discrimination | Social Networks Family/Peer Norms Interpersonal Discrimination | Community Norms Local Structural Discrimination | Societal Norms Societal Structural Discrimination |
| Healthcare System | Insurance Coverage Health Literacy Treatment Preferences | Patient-Clinician Relationship Medical Decision-Making | Availability of Health Services Safety Net Services | Quality of Care HealthCare Policies |
| Health Outcomes | Individual Health | Family/Organizational Health | Community Health | Population Health |



NIA Health Disparities Research Framework

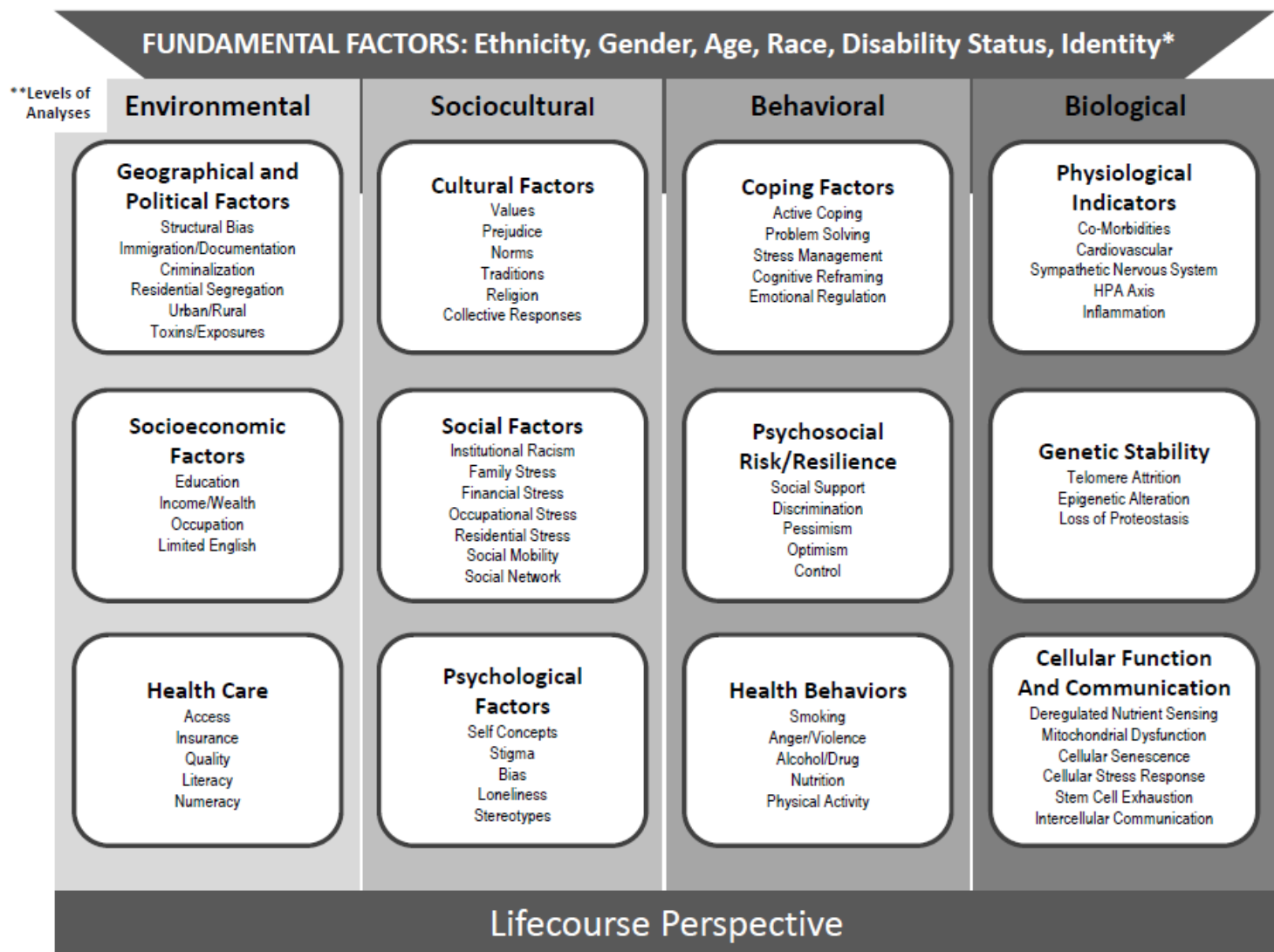


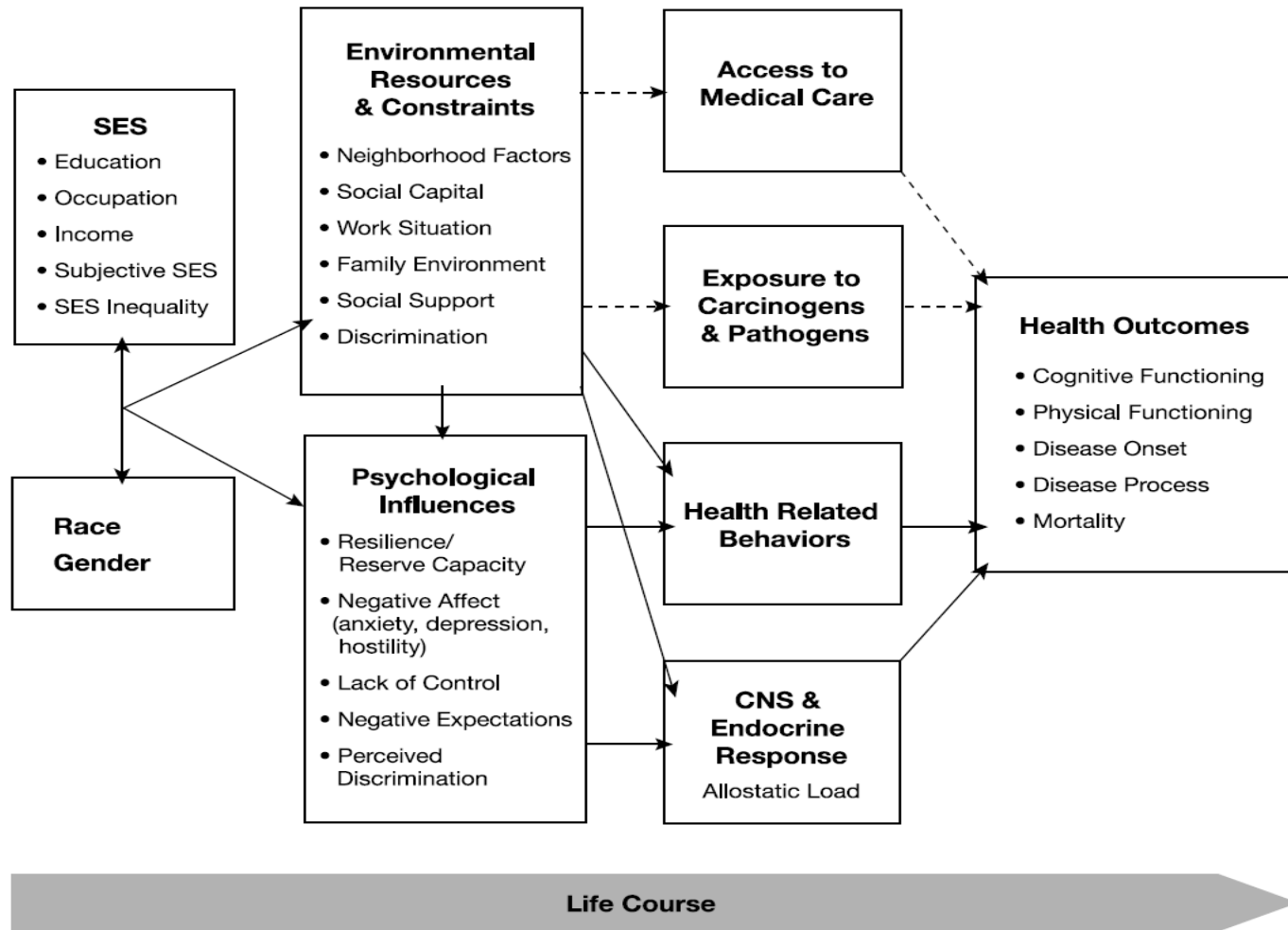
Figure 2. NIA Health Disparities Research Framework

* Sexual and gender minorities.

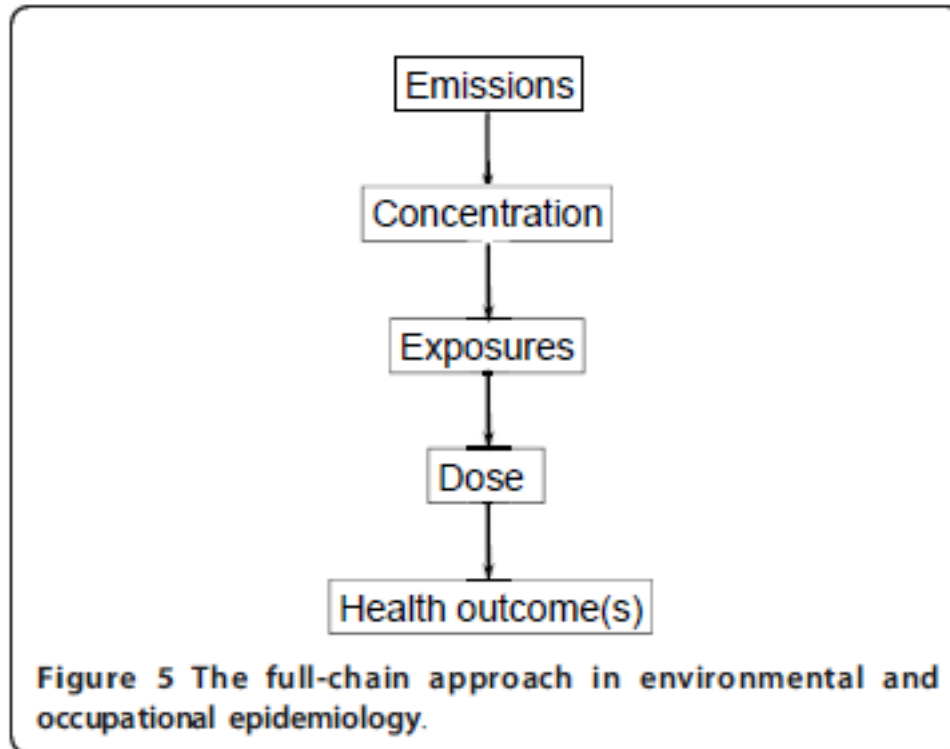
** Text within boxes represents examples of related factors.

Mechanisms: Why Social Determinants “ Get Under the Skin”

Mechanisms



Toxin Exposure



Allostatic Load

Allostasis refers to the adaptive processes that maintain homeostasis through the production of mediators such as adrenalin, cortisol and other chemical messengers. These mediators of the stress response promote adaptation in the aftermath of acute stress, but they also contribute to allostatic overload, the wear and tear on the body and brain that result from being “stressed out.”

McEwen, 2005

Mechanisms

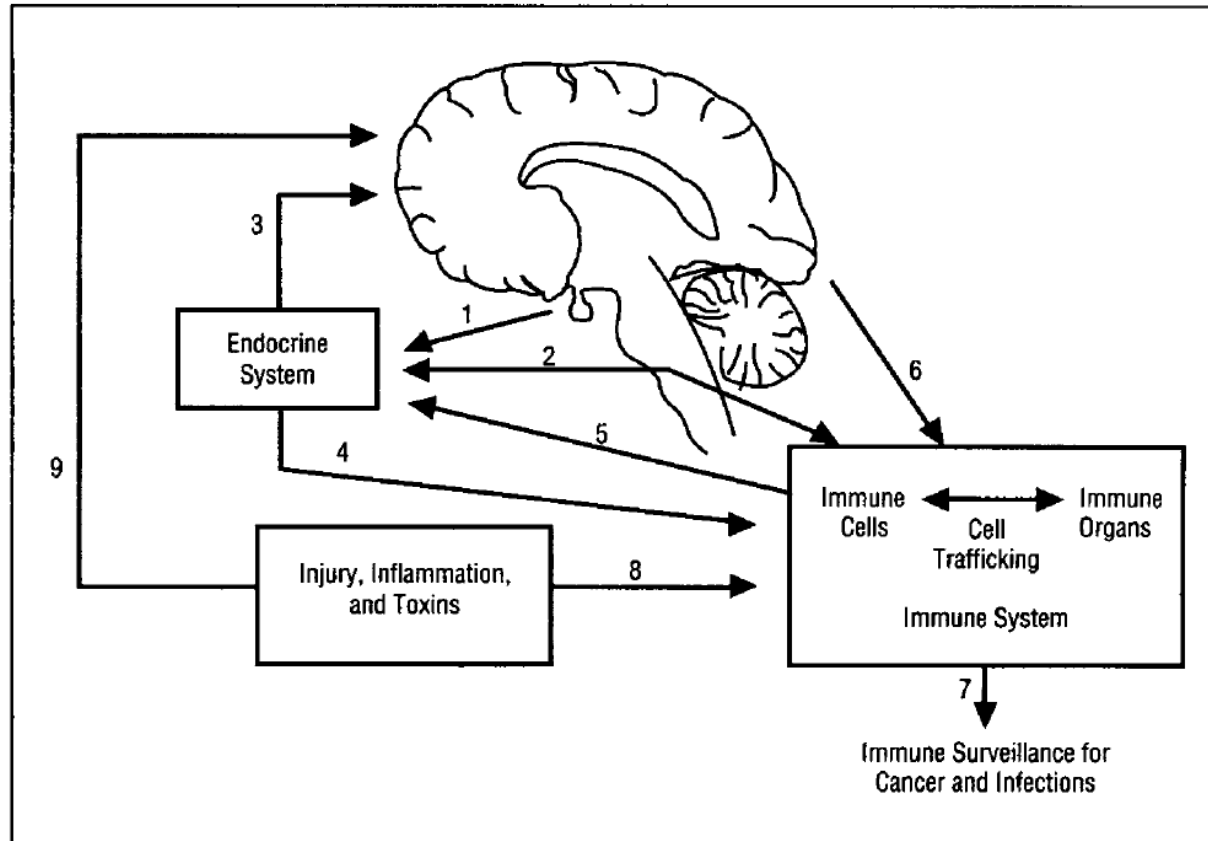
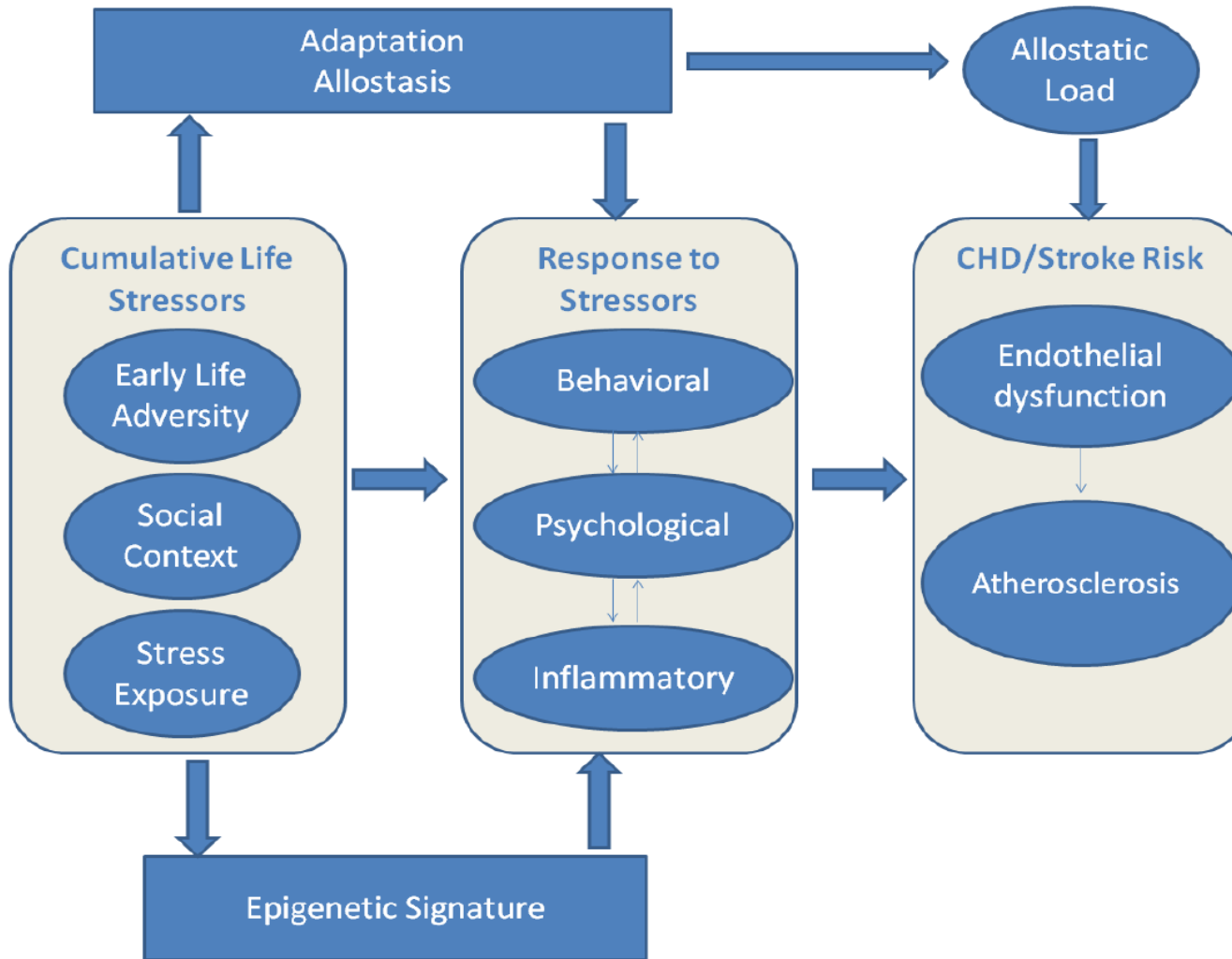


Figure 3. The brain and the endocrine and immune systems have complex interrelationships with each other in response to pathogens and tumor cells. (1) Neuroendocrine products control endocrine function; (2) neural activity also regulates endocrine function, as well as affecting the immune system; (3) hormones affect the brain and pituitary; (4) hormones also affect immune cells and organs; (5) immune system messengers (eg, cytokines, thymic hormones) affect endocrine function; (6) immune system messengers have direct and indirect effects on the pituitary gland and brain; (7) immune function, which includes the movement or "trafficking" of immune cells to various tissues and organs through the circulation and lymphatic system, performs surveillance against tumor cells and pathogens as well as foreign cells and substances; (8) injury, inflammation, and toxins from infection stimulate immunity as well as cytokine production; and (9) injury, inflammation, and toxins also signal the brain and pituitary gland.^{55,64}

Epigenetics

Epigenetic changes or *marks* refer to alterations in DNA or histone structure that do not affect the sequence of DNA but may affect gene expression and therefore cellular function. The effect on cellular function may be sustained, and under many circumstances, it can be transmitted to subsequent generations of cells.

Epigenetics



Conclusions

- Health equity is a key component for improving health in the United States.
- Health inequities cause significant suffering.
- Most work to date has been on describing health disparities.
- Scholarly work on why health disparities impact health and well-being is needed to achieve health equity.
- How can you use a health equity lens in our scholarly academic activities?

“Modern epidemiology is oriented to explaining and quantifying the bobbing of corks on the surface of waters, while largely disregarding the stronger undercurrents that determine where, on average, the cluster of corks ends up along the shoreline of risk.”

(McMichael, 1994)

Acknowledgements

- Center for Community Health Equity
(www.chicagohealthequity.org)
- Rush Center of Excellence on
Disparities in HIV and Aging (CEDHA)
(www.cedha.org)

Suggested Readings

- Lillie-Blanton M, Parsons PE, Gayle H, Dievler A. Racial differences in health: Not just Black and White, but shades of gray. *Annu Rev Public Health*. 1996;17(1):411-448.
- Adler NE, Snibbe AC. The role of psychosocial processes in explaining the gradient between socioeconomic status and health. *Current Directions in Psychological Science*. 2003;12(4):119-123.
- Farmer MM, Ferraro KF. Are racial disparities in health conditional on socioeconomic status? *Soc Sci Med*. 2005;60(1):191-204.
- Kawachi I, Daniels, N, Robinson DE. Health disparities by race and class: Why both matter. *Health Affairs*. 2005; 24(2); 343-352,
- Lillie-Blanton M, Brodie M, Rowland D, Altman D, McIntosh M. Race, ethnicity, and the health care system: Public perceptions and experiences. *Medical Care Research and Review*. 2000;57(4 suppl):218-235.
- Dovidio JF, Penner LA, Albrecht TL, Norton WE, Gaertner SL, Shelton JN. Disparities and distrust: The implications of psychological processes for understanding racial disparities in health and health care. *Soc Sci Med*. 2008;67(3):478-486
- Geronimus A. The weathering hypothesis and the relationship of maternal age to birth outcome: Evidence and speculations. *Ethnic Dis*. 1992;2:207-221.
- Hayward MD, Miles TP, Crimmins EM, Yang Y. The significance of socioeconomic status in explaining the racial gap in chronic health conditions. *Am Sociol Rev*. 2000;65(6):910-930
- Crimmins EM, Seeman TE. Integrating biology into the study of health disparities. *Population and Development Review*. 2004:89-107.
- Williams DR, Collins C. US socioeconomic and racial differences in health: Patterns and explanations. *Annual review of sociology*. 1995:349-386.

Contact Information

- Raj Shah, MD
Associate Professor, Family Medicine
and Rush Alzheimer's Disease Center
Rush University Medical Center
1750 West Harrison, Suite 1022
Chicago, IL 60612
Tel: (312) 563-2902
Fax: (312) 942-4154
E-mail: Raj_C_Shah@rush.edu

Contact Information

- Lisa L. Barnes, PhD
Professor, Neurological Sciences,
Behavioral Sciences, and Rush
Alzheimer's Disease Center
Rush University Medical Center
1750 West Harrison, Suite 1007
Chicago, IL 60612
Tel: (312) 942-2248
Fax: (312) 942-2297
E-mail: Lisa_L_Barnes@rush.edu

Example Case – without HD lens

- **Aim 1: To examine the relation of brain MRI indices with rate of cognitive decline.**
- Hypothesis: African Americans with more disruption of white matter integrity (e.g. higher FA, greater volume of white matter hyperintensities) will exhibit faster rates of global cognitive decline and perceptual speed than those with less disruption of white matter integrity
-
- **Aim 2: To examine the association of psychosocial and experiential risk factors with brain MRI indices.** Hypotheses: Early-life adversity, perceived stress, and inflammation, and harm avoidance will be associated with more disruption of white matter integrity; and higher purpose in life, cognitive activity, and greater social networks will be associated with less disruption of white matter integrity
-
- **Aim 3: To determine if brain MRI indices mediate the association of psychosocial and experiential risk factors with rate of decline.**
- Hypothesis: The association of risk factors with rate of decline will be partially or fully attenuated through brain MRI indices
-
- **Aim 4: Taking advantage of neuroimaging, risk factors, and cognitive function data available in Whites from the Rush Memory and Aging Project, test whether the associations of risk factors, MRI indices, and cognitive decline vary across race.**

Example Case – with HD lens

- **Aim 1: To examine the relation of change in brain MRI indices with rate of cognitive decline and risk of AD among older African Americans.**
- Hypothesis: AAs with decreased structural and functional brain integrity (e.g., loss of regional brain volume, progression of WMH, reduced functional connectivity) will exhibit faster rates of global cognitive decline, particularly in perceptual speed and have a higher risk of AD than those with no change in brain integrity.
-
- **Aim 2: To examine the relation of early and mid-life cultural risk factors with change in structural and functional brain MRI indices among older African Americans.**
- Hypotheses: Early-life adversity, perceived discrimination, occupational complexity, low emotional support, and burden of mid-life vascular risk will be associated with decreased brain structural and functional integrity.
-
- **Aim 3: To determine if change in brain MRI indices affects the relation of early- and mid-life risk factors to rate of decline and risk of AD among older African Americans.**
- Hypothesis: The addition of early and midlife risk factors with change in MRI will be a better predictor of cognitive decline and risk of AD than either risk factors or change in MRI alone.
-
- **Aim 4: To identify racial differences in the relation of change in MRI structural and functional brain integrity to cognitive decline. Taking advantage of neuroimaging and cognitive function data available at no cost, we will test the following hypothesis:**
- Hypothesis: The effects of structural and functional brain integrity loss on cognitive decline will differ between AAs and Whites.

ANNALS OF THE NEW YORK ACADEMY OF SCIENCES

Issue: *The Biology of Disadvantage***Health disparities across the lifespan: Meaning, methods, and mechanisms**Nancy E. Adler¹ and Judith Stewart²¹Departments of Psychiatry and Pediatrics, and Center for Health and Community, University of California, San Francisco, CA, USA. ²Department of Psychiatry, University of California, San Francisco, CA, USA

Address for correspondence: Nancy E. Adler, University of California, San Francisco, 3333 California Street, Suite 465, San Francisco, CA, USA. nancy.adler@ucsf.edu

Over the past two decades, exponential growth of empirical research has fueled markedly increased concern about health disparities. In this paper, we show the progression of research on socioeconomic status (SES) and health through several eras. The first era reflected an implicit threshold model of the association of poverty and health. The second era produced evidence for a graded association between SES and health where each improvement in education, income, occupation, or wealth is associated with better health outcomes. Moving from description of the association to exploration of pathways, the third era focused on mechanisms linking SES and health, whereas the fourth era expanded on mechanisms to consider multilevel influences, and a fifth era added a focus on interactions among factors, not just their main effects or contributions as mediators. Questions from earlier eras remain active areas of research, while later eras add depth and complexity.

Keywords: health disparities; gradient; mechanism; pathways; stress

Health disparities have become of central concern in the United States and globally. Populations within the United States experience marked differences in health and longevity. Differences among racial and ethnic groups are pronounced; for example, about twice as many Blacks and Hispanics report being in fair or poor health than do Whites. Differences are even greater by SES; almost five times as many adults in poverty report fair or poor health compared to those with the highest income.¹ Income inequality has increased in the United States over the past 30 years due to differential change in real family income. In 1979, the top 5% of families had average incomes that were 11.4 times larger than that of the bottom 20%; however, by 2005, the ratio had risen to 20.9 times greater.² During this period, real income fell slightly for those at the bottom while skyrocketing for those at the top. From the lowest to the highest income quintiles, the changes in income were -1%, 9%, 15%, 25%, and 53%, respectively.³

These trends have raised alarm about the impact of a skewed distribution of societal resources on so-

cial and physical well-being. Public health officials have called attention to this problem and pledged to reduce it. Healthy People 2010 that was released in January, 2000 and set goals for the health of the United States in the first decade of the 21st century, had two overarching goals: (1) to increase the quality and years of healthy life; and (2) to eliminate health disparities which were defined as “differences that occur by gender, race or ethnicity, education or income, disability, geographic location, or sexual orientation” (p. 11).⁴

A midcourse review of progress toward achievement of Healthy People 2010 goals is sobering. Despite an explosion of research, and increasing life expectancy, significant differences remain along racial and ethnic, and socioeconomic (SES) lines.⁵ Progress was measured in 28 focus areas with 467 specific objectives (e.g., increase the proportion of adolescents who participate in daily school physical education, decrease the proportion consuming more than 10% of calories from saturated fat). Disparities in health between racial and ethnic groups

have lessened for some objectives, but these gains have been partially offset by increases in disparities on other objectives. For 195 objectives and sub-objectives with trend data for racial and ethnic groups, 14 showed increases in disparities and 24 showed decreases. Data on changes in disparities due to education or income are lacking for many Healthy People 2010 objectives but the few available indicators show even more discouraging trends; disparities among educational groups decreased for three objectives or sub-objectives but increased for 14, and there were few changes in disparities for income groups. We are clearly not going to eliminate health disparities by 2010, and there is some question whether we will have reduced them in any meaningful way or if some will actually have increased. This adds urgency to the need to understand how disparities emerge and how they can be eliminated.

Defining health disparities

Although eliminating health disparities is a frequently voiced aspiration, there is little consensus on its definition.⁶ Health disparities frequently refer to disparities in health care, including differential access to screening and/or treatment options, or unequal availability of culturally or linguistically knowledgeable and sensitive health personnel. It is also used in the United States to refer to differences in health care or health status among different racial and ethnic groups, whereas in the United Kingdom and European nations it more frequently refers to differences associated with social class and socioeconomic status (SES). Despite their differences, most definitions share a common element of identifying a disparity as a difference in health status between social groups (e.g., socioeconomic, racial/ethnic, gender) that is not only unnecessary and avoidable, but in addition, is considered unfair and unjust.⁷ In recent years, the term “health inequities” has been used more frequently, emphasizing the injustice of the difference in health status. Because the definition of health disparities includes the characteristic of injustice, we use the terms “health disparities” and “health inequalities” interchangeably in this volume. In addition, to maintain continuity with our previous work, the former term is primarily used.

In the following papers, we examine differences in health status associated with SES and associated disadvantage, and the biological processes responsible

for these outcomes. Socioeconomic deprivation is a key mechanism through which other bases of social disadvantage, particularly those linked to race and ethnicity, result in poorer health status.⁸ Health disparities associated with race and ethnicity receive more attention in the United States for a number of reasons, including greater availability of data on racial and ethnic differences in health and receipt of health care services than on social class differences. The United States is unlike most other countries in its failure to collect health statistics regarding social class.⁸ As a result, as Isaacs and Schroeder⁹ have observed, class is an “ignored determinant” of the nation’s health.

Evolution of health disparities research in the United States

Interest in health disparities has grown geometrically over the past 20 years. A primary contributor to this surge is the persistence of health disparities despite improvements in medical care and public health prevention initiatives. The number of studies on disparities associated with SES as well as by race/ethnicity has increased dramatically. Researchers are asking more complex questions, and using more sophisticated approaches and methods. Within the last 20 years, one can identify several distinct eras of work on health disparities associated with SES. New questions addressed in later eras of research did not replace the need for further work on questions posed in prior eras, but often added new complexity and depth to the questions and/or the methods for answering them. The first era used a threshold framework; poverty was conceptualized as a categorical determinant of health. The second era added greater nuance in examining graded associations between health status and socioeconomic resources resulting from higher education, income, and occupational status across the entire SES hierarchy, and began to consider how socioeconomic position intersected with social disadvantage associated with gender and with race/ethnicity. The third era began to identify mechanisms linking SES and health, attempting to discover the intermediate processes accounting for the graded relationship observed in the studies of the second era. The fourth era added the complexity of multilevel effects, such as the independent contribution of neighborhood characteristics above and beyond those of individuals’ own socioeconomic

characteristics. And an emerging fifth era is looking at interactions among such factors, not simply their main effects. Such work is looking, for example, at how the impact of individual SES is modified by neighborhood environments.

First era: poverty as threshold

The first era of research occurred before there was an explicit discussion of “health disparities.” The strong relationship between SES and health has been observed for centuries and in many countries.^{10–12} Earlier observations, conceptual frameworks, and methods of analysis foreshadow the evolution of work on health disparities that has occurred during the last 20 years in the United States, as well as the continuing debate over what lens to use to view the problem.

The importance of socioeconomic conditions for health was explicitly studied in the 19th century. William Farr worked for over 40 years to document the socioeconomic differences in disease in England.¹³ In the mid-1800s, Rudolf Virchow¹⁴ identified poverty and unemployment, lack of education, and political disenfranchisement as essential sources of disease. At the end of the century, Durkheim¹⁵ discussed differences in suicide rates as a social rather than individual phenomenon. Friedrich Engels¹⁶ saw poverty and unemployment as fostering ill-health, and placed primary responsibility on the “upstream” force of the political economy of Victorian England. This thread has been carried forward by current day scholars including Doyal,¹⁷ Link & Phelan,¹⁸ Navarro,¹⁹ Townsend,²⁰ Tesh,²¹ and Kreiger,²² who argue for examination of the societal processes that create the socioeconomic conditions that result in health disparities.

Twentieth century theory and research provided a foundation for studies on the cascade of factors resulting from socioeconomic position and their impact on health. The bio-psycho-social model formulated by George Engel²³ hypothesized that a variety of pathogens, including psychosocial factors such as stressors and life styles, combine to foster disease. This conceptualization provided a framework for multilevel analysis and research on processes such as cumulative risk and allostatic load (see Evans and Kim and McEwen and Gianaros, in this volume). Medical sociologist Aaron Antonovsky^{24,25} added another dimension through his exploration

of factors that help people to cope successfully with the unavoidable stressors in life. This work developed the concept of “salutogenesis” and emphasized the importance of a “sense of coherence”—comprehending, managing, and seeing meaning. While Antonovsky’s work was based on individual functioning, it also provided an intellectual precursor to research on the health-promoting (or, in Antonovsky’s words, “salutogenic”) aspects of social environments that can mediate or buffer effects of low SES (see Matthews, Gallo, and Taylor, in this volume). At the social level this extends to concepts of social capital and neighborhood cohesion (see Diez Roux and Mair, in this volume).

In the second half of the 20th century, empirical work done by Kitagawa & Hauser²⁶ examined associations of mortality with both income and education in a nationally representative sample of the U.S. population. This work signaled increased quantitative interest in the relationship between social factors and health. Kitagawa and Hauser found monotonic inverse relationships of income and education with mortality which were independent of one another, and found that the association was stronger for adults age 25–64 than for those over age 65. The Black Report in England²⁷ documented increasing disparities in mortality by social class despite the establishment of the National Health Service. This unexpected finding was attributed to growing inequality in England over the period examined and the impact of material hardship among the disadvantaged.

With the notable exception of Kitagawa and Hauser, the vast majority of research before the mid-1980s on socioeconomic contributors to health in the United States did not examine income as a continuum but focused on poverty.²⁸ The most common study design involved a comparison of health status or mortality for individuals whose individual or household income fell below the federal poverty line compared with those who were above this line. The underlying assumption was that a meaningful threshold was crossed when a person moved out of poverty and that differences in morbidity and mortality were due to material deprivation. In this model, increasing income below the poverty line impacts health up to the point where income becomes sufficient to move the individual or family out of poverty, at which point further increases in income have little or no effect on health. The socioeconomic

variables of education or occupational status were not as often studied in this era and this work was not explicitly conceptualized or framed in terms of disparities.

There was also substantial research on racial differences in health in this era. Most of the research documented differences between blacks and whites. There was little examination, however, of the relationship of race and SES or appreciation of the fact that racial prejudice and discriminatory policies relegated a higher proportion of blacks to lower rungs of the SES ladder. Subsequent studies have shown that socioeconomic disadvantage accounts for some, but not all, of the racial differences in health^{8,29,30} (see Williams et al., in this volume). In this earlier era, although most studies made either SES or race/ethnicity the primary focus, with only passing attention to adequate measurement and tracking of the other. There was also relatively little research on the health status of other racial and ethnic groups.

Convincing data on the link between poverty and higher mortality fueled interest in the impact of financial resources on health. The few studies that looked above the poverty line found that the influence of socioeconomic position on health continued to operate. These findings suggested that it might not only be extreme material privations associated with poverty that had health effects but other factors associated with SES. These observations did not cohere into a concerted research focus however until late in the century.

Second era: gradients

In response to the empirical work linking SES to health a second era of work arose during the mid-1980s. Although we term this a second era, it is actually the beginning of work undertaken with an explicit framing of “health disparities.” The Whitehall studies of civil servants galvanized interest in the power of socioeconomic forces and ushered in this new era.^{31–33} The powerful unexpected finding from the first Whitehall Study was that there was a monotonic relationship of occupational grade and health at all levels of the occupational hierarchy. Not only did those at the bottom of the occupational grades have worse health and higher mortality than those above them, but, in addition, improvements in health and longevity were observed at each succes-

sive step up the occupational grades, all the way up to the highest level. These findings were particularly notable since they occurred within a population in which all participants were employed and living well above the poverty line. It challenged the assumption of a threshold of income above which increasing resources would not benefit health. The results also challenged the view that social class differences in health resulted solely from material privation, and initiated a debate which became more vocal in the third era

A second aspect of the Whitehall study also helped galvanize interest in health disparities. The glaring problem of lack of universal health care in the United States has been a focus of intense concern and debate for some time. The dominance of this issue suggests an implicit assumption that universal coverage will solve the problem of disparities. Although the Black Report²⁷ had shown this not to be the case in England, results from the Whitehall studies reinforced those findings. The fact that substantial differences in morbidity and mortality were found across the SES hierarchy despite the availability of health care for all the Whitehall participants, ruled out differential health care as a major factor in determining disparities in mortality.

The powerful findings from the Whitehall studies spurred investigators to see if a similar gradient would be found in the United States. This was challenging to do using existing data sets because most did not have data that were sufficiently detailed to evaluate gradients. As noted earlier, most studies coded people only in terms of whether they were above or below the poverty line. Despite this, a number of papers reported gradients in disease prevalence and mortality rates.^{34–36} In addition, Pappas *et al.*³⁷ demonstrated that the gap in mortality between richer and poorer individuals and between those with more or less education, had increased between 1960, when Kitagawa and Hauser did their analysis, and 1986. The findings echo the focus in the first era on the importance of poverty, as the steepest drop in mortality occurs as income increases at the very bottom of the income distribution (see Fig. 1). At the same time, mortality continues to drop as income increases even well into higher levels³⁸ (see Dow and Rehkopf, in this volume).

The studies described earlier demonstrated the SES-health gradient in adults. During this era,

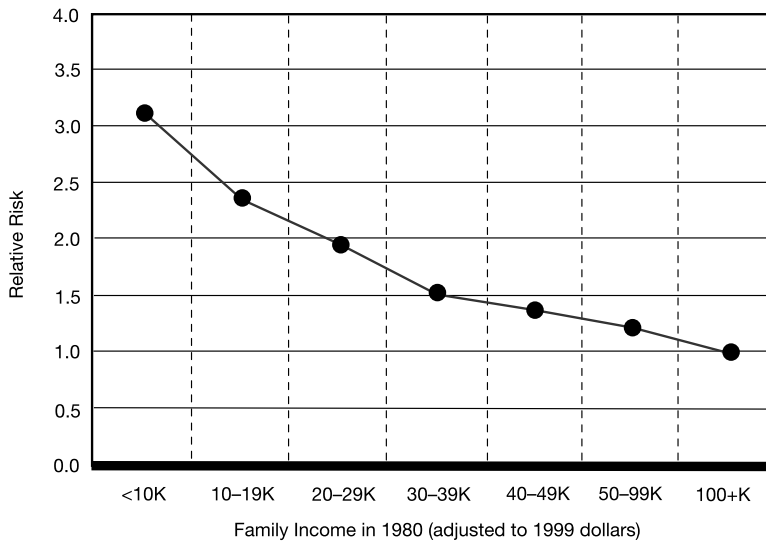


Figure 1. Relative risk of premature death \times family income (U.S. population). Age- and sex-adjusted relative risk of dying prior to age 65 based on nine-year mortality data from the National Longitudinal Mortality Survey.

studies also revealed that gradients emerge early in life. The lower the SES of a child's parents, the more likely the child is to experience a number of health problems, including injury, asthma, ear disease, limiting chronic conditions, and physical inactivity³⁹ (see Cohen *et al.*, in this volume.) The accumulation of social disadvantage is linked to poorer health among children^{40,41} (see Evans and Kim, in this volume). Among children in the 1994 and 1995 National Health Interview Survey Disability Supplement, for example, greater accumulation of family indicators of low SES were associated with greater odds that children would not be in very good or excellent health, would have a chronic condition, or would have an activity limitation. Controlling for health insurance did not affect the findings.⁴²

Although evidence about gradients among both children and adults emerged primarily in this second era, work continues to establish the strength and shape of the gradient at different ages. The period of life in which health disparities are the greatest is middle adulthood (age 40–65); disparities at this life stage may reflect the cumulative effects of differential exposures associated with socioeconomic disadvantage over the prior lifecourse. Disparities narrow after age 65, although the reasons for this have not been established. Safety nets, including Social Security and Medicare, which become active at

this age, may account for some degree of narrowing. Alternately, differential selection of those who have survived to age 65 in populations that have experienced more or less adverse conditions over their lifetime may also contribute to the narrower gap. Although diminished, the gradient does not disappear, however, and has been found in older populations. For example, Minkler *et al.*⁴³ found a social-class gradient in functional limitations for both men and women between the ages of 55 and 84 (but not beyond), which was present even at the upper rungs of the socioeconomic ladder.

Questions remain about the steepness of the gradient within childhood and adolescence. There is a clear gradient between SES and early fetal and neonatal loss.⁴⁴ However, once infants survive this period, socioeconomic differences in health are much smaller. While some report that differences become negligible as children enter adolescence,⁴⁵ there are conflicting findings. For example, Case *et al.*⁴⁶ found an increasingly steep gradient between family income and health as children get older. One reason for conflicting findings may be the use of different health indicators. The strength and patterning of the gradient differs depending on the outcome being examined. For some health problems, there is an increasingly steep gradient over childhood and adolescence (the cumulative model as reported by Case *et al.*),⁴⁶ for other health outcomes, the

gradient decreases (the convergence model, as reported by West).⁴⁵ Sample composition and variable calculations can also result in conflicting findings^{47,48} (see Cohen *et al.*, in this volume for a further discussion of associated conceptual models).

Research establishing the gradient relationship between SES and health is primarily cross-sectional, and the causal direction cannot be firmly established. Most researchers interpret the association in terms of SES determining health status. However, some researchers have shown that health status also affects SES. Among adults age 50 and older in the Health and Retirement Study, Smith⁴⁹ showed that individuals who experienced episodes of poorer health had subsequent drops in income resulting from health care costs and/or reduced involvement in work or early retirement. In additional analyses, Smith⁵⁰ showed quantitatively large effects on employment, income, and wealth of new serious health events. He also demonstrated additional effects of early life experiences, showing that better childhood health and family economic environments as reported in adulthood remained significant predictors of better adult health even after controlling for current health and economic status (see Kawachi, in this volume).

The clearest demonstration of the effect of SES on health is in relation to birth outcomes. Infants born to mothers with less education and less income are more likely to experience intrauterine growth restriction, be born prematurely, and have a low birth weight.⁵¹ This disadvantage sets them on trajectories of poorer health, but also of lower adult SES achievement⁴⁹ as childhood illness affects academic achievement that, in turn, shapes adult SES.⁵² Over the entire lifecourse, as shown in Figure 2, there are reciprocal influences, with SES impacting health and

health impacting success in various SES domains (e.g., educational attainment, adult occupation and income, retirement assets).

The second era shone a light on health disparities along the entire socioeconomic hierarchy and across the lifespan. It raised questions about the causal direction and the strength of the gradient at different life stages, and research on these questions continues. At the same time, it raised questions about how these socioeconomic forces result in poorer health. These questions became the basis for a third era of research.

Third era: mechanisms

The central questions of the third era of research revolve around the mechanisms by which SES affects health. What is it about more money, more education, and higher social class that lead to better health? Increased interest in model development in the social sciences, methodological developments from the field of anti-poverty research,⁵³ and more sophisticated treatment of the moderator–mediator variable distinction^{54,55} contributed to this next evolutionary step toward more mechanistic analyses, building on the more descriptive work done in the first two eras. The early explanations for findings of a graded association between SES and health were of two types. Some researchers, for example, Lynch *et al.*,⁵⁶ emphasized the importance of material resources; whereas others, for example, Wilkinson,⁵⁷ noted the contribution of psychosocial factors. These can be seen as competing explanations, but they are not inherently at odds with one another. The gradient may emerge as the result of both types of variables and their interaction (see Kawachi *et al.*, in this volume, for a

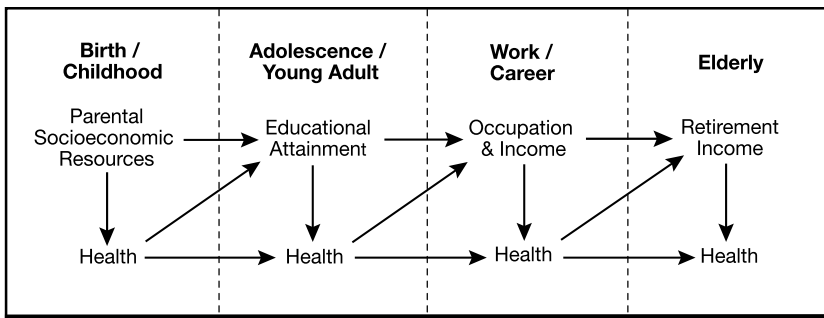


Figure 2. The dynamic relationship between SES and Health.

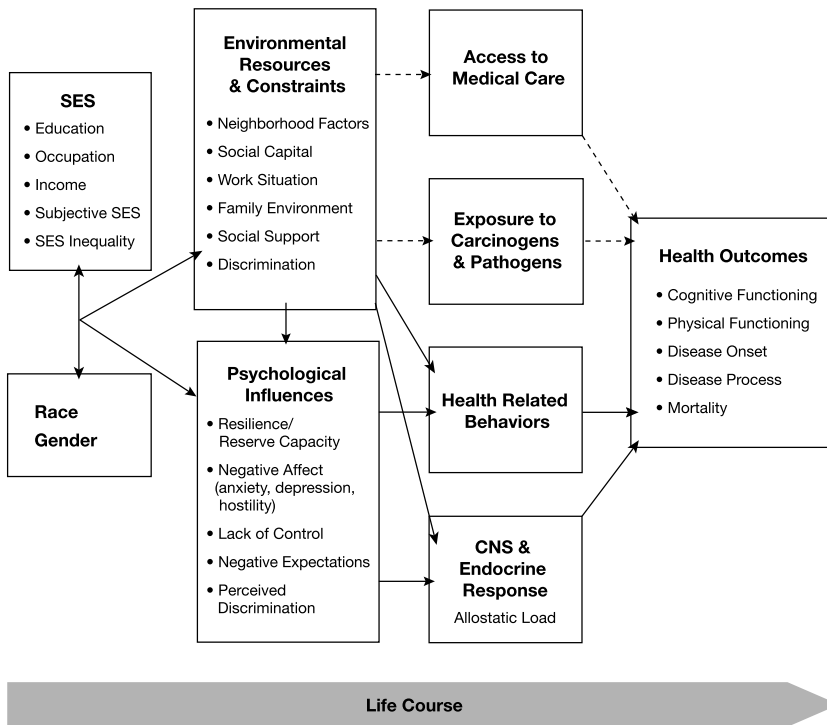


Figure 3. Pathways linking SES and Health. *Note:* The *solid lines* indicate pathways studied by the MacArthur Network on SES & Health; *dashed lines* indicate pathways of importance which the network did not study.

fuller discussion). Although it seems likely that material resources would play a particularly important role among those at the bottom of the SES hierarchy, Lachman & Weaver⁵⁸ found low SES individuals with a high sense of control showed levels of health and well-being comparable with individuals in higher income groups.

The MacArthur Research Network on SES & Health was established to identify the mechanisms by which those who are disadvantaged on the basis of SES develop poorer health. Investigators from a range of disciplines joined together to address the question “How does socioeconomic status get under the skin?” (see Adler and Stewart on team science, in this volume, for a more detailed account of this process). To frame our research, we first developed a simplified model to depict the major pathways by which SES could influence biological processes in the body (see Fig. 3). The model did not include feedback loops and interaction effects, because at this point identifying pathways without these complicating factors was sufficiently challenging. The examination of interactions awaits the fifth era of

research. The papers that follow describe specific psychosocial and biological pathways linking SES and health. Here we briefly touch upon some of the pathways that are often cited as contributing to health disparities, including health care access, environmental exposures, health behaviors, and psychosocial and biological processes associated with stress exposure.

Differential access to health care, as noted earlier, is perhaps the most salient pathway from SES to poor health in the United States, and is certainly the one which has received the most popular and scientific attention. Given the lack of universal coverage, those with less income and in occupations/jobs that do not provide insurance are more likely to be uninsured.⁵⁹ A good deal of research has focused on the role of unequal access to health care in the creation of socioeconomic and racial/ethnic health disparities. Andrulis⁶⁰ makes a case for the importance of universal health care in reducing health disparities through a select review of studies linking health care access, socioeconomic group, and health consequences. Interventions that provide more

intensive treatment appear particularly effective in diminishing disparities in outcomes. For example, a New Jersey initiative to improve birth outcomes among ethnic minority women found an increase of almost 56 g in mean birth weight and a 3.7% reduction in the likelihood of having a low birth weight infant in response to the program which increased prenatal visits, increased provider reimbursement and provided post-pregnancy follow-up, case coordination and health education.⁶¹ Similarly, socioeconomic disparities in mortality due to hypertension were eliminated in the Hypertension Detection and Follow-up Program where all participants, regardless of SES, were provided comparable levels of care.⁶²

In general practice, however, given the features of our current health care system, simple provision of health insurance will not eliminate disparities. For one thing, insurance coverage alone will not assure equal access and use. Travel time, transportation availability and cost, scheduling flexibility, sense of self-efficacy and control, among other factors, all affect individuals' capacities to take advantage of access to medical care. These factors are affected by SES. In addition, our system focuses primarily on medical treatment of diseases, not on their prevention. Overall health and longevity are determined to a greater extent by whether one falls ill rather than by medical care. Inadequacies of health care, including lack of access and poor quality of care, are estimated to account for only about 10% of premature mortality overall.⁶³ Thus, health disparities would remain even under conditions of universal coverage as has been found in England and other countries with such coverage.

Although not the whole story, health care is still an important pathway. Frenk⁶⁴ notes that while it is clear that access to health care will not alone eliminate health disparities, it is reasonable to assume that it may work synergistically with improved social conditions to provide disadvantaged groups with better health outcomes.

Environmental exposures are a second pathway linking SES and health. Environmental hazards and resources are not randomly distributed. Rather, low SES communities are subjected to more hazards and have access to fewer resources to ameliorate their effects. Recognition of the differential placement of environmental hazards like toxic dumps in disadvantaged communities gave rise to the envi-

ronmental justice movement.⁶⁵ The U.S. EPA endorsed environmental justice with the statement that "no group of people, including racial, ethnic or socioeconomic groups should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal environmental programs, and policies."⁶⁵ (pp. 7–8)."

Much of the research documenting unequal exposures to chemical and other toxic substances has been done outside of the medical domain and there is limited research on the contribution of environmental exposures to the SES gradient in health.⁶⁶ Existing studies document that exposures to such environmental forces as air and water pollution, ambient noise, hazardous waste and toxins such as lead are socially patterned, with lower SES individuals having greater exposure.⁶⁶

As with access to health care, environmental exposures are salient to communities, but may play a limited role in determining health disparities, in part because of their minor role in determining health overall. McGinnis *et al.*⁶³ estimate that the physical environment contributes only 5% to premature mortality; in comparison they estimate that health behaviors are responsible for 40% of premature mortality.

Health behaviors contribute to higher morbidity related to a range of diseases as well as to mortality. Virtually every health behavior, including smoking, physical inactivity, and unhealthy diets, is patterned by SES. Among the health behaviors, tobacco use accounts for the greatest number of deaths, with approximately 400,000 deaths a year in the United States attributed to smoking.⁶⁷ Smoking is detrimental to a number of bodily systems, including respiratory, cardiovascular, and immune systems, resulting in diseases such as COPD, CVD, and various types of cancer. It is not only individuals who smoke who bear the negative health consequences, but also those who live with them. Maternal and paternal cigarette use expose children in the family to second-hand smoke. Such exposure has short-term health effects, such as exacerbating respiratory problems and asthma,⁶⁸ as well as setting the stage for diseases which arise later in life.⁶⁹ In addition, parents' smoking provides a model which may increase the likelihood that their children will themselves become smokers.⁷⁰

Although 40 years ago smoking was equally prevalent at different levels of SES, today it is more common among those with less education and income. Those of higher SES had more access to compelling evidence on the link between smoking and cancer and cardiovascular disease, and to resources to help them stop smoking. Thus, smoking rates declined far more rapidly at higher SES levels. Differential rates of smoking by SES currently contribute to health disparities. For example, lung cancer previously did not show an SES gradient but as smoking became socially patterned, a gradient has emerged in rates of lung cancer.

SES gradients exist in other health behaviors as well. The growing obesity epidemic, with its association with type 2 diabetes, hypertension, coronary heart disease, stroke, heart failure, and several types of cancer^{71–74} is more acute among lower SES populations. Although there are divergent estimates of the impact of overweight and obesity on mortality,⁷⁵ epidemiologic studies demonstrate a moderate increase in mortality with overweight and a two- to threefold mortality increase with obesity. Manson *et al.*⁷⁵ conclude that quality-adjusted life expectancy at age 18 is reduced by 7.2 years for obese women and 4.4 years for obese men.

Obesity is the result of behaviors involved with diet and exercise that determine the balance of energy intake and expenditure. These behaviors are influenced by external factors such as food industry advertising, the availability of affordable and nutritious food and pleasant recreational areas, and mandated activities such as school physical education programs. Interestingly, while there is an SES gradient in obesity, the gap in rates of obesity by SES is closing somewhat.⁷⁶ Rates of obesity are increasing in all segments of the U.S. population, but rising faster now at higher levels of SES. It may be that lower SES individuals were “early responders” to the increasingly obesogenic environment in the United States. As the rest of the population shows the effects of this environment, efforts to reverse the trend may differentially benefit those of higher SES. If so, as with cigarette smoking; we may see the gap increase in the future.

Differential exposure to stress constitutes a fourth pathway between SES and health. This pathway is less obvious than the others, and the magnitude of its impact on premature mortality has not been calculated. Stress is defined and measured in a num-

ber of ways. Some research, especially that using an epidemiological approach, focuses on the external threat, or “stressor.” This is generally defined as an objective event, which requires change or adaptation by an individual and/or is consensually judged to have negative impact. The research on life events uses such an approach.^{77,78} However, observing that not all individuals experience the same event as equivalently threatening, psychologists such as Lazarus and Folkman⁷⁹ define stress as a subjective state that emerges when individuals appraise a threat as exceeding their resources to deal with it. Still others define stress in terms of the physiological indicators of activation of the stress response system, including activation of the sympathetic nervous system (or vagal withdrawal) or of the hypothalamic–pituitary–adrenal axis⁸⁰ as reflected by changes in blood pressure, heart rate and heart rate variability, skin conductance, and cortisol.

Stress has health effects when it exceeds coping capacities, and especially when it is severe and/or chronic. Some “stress” can be positive, as when a challenge is met and results in a satisfying outcome; such experiences can create a sense of exhilaration, and of mastery and control. If the threat itself cannot be modified but the individual has sufficient social and psychological resources to deal adequately with its emotional impact, stress is negative but not necessarily damaging. In contrast, toxic stress results when an individual is chronically exposed to uncontrollable stressors, such as a chaotic environment, abuse or neglect, in the absence of adequate social or emotional support. Increasing intensity and frequency of stressors interacting with fewer personal and interpersonal resources can contribute to tolerable stress turning into toxic stress. The chronicity and severity of stressors play key roles in moderating the nature and intensity of associated alterations in immunologic parameters⁸¹ and inflammatory processes.^{82,83} In addition to direct physiological effects of toxic stress that increase risk for disease, individuals may attempt to cope with these experiences through health-damaging behaviors.

Research linking stress and health is built on a strong foundation of basic research on physiological effects of stress exposure. Much of this research has been laboratory-based or uses animal models. It has provided knowledge of the stress response and the role of stress hormones in regulating the immediate fight or flight response.⁸⁴ Stress has been studied less

often in the “real world.” Lower SES environments expose individuals to more stressors while simultaneously providing them with fewer resources to deal with these stressors. These environments increase the likelihood of acute stress exposure and also contribute to toxic chronic stress.^{85,86}

The stress response is protective in the short term; it allows an immediate reaction to a threat followed by reestablishment of homeostasis. However, when stressors are frequent, over time the constant readjustment of the stress response system may cause dysregulation in multiple bodily systems. Chronic levels of stress have been linked to adverse effects including high blood pressure, susceptibility to infection, the buildup of fat in blood vessels and around the abdomen, and atrophy of brain cells.^{87–92} “Allostatic load” provides a useful heuristic model accounting for such changes in response to chronic stress.^{93–95} Allostatic load scores reflect how well or poorly the cardiovascular, metabolic, nervous, hormonal and immune systems are functioning. Higher scores indicate greater dysregulation and greater vulnerability to disease and predict subsequent onset of cardiovascular disease and mortality. Several studies have shown that allostatic load scores increase as SES decreases.^{96,97} Work to determine the best operationalization for allostatic load continues, but the evidence is growing that it captures biological consequences of stress that may help account for the linkage between socioeconomic disadvantage and a wide array of disease outcomes, and all-cause mortality (see McEwen and Gianaros and Seeman *et al.*, in this volume).

Evidence of allostatic load resulting from chronic stress associated with lower SES is consistent with the view that SES-related exposures contribute to an acceleration of the aging process. Aging is associated with the increasing dysregulation of bodily systems; this natural process appears to accelerate, moving earlier in the lifecourse when individuals are living with greater adversity (see Seeman *et al.*, in this volume). Conversely, a more advantaged life may slow the aging process. Geronimus⁹⁸ suggested a similar process of accelerated aging resulting from social disadvantage in relation to birth outcomes, which she termed “weathering.” The weathering hypothesis posits that the poorer birth outcomes for African-American women compared to age-matched peers which become more marked as women enter their 20s and 30s reflects earlier

health deterioration as a consequence of social exclusion. In a recent study, Geronimus *et al.*⁹⁹ found higher allostatic load scores for blacks versus whites in a nationally representative sample, a result especially marked among those aged 35–64.

Recent studies provide preliminary evidence that social disadvantage associated with low SES may accelerate aging at the cellular level as indicated by the length of telomeres. Telomeres, DNA repeat sequences at the tips of chromosomes which act to protect the chromosome, shorten with age. Below a critical length, shorter telomeres are associated with cell senescence and prospective studies have found that telomere length predicts mortality.^{100,101} In the first study to link social exposure to telomere length, Epel *et al.*⁹² show that both objective indicators of stress and subjective reports of distress are associated with shorter telomere length. The association of stress and telomere length remained significant when adjusted for age, smoking, BMI, and vitamin use. A study of over 1500 adult female twins in the United Kingdom showed a link between social class and telomere length.¹⁰² Women in manual occupational classes based on their own or their spouse’s occupation had significantly shorter telomeres than those in nonmanual classes. Part of the difference was mediated through behavioral factors (e.g., smoking, exercise, and BMI), but significant differences remained when adjusted for these factors.

While much of the work on mechanisms has focused on adults, some researchers have identified mechanisms by which SES affects health during childhood and adolescence. These processes may set children on different health trajectories that will affect them over their lifespan. Starting even before birth, differences in the prenatal environment of babies born to mothers of different social classes can have lasting health implications. Children born to mothers with less education and income are more likely to be born prematurely and be smaller at birth.⁵¹ Not only do such children have a higher neonatal mortality risk, but these conditions place them at greater risk of developing cardiovascular disease and other problems later in life.^{103,104}

Beyond birth outcomes, experiences in early life that shape interpretations of social stimuli may serve as another mechanism by which SES affects health. Lower SES environments pose more threats and foster more interpersonal conflict. Repeated exposures

to such conflictual conditions may create expectancies that establish a lower threshold for perceiving threat. Expectations of threat may, in turn, increase the likelihood of negative affect and physiological stress responses. Chen *et al.*¹⁰⁵ found that high school students from low SES families did not differ from their high SES peers in interpreting clearly negative stimuli, but were more likely to interpret an ambiguous situation as threatening. The former had higher systolic blood pressure, consistent with their displaying greater threat responses during ambiguous social situations. Low SES children and adolescents may develop a constantly vigilant stance that revolves around keeping the self safe, leading to a state of chronic stress.

The search for mechanistic pathways focuses on processes operating within individuals to illuminate psychobiological and behavioral processes by which SES can affect health. These mechanisms are, however, shaped by the environmental context in which they arise. Environments affect individuals through a variety of factors including social encounters that can impose stress responses as well as supportive encounters that can reduce them, social norms governing health behaviors, and enhanced or restricted resources for healthy living. In the next era of research, investigators paid more attention to these contextual factors of groups or environments to which an individual belongs, or inhabits.

Fourth era: multiple levels of influence

Along with continued research on specific mechanisms at the individual level including cognitive, affective, and behavioral responses to SES-related environments by which SES affects biology, work has evolved in a fourth era to examine mechanisms operating at multiple levels of influence. This work has focused on characteristics of the neighborhood and community as well as of the individual. This evolution was aided by the application of hierarchical and contextual models developed by statisticians that allow health disparities researchers to use neighborhood data in new ways. In earlier years, the socioeconomic characteristics of the neighborhood (e.g., mean income level, percent with college degree, percent unemployed) were sometimes used as a proxy for the characteristics of individuals residing in those neighborhoods.¹⁰⁶ However, neighborhoods may affect health through processes

that operate at the neighborhood level, not simply because the community is composed of individuals with given socioeconomic resources. Interest developed in the contribution of the neighborhood apart from the characteristics of the individuals, not as a marker for them, and, the neighborhood itself became the focus of interest (see Diez Roux and Mair, in this volume). These studies have shown, for example, that individuals living in lower SES neighborhoods have poorer health related to the socioeconomic characteristics of the neighborhood, independent of their own SES.^{107–109}

Studies in this era have examined the ecological embeddedness of risk factors for disease that differ by socioeconomic level (see “Clougherty, Souza, and Cullen, in this volume, for an analysis of the work environment). A number of these studies have identified environmental determinants of health behaviors, particularly those that contribute to overweight and obesity. Although described as a personal behavior, one’s ability to eat a healthy diet and to exercise is affected by resources available to the person. The availability and relative cost of healthier foods such as fresh fruits and vegetables varies considerably across communities that vary by SES. Attention increasingly has focused on the built environment, with studies documenting more limited availability of resources in poorer communities^{110–112} Low SES communities often lack supermarkets and residents are more dependent on convenience markets where produce is not only more expensive but less fresh and appealing. These same communities often lack recreational facilities and their residents may be inhibited from outdoor activities such as walking or jogging by fear of crime.¹¹³

The unjust distribution of environmental resources that enable healthy living and hazards that constrain healthy living contribute to the SES gradient of health behaviors, and hence health. The fourth era brought greater focus on the social attributes of residential areas and on the built environment. Increased understanding of how SES at the neighborhood level constrains healthy behaviors emerged in this era and gave rise to the concept of “behavioral justice.”¹¹⁴ This perspective argues that no group should bear a disproportionate share of health problems resulting from inadequate resources for engaging in healthy behaviors. Environments dominated by easy access to tobacco products and alcohol, fast food outlets, scarcity of

affordable and appealing fresh fruits and vegetables, and unsafe, uninviting community conditions that restrict physical activity, stack the odds against individuals in those communities achieving good health. The concept of behavioral justice provides a conceptual link between the individual (behavioral) level and the social (neighborhood) levels while multi-level analysis allows for empirical evaluation of their separate effects on health.

While the fourth era added analysis of multiple levels, the questions were generally framed in terms of independent effects (i.e., to what extent do neighborhood factors contribute to health independent of individual factors?). Analyses focused largely on main effects. Some studies, however, began to look at the effect of combinations of factors. In so doing they moved beyond main effects to analyze interactions in the context of multilevel analyses.

Fifth era: interactions, systems, and causality

Just as the introduction of the gradient in the second era added complexity and nuance to the categorical frame of the first, the third era's focus on mechanism added detail to flesh out the pathways from SES to health, and the fourth era added contextual information, research in the fifth era looks not only at independent associations of different domains but at how effects are moderated by combinations of factors.

A variety of interactions are being studied as illustrated by the examples given later.

The interaction of individual and neighborhood SES is a case in point. In addition to examining the effect of neighborhood income independent of one's own, studies are also asking whether the benefits of living in more affluent communities are similar for those with more and less income and/or education. Winkleby *et al.*¹¹⁵ studied 82 neighborhoods in four California cities to examine whether the influence of individual-level SES on mortality differed by neighborhood-level SES. Neighborhood SES was defined by census variables including percent with less than a high school education, median annual family income, percentage blue-collar workers, percentage unemployed, and median housing value. Individual SES was defined by educational attainment and household income. Death rates for low SES women were highest in high SES neigh-

borhoods, lower in moderate SES neighborhoods, and lowest in low SES neighborhoods. Men showed a similar pattern, although somewhat attenuated. These differences in mortality were not explained by individual baseline risk factors. These results suggest that low SES individuals may not benefit from the greater resources available in higher SES communities. The stress of having low relative standing in a high SES neighborhood, and potentially fewer resources to cope with stressful life events (e.g., social support and low perceived control), may play a role in the higher mortality of low SES individuals. Four other studies have examined the cross-level interaction between individual and neighborhood SES on mortality, three of which found similar results,^{108,116,117} while one did not find a significant cross-level interaction.¹¹⁸

Racial/ethnic differences in health may also be moderated by neighborhood characteristics. Subramanian *et al.*¹¹⁹ studied neighborhood variations in poverty and excess mortality. They found greater racial/ethnic disparities in some neighborhoods than in others, with the odds ratio for Blacks compared to Whites ranging from 0.31 to 5.36. The finding that neighborhood level poverty contributes to greater geographic heterogeneity in mortality rates for Blacks suggests that neighborhood deprivation may be particularly impactful for Blacks compared to Whites.

A different approach to understanding the intersection of SES and race/ethnicity is to examine how the effects of SES on health differ among racial/ethnic groups. For example, among Black and White men in CARDIA, a longitudinal study of the development of cardiovascular risk factors in adulthood, patterns of SES associations with cellular aging differ by race. Using stored blood, Epel *et al.* (personal communication) are examining socioeconomic differences in telomere length. As discussed earlier, telomeres cap the ends of chromosomes and shorten with age; shorter telomere length is predictive of cardiovascular disease and mortality. Preliminary results indicate that among White men, those with less education and lower household income have shorter telomeres and greater change in length over 5 years. However, SES is not related to telomere length among African-American men.

SES gradients in health outcomes among children also appear to differ by racial/ethnic group.

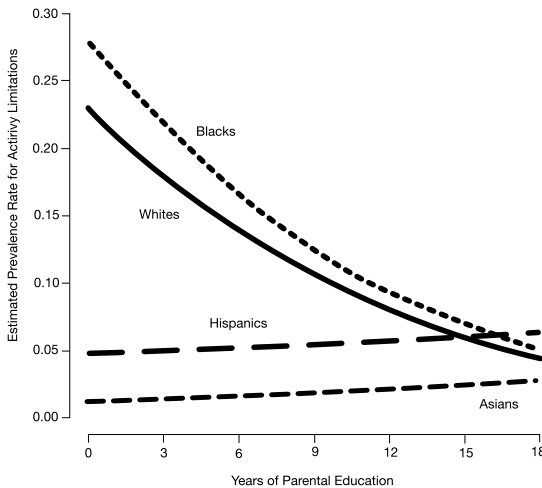


Figure 4. Parental education \times race interaction for childhood activity limitation. *Note:* The education line was not significant among White and Black children but was significant for Hispanic and Asian children (P -values were <0.05). (Reprinted from Chen E., A. D. Martin & K. A. Matthews. 2006. Understanding health disparities: the role of race and socioeconomic status in children's health. *Am. J. Public Health* 96: 702–708, by permission from the *American Journal of Public Health*.)

Using data from the National Health Interview Survey, Chen *et al.*¹²⁰ found the usual SES gradients in health for White and Black children but not for Asian or Hispanic children (see Fig. 4). For example, the prevalence of activity limitations due to illness drops for Black and White children at higher levels of parental education. In contrast, there is little effect of parental education for Hispanic and Asian children who actually show a small increase in activity limitations as parental education increases.

These data underscore the importance of looking within each racial/ethnic group when examining the association of SES and health. Doing so is important not only because of possible interactions but because current measures of SES do not fully capture racial differences in socioeconomic position. For example, at the same income level African Americans have less wealth (assets like savings and home equity) than do Whites.²⁹ Wealth provides a reserve that protects against uncertainty in the labor market, helps reduce stress on families, and allows families to live in well-resourced communities. In terms of education, high school graduation may have a quite different meaning depending on

the quality of the high school, something which often is quite discrepant among different racial/ethnic communities. New approaches are trying to assess these differences so that better comparisons can be made across groups.

In a different domain, researchers are increasingly considering the interaction of individual biology and social context. Boyce and his colleagues have found interactions between social context and temperament among children as well as in non-human primates.^{121,122} In the Peers and Wellness Study (PAWS), children were followed through the kindergarten year to examine the effects of family SES and of the child's position in the peer group social hierarchy on school adjustment. Biological reactivity was assessed before the start of the school year in response to social, cognitive, and emotional challenges. Children from more adverse family environments (e.g., greater financial strain, marital conflict) exhibited more externalizing behaviors at the start of kindergarten, whether or not they showed greater biological reactivity. However, among children from low-adversity families, the extent of externalizing behaviors differed between children with high versus low reactivity, suggesting a greater impact of context on the more reactive children. On the other hand, school engagement showed a cross-over effect with low-reactivity children from high-adversity families slightly more engaged than their high-reactivity peers and high-reactivity children from low-adversity homes more engaged than their lower reactivity peers.

The evaluation of interaction effects is becoming more common in genetic research, with increasingly sophisticated work on the gene–environment interaction and on epigenetics. Miller *et al.*⁸³ show how a severe chronic stressor, caring for a family member with brain cancer, influences cortisol-mediated signaling in monocytes, the white blood cells that drive inflammation. Genes that cortisol usually switches on were not expressed as strongly in monocytes from caregivers as were those from non-caregiver controls, whereas genes that cortisol usually silences were more active in caregivers than in controls. This finding suggests a mechanism for how chronic stress may facilitate the pro-inflammatory gene expression cascade associated with coronary disease, autoimmune disorders, and infectious diseases. Findings by Caspi *et al.*¹²³ and Taylor *et al.*¹²⁴ show how genetic risk moderates the impact of

environmental exposures. Their work has shown that stress exposure increases the risk of depression primarily among individuals with a genetic polymorphism associated with vulnerability to depression (a short allele of the serotonin transporter gene). Those lacking the polymorphism did not experience a greater risk of depression with stress exposure.

Research on epigenetics is introducing further complexity into our understanding of the interaction of genes and environment. Studies are showing that environmental context can act upon the gene itself. Environmental conditions may influence gene expression and thus change resulting behavioral and/or biological outcomes. Animal studies conducted by Meaney¹²⁵ have shown that early experiences of maternal care or neglect affect offspring in multiple ways, including their stress-responsiveness and their later response to their own offspring. Insights from animal models are now being applied to humans and will provide opportunities to delineate more precise biological pathways by which social factors associated with SES affect health.

A few researchers are attempting to study the kinds of complex interactions linking SES and health using systems models that capture nonlinear, dynamic associations^{126,127} These move beyond regression models and simple interactions to capture interdependent variables that change over time. In addition to modeling empirical relationships, computer simulations are extending the reach of this research to predict how policy or environmental changes might reverberate through a population and affect health. The greater sophistication of such analytic and conceptual models may facilitate more complex and complete understanding of disparities and of the potential value of different approaches to reducing them.

During this most recent era, researchers have also become more concerned about establishing causality.¹²⁸ The majority of studies linking SES and health are cross-sectional, reporting associations between a given SES indicator and a health outcome and attributing causality to the SES indicator. These designs cannot rule out alternative explanations, however, including potential endogeneity and reverse causation. These issues are especially important in evaluating the relationship of income and health since poor health entails financial costs and can also affect one's ability to work.⁴⁹ Yet even with education

which is established earlier in life, causality may flow in both directions because childhood health problems may limit educational attainment^{46,129} which in turn may affect health later in adulthood. Increasingly, studies are using longitudinal data and applying new statistical techniques to explore causal direction¹³⁰ along with novel experimental designs. Studies involving randomized interventions and natural experiments such as the Social Security "notch"¹³¹ and economic change due to reunification in Germany¹³² also allow more definitive tests of causality. While these studies have yielded mixed results, the preponderance of the evidence continues to support the impact of socioeconomic factors on health across the lifespan.

Conclusion

Each era of research has advanced our understanding of health disparities. In parallel to the unfolding eras of research designed to increase our understanding of the nature and causes of health disparities, there have been successive eras of thinking about intervention and policy. These, too, have shown increasing complexity and sophistication¹³³ (see Dow *et al.*, in this volume). Experimental programs such as PROGRESA (now known as Oportunidades) in Mexico are directly testing innovative policies. A number of such programs are providing evidence on whether incentive programs are effective, under what conditions, and for whom. These parallel advances foreshadow a sixth era of work on health disparities; one which translates evidence into policy and develops interventions and evaluation protocols based on the sophisticated understanding allowed by the aggregate of knowledge accrued across eras of health disparities research. New conceptual frameworks coupled with more sophisticated methodologies have allowed increasingly more detailed and nuanced examination of the realities of the social patterning of health. The chapters that follow explore where we stand today in the study of the determinants of health and the potential for eliminating the unjust disparities in the capacity of all people to achieve their maximal state of health.

Acknowledgments

This work was supported by the John D. and Catherine T. MacArthur Foundation. We thank Drs. Ana Diez Roux and Ichiro Kawachi, and other members

of the MacArthur Foundation Research Network on Socioeconomic Status and Health for their constructive comments on a draft of this paper.

Conflicts of interest

The authors declare no conflicts of interest.

References

- Braveman, P. & S. Egerter. 2008. Overcoming obstacles to health: Report from the Robert Wood Johnson Foundation to the Commission to Build a Healthier America. Robert Wood Johnson, February, 2008.
- Mishel, L., J. Bernstein & S. Allegretto. 2007. The State of Working America 2006/2007. *An Economic Policy Institute Book*. ILR Press, an imprint of Cornell University Press, Ithaca, NY. Retrieved on December 1, 2008 from Inequality.org at <http://www.stateofworkingamerica.org/tabfig/01/SWA06-Fig1J.gif>
- U.S. Census Bureau, 2008. Current Population Survey, Annual Social and Economic Supplements. Retrieved on December 1, 2008 from Inequality.org at <http://www.census.gov/hhes/www/income/histinc/f03ar.html>
- U.S. Department of Health and Human Services. 2000. *Healthy People 2010*. 2nd edn. Washington, DC.
- Healthy People 2010 Midcourse Review; retrieved on August 1, 2008 at <http://www.healthypeople.gov/Data/midcourse/html/execsummary/introduction.htm>
- Braveman, P. 2006. Health disparities and health equity: concepts and measurement. *Annu. Rev. Public Health* **27**: 167–194.
- Whitehead, M. 1991. The concepts and principles of equity and health. *Health Promot. Intl.* **6**: 217–228.
- Kawachi, I., N. Daniels & D.E. Robinson. 2005. Health disparities by race and class: why both matter. *Health Affairs* **24**: 343–352.
- Isaacs, S.L. & S.A. Schroeder. 2004. Class—the ignored determinant of the nation's health. *New Engl. J. Med.* **351**: 1137–1142.
- Liberatos, P., B.G. Link & J.L. Kelsey. 1988. The measurement of social class in epidemiology. *Epidemiol. Rev.* **10**: 87–121.
- Lynch, J.W., G.A. Kaplan, R.D. Cohen, *et al.* 1996. Do cardiovascular risk factors explain the relation between socioeconomic status, risk of all-cause mortality, and cardiovascular mortality, and acute myocardial infarction? *Am. J. Epidemiol.* **144**: 934–942.
- Krieger, N., D.R. Williams & N.E. Moss. 1997. Measuring social class in public health research: concepts, methodologies, and guidelines. *Annu. Rev. Public Health* **18**: 341–378.
- Farr, W. 1975. Vital statistics: a memorial volume of selections from the reports and writings of William Farr. *Introduction by Mervyn Susser and Abraham Adelstein*. Scarecrow Press. Metuchen, NJ.
- Virchow, R. 1848. Report on the typhus epidemic in Upper Silesia. 1848. In *Rudolph Virchow: Collected Essays on Public Health and Epidemiology*. Rather, I.J. Ed.: 205–220. Science History Publications. Canton, MA.
- Durkheim, E.S. 1897 (1951 reprint edition). Free Press, New York, NY.
- Engels, F. 1844. The condition of the working class in England. Retrieved on January 15, 2009 at <http://www.marxists.org/archive/marx/works/1845/condition-working-class/index.htm>.
- Doyal, L. 1979. *The Political Economy of Health*. Pluto Press. London.
- Link, B.G. & Phelan, J.C. 1986. Editorial: understanding sociodemographic differences in health—the role of fundamental social causes. *Am. J. Public Health* **86**: 471–473.
- Navarro, V. 1986. *Crisis, Health, and Medicine: A Social Critique*. Tavistock. New York.
- Townsend, P. 1986. Why are the many poor? *Intl. J. Health Serv.* **16**: 1–32.
- Tesh, S.N. 1988. *Hidden Arguments: Political Ideology and Disease Prevention Policy*. Rutgers, London, UK.
- Krieger, N. 2001. Theories for social epidemiology in the 21st century: an ecosocial perspective. *Intl. J. Epidemiol.* **30**: 668–77.
- Engel, G.L. 1977. The need for a new medical model. *Science* **196**: 129–136.
- Antonovsky, A. 1979. *Health, Stress and Coping*. San Francisco, Jossey-Bass.
- Antonovsky, A. 1987. *Unravelling the mystery of health. How People Manage Stress and Stay Well*. San Francisco, Jossey Bass.
- Kitagawa, E.M. & P.M. Hauser. 1973. *Differential Mortality in the United States: A Study in Socioeconomic Epidemiology*. Harvard University Press. Cambridge.
- Black, D., J.N. Morris, C. Smith, *et al.* 1982. *The Black Report (Report of the Working Group on Inequalities)*. Penguin. London.
- Adler, N.E. & J.M. Ostrove. 1999. Socioeconomic status and health: what we know and what we don't. In *Socioeconomic Status and Health in Industrialized Nations: Social, Psychological and Biological Pathways*. Adler, N.E.,

- M. Marmot, B.S. McEwen & J. Stewart, Eds.: 3–15. *Annals of the New York Academy of Sciences* 896.
29. Williams, D.R. & C. Collins. 1995. U.S. socioeconomic and racial differences in health: patterns and explanations. *Ann. Rev. Sociol.* **21**: 349–386.
 30. Williams, D.R. 1999. Race, socioeconomic status and health: the added effects of racism and discrimination. In *Socioeconomic Status and Health in Industrialized Nations: Social, Psychological and Biological Pathways*. Adler, N.E., M. Marmot, B.S. McEwen & J. Stewart Eds.: 173–188. *Annals of the New York Academy of Sciences* 896.
 31. Marmot, M.G., M.J. Shipley & F. Rose. 1984. Inequalities in death—specific explanations of a general pattern? *Lancet* **1**: 1003–1006.
 32. Marmot, M.G., G.D. Smith, S. Stanfeld, *et al.* 1991. Health inequalities among British civil servants: the Whitehall II study. *Lancet* **1**: 1387–1393.
 33. Marmot, M. & E. Brunner. 2005. Cohort profile: the Whitehall II study. *Intl. J. Epidemiol.* **34**: 251–256.
 34. Adler, N.E., W.T. Boyce, M.A. Chesney, *et al.* 1993. Socioeconomic inequalities in health. No easy solution. *J. Am. Med. Assoc.* **269**: 3140–3145.
 35. Adler, N.E., T. Boyce, M.A. Chesney, *et al.* 1994. Socioeconomic status and health: the challenge of the gradient. *Am. Psychol.* **49**: 15–24.
 36. Marmot, M., C.D. Ryff, L.L. Bumpass, *et al.* 1997. Social inequalities in health: next questions and converging evidence. *Social Sci. Med.* **44**: 901–910.
 37. Pappas, G., S. Queen, W. Hadden, *et al.* 1993. The increasing disparity in mortality between socioeconomic groups in the United States, 1960 and 1986. *New Engl. J. Med.* **329**: 103–109.
 38. McDonough, P., G.J. Duncan, D. Williams, *et al.* 1997. Income dynamics and adult mortality in the United States, 1972 through 1989. *Am. J. Public Health* **87**: 1476–1483.
 39. Chen, E., K.A. Matthews & W.T. Boyce. 2002. Socioeconomic differences in children's health: how and why do these relationships change with age? *Psychol. Bull.* **128**: 295–329.
 40. Evans, G.W. 2003. A multimethodological analysis of cumulative risk and allostatic load among rural children. *Develop. Psychol.* **39**: 924–933.
 41. Evans, G.W. & L.A. Marcynyszyn. 2004. Environmental justice, cumulative environmental risk, and health among low- and middle-income children in upstate New York. *Am. J. Public Health* **94**: 1942–1944.
 42. Bauman, L.J., R.E.K. Stein & E.J. Silver. 2006. Cumulative social disadvantage and child health. *Pediatrics* **117**: 1321–1328.
 43. Minkler, M., E. Fuller-Thomson & J. Guralnik. 2006. Gradient of disability across the SES spectrum. *New Engl. J. Med.* **355**: 43–51.
 44. Wise, P.H., M. Kotelchuck, M.L. Wilson, *et al.* 1985. Racial and socioeconomic disparities in childhood mortality in Boston. *New Engl. J. Med.* **313**: 360–366.
 45. West, P. 1997. Health inequalities in the early years: is there equalization in youth? *Social Sci. Med.* **44**: 833–858.
 46. Case, A., D. Lubotsky & C. Paxson. 2002. Socioeconomic status and health in childhood: the origins of the gradient. *Am. Econ. Rev.* **92**: 1308–1344.
 47. Chen, E., A.D. Martin & K.A. Matthews. 2007. Issues in exploring variation in childhood socioeconomic gradients by age: a response to Case, Paxson, and Vogl. *Social Sci. Med.* **64**: 762–764.
 48. Case, A., C. Paxson & T. Vogl. 2007. Socioeconomic status and health in childhood: a comment on Chen, Martin and Matthews, "Socioeconomic status and health: Do gradients differ within childhood and adolescence?" (62:0, 2006, 2161–2170). *Social Sci. Med.* **64**: 757–761.
 49. Smith, J.P. 1999. Healthy bodies and thick wallets: the dual relationship between health and economic status. *J. Econ. Perspect.* **13**: 145–166.
 50. Smith, J.P. 2004. Unraveling the SES-health connection. *Populat. Develop. Rev.: Aging, Health Public Policy* **30**: 108–132.
 51. Kramer, M.S., L. Seguin, J. Lydon, *et al.* 2000. Socioeconomic disparities in pregnancy outcome: why do the poor fare so poorly? *Paediatr. Perinat. Epidemiol.* **14**: 194–210.
 52. Case, A., A. Fertig & C. Paxson. 2005. The lasting impact of childhood health and circumstance. *J. Health Econ.* **24**: 365–389.
 53. Haveman, R. 1987. Poverty research and the social sciences. *Article extracted from Poverty Policy and Poverty Research 1965–1980*. University of Minnesota Press. Retrieved on January 12, 2009 at <http://www.irp.wisc.edu/publications/focus/pdfs/foc92b.pdf>.
 54. Baron, R.M. & D.A. Kenny. 1986. The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *J. Pers. Social Psychol.* **51**: 1173–1182.
 55. Kraemer, H.C., E. Stice, A. Kazdin, *et al.* 2001. How do risk factors work together? Mediators, moderators, and independent, overlapping, and proxy risk factors. *Am. J. Psychiat.* **158**: 848–856.

56. Lynch, J.W., G. Davey Smith, G.A. Kaplan, *et al.* 2000. Income inequality and mortality: importance to health of individual income, psychosocial environment, or material conditions. *BMJ* **320**: 1200–1236.
57. Wilkinson, R.G. 1999. Health, hierarchy and social anxiety. In *Socioeconomic Status and Health in Industrialized Nations: Social, Psychological and Biological Pathways*. Adler, N.E., M. Marmot, B.S. McEwen & J. Stewart Eds.: 48–63. Annals of the New York Academy of Sciences 896.
58. Lachman, M.E. & S.L. Weaver. 1988. The sense of control as a moderator of social class differences in health and well-being. *J. Pers. Social Psychol.* **74**: 763–773.
59. Holahan, J. & N. Brennan. 2007. Who are the adult uninsured? *New Federalism: National Survey of America's Families*. Retrieved January 15, 2008 at <http://www.urban.org/publications/309526.html>.
60. Andrulis, D.P. 1998. Access to care is the centerpiece in the elimination of socioeconomic disparities in health. *Ann. Internal Med.* **129**: 412–416.
61. Reichman, N.E. & M.J. Florio. 1996. The effects of enriched prenatal care services on Medicaid birth outcomes in New Jersey. *J. Health Econ.* **15**: 455–76.
62. Hypertension Detection & Follow-up Program Cooperative Group. 1987. Educational level and 5-year all-cause mortality in the Hypertension Detection and Follow-up Program. *Hypertension* **9**: 641–646.
63. McGinnis, M.J., P. Williams-Russo & J.R. Knickman. 2002. The case for more active policy attention to health promotion. *Health Affairs* **21**: 78–93.
64. Frenk, J. 1998. Medical care and health improvement: the critical link. *Ann. Internal Med.* **129**: 419–420.
65. U.S. Environmental Protection Agency (EPA). 1998. *Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analyses*. Office of Federal Activities, U.S. Environmental Protection Agency. Washington, DC.
66. Evans, G.W. & E. Kantrowitz. 2002. Socioeconomic status and health: the potential role of environmental risk exposure. *Annu. Rev. Public Health* **23**: 303–331.
67. Mokdad, A.H., J.S. Marks, D.F. Stroup, *et al.* 2004. Actual causes of death in the United States, 2000. *JAMA* **291**: 1238–1245.
68. Cook, D.G. & D.P. Strachan. 1997. Health effects of passive smoking: parental smoking and prevalence of respiratory symptoms and asthma in school age children. *Thorax*. **52**: 1081–1094.
69. Barnoya, J. & S.A. Glantz. 2005. Cardiovascular effects of secondhand smoke: nearly as big as smoking. *Circulation* **111**: 2684–2698.
70. Den Exter Blokland, E.A.W., R.C.M.E. Engels., W.W. Hale, *et al.* 2004. Lifetime parental smoking history and cessation and early adolescent smoking behavior. *Prev. Med.* **38**: 359–368.
71. McTigue, K., J.C. Larson, A. Valoski, *et al.* 2006. Mortality and cardiac and vascular outcomes in extremely obese women. *The Journal of the American Medical Association* **296**: 79–86.
72. Moghaddam, A.A., M. Woodward & R. Huxley. 2007. Obesity and risk of colorectal cancer: a meta-analysis of 31 studies with 70,000 events. *Cancer Epidemiol. Biomark. Prev.* **16**: 2533–2547.
73. Mokdad, A.H., B.A. Bowman, E.S. Ford, *et al.* 2001. The continuing epidemics of obesity and diabetes in the United States. *JAMA* **286**: 1195–1200.
74. Must, A., J. Spadano, E.H. Coakley, *et al.* 1999. The disease burden associated with overweight and obesity. *JAMA* **282**: 1523–1529.
75. Manson, J.E., S.S. Bassuk, F.B. Hu, *et al.* 2007. Estimating the number of deaths due to obesity: can the divergent findings be reconciled? *J. Woman's Health* **16**: 168–176.
76. Wang, Y. & M.A. Beydoun. 2007. The obesity epidemic in the United States—gender, age, socioeconomic, racial/ethnic, and geographic characteristics: a systematic review and meta-regression analysis. *Epidemiol. Rev.* **29**: 6–28.
77. Holmes, T.H. & R.H. Rahe. 1967. The social readjustment rating scale. *J. Psychosom. Res.* **11**: 213–218.
78. Goldberg, E.L. & G.W. Comstock. 1980. Epidemiology of life events: frequency in general populations. *Am. J. Epidemiol.* **111**: 736–752.
79. Lazarus, R.S. & S. Folkman. 1984. *Stress, Appraisal, and Coping*. Springer. New York.
80. Selye, H. 1956. *The Stress of Life*. MacGraw-Hill. New York.
81. Segerstrom, S.C. & G.E. Miller. 2004. Psychological stress and the human immune system: a meta-analytic study of 30 years of inquiry. *Psychol. Bull.* **130**: 601–30.
82. Ranjit, N., A.V. Diez-Roux, S. Shea, *et al.* 2007. Socioeconomic position, race/ethnicity, and inflammation in the multi-ethnic study of atherosclerosis. *Circulation* **116**: 2383–2390.
83. Miller, G.E., E. Chen, J. Sze, *et al.* 2008. A functional genomic fingerprint of chronic stress in humans: blunted glucocorticoid and increased NF-kappaB signaling. *Biol. Psychiatry* **64**: 263–265.
84. Salpolsky, R.M. 1998. *Why Zebras Don't Get Ulcers*. 2nd edn. W.H. Freeman & Company. New York.

85. Steptoe, A. & P.J. Feldman. 2001. Neighborhood problems as sources of chronic stress: development of a measure of neighborhood problems and associations with socioeconomic status and health. *Ann. Behav. Med.* **23**: 177–185.
86. Feldman, P.J. & A. Steptoe. 2004. How neighborhoods and physical functioning are related: the roles of neighborhood socioeconomic status, perceived neighborhood strain, and individual health risk factors. *Ann. Behav. Med.* **27**: 91–99.
87. Ferrie, J., M.J. Shipley, S.A. Stansfeld, *et al.* 2002. Effects of chronic job insecurity and change in job security on self-reported health, minor psychiatric morbidity, physiological measures, and health-related behaviours in British civil servants: The Whitehall II study. *J. Epidemiol. Community Health* **56**: 450–454.
88. Bobak, M. & M. Marmot. 1996. East-West mortality divide and its potential explanations: proposed research agenda. *BMJ* **312**: 421–425.
89. Larsson, B., J. Seidell, K. Svardsudd, *et al.* 1989. Obesity, adipose tissue distribution and health in men—the study of men born in 1913. *Appetite* **13**: 37–44.
90. Brunner, E., J.T. Chandola & M.G. Marmot. 2007. Prospective effect of job strain on general and central obesity in the Whitehall II study. *Am. J. Epidemiol.* **165**: 828–837.
91. Gianaros, P.J., J.R. Jennings, L.K. Sheu., *et al.* 2007. Prospective reports of chronic life stress predict decreased grey matter volume in the hippocampus. *NeuroImage* **35**: 795–803.
92. Epel, E.S., E.H. Blackburn, J. Lin, *et al.* 2004. Accelerated telomere shortening in response to life stress. *Proc. Natl. Acad. Sci. USA* **101**: 17312–17315.
93. McEwen, B.S. 1998. Protective and damaging effects of stress mediators. *New Engl. J. Med.* **338**: 171–179.
94. McEwen, B.S. & T. Seeman. 1999. Protective and damaging effects of mediators of stress: elaborating and testing the concepts of allostasis and allostatic load. In *Socioeconomic Status and Health in Industrialized Nations: Social, Psychological and Biological Pathways*. Adler, N.E., M. Marmot, B.S. McEwen, B.S. & J. Stewart, Eds.: 30–47. Annals of the New York Academy of Sciences 896.
95. Singer, B., Ryff, C.D. & Seeman, T. 2004. Operationalizing allostatic load. In *Allostasis, Homeostasis, and the Costs of Physiological Adaptation*. Schulkin, J. Ed.: 1113–1149. Cambridge University Press, Cambridge, Massachusetts.
96. Seeman, T.E., E. Crimmins, M. Huang, *et al.* 2004. Cumulative biological risk and socio-economic differences in mortality: MacArthur studies of successful aging. *Social Sci. Med.* **58**: 1985–1997.
97. Karlamangla, A.S., B.H. Singer, D.R. Williams, *et al.* 2005. Impact of socioeconomic status on longitudinal accumulation of cardiovascular risk in young adults: The CARDIA Study (USA). *Social Sci. Med.* **60**: 999–1015.
98. Geronimus, A.T. 1992. The weathering hypothesis and the health of African-American women and infants: evidence and speculations. *Ethn. Dispar.* **2**: 207–21.
99. Geronimus, A.T., M. Hicken, D. Keene, J. Bound. 2006. “Weathering” and age patterns of allostatic load scores among Blacks and Whites in the United States. *Am. J. Public Health* **96**: 826–833.
100. Blackburn, E.H., C.W. Greider & J.W. Szostak. 2006. Telomeres and telomerase: the path from maize, Tetrahymena and yeast to human cancer and aging. *Nature Med.* **12**: 1133–1138.
101. Cawthon, R.M., K.R. Smith, E. O’Brien, *et al.* 2003. Association between telomere length in blood and mortality in people aged 60 years or older. *Lancet* **361**: 393–395.
102. Cherkas, L.F., A. Aviv, A.M. Valdes, *et al.* 2006. The effects of social status on biological aging as measured by white-blood-cell telomere length. *Aging cell* **5**: 361–365.
103. Barker, D.J.P. 1995. Fetal origins of coronary heart disease. *BMJ* **311**: 171–174.
104. Leon, D. & Y. Ben-Shlomo. 1997. Preadult influences on cardiovascular disease and cancer. In *A Life Course Approach to Chronic Disease Epidemiology*. Kuh, D. & Y. Ben-Shlomo Eds.: Oxford Medical Publications, Oxford.
105. Chen, E., D.A. Langer, Y.E. Raphaelson, *et al.* 2004. Socioeconomic status and health in adolescents: the role of stress interpretations. *Child Develop.* **75**: 1039–1052.
106. Diez Roux, A.V. 2000. Multilevel analysis in public health research. *Annu. Rev. Public Health* **21**: 171–192.
107. Diez Roux, A., E.J. Nieto, C. Muntaner, *et al.* 1997. Neighborhood environments and coronary heart disease: a multilevel analysis. *Am. J. Epidemiol.* **146**: 48–63.
108. Yen, I.H. & S.L. Kaplan. 1999. The social environment and health: a discussion of the epidemiologic literature. *Annu. Rev. Public Health* **20**: 287–308.
109. O’Campo, P., X. Lue, M. Wang, *et al.* 1997. Neighborhood risk factors for low birthweight in Baltimore: a multilevel analysis. *Am. J. Public Health* **87**: 1113–1118.

110. Estabrooks, P.A., R.E. Lee & N.C. Gyurcsik. 2003. Resources for physical activity participation: does availability and accessibility differ by neighborhood socioeconomic status? *Ann. Behav. Med.* **25**: 100–104.
111. Morland, K., S. Wing, A. Diez Roux, *et al.* 2001. Neighborhood characteristics associated with the location of food stores and food service places. *Am. J. Prev. Med.* **22**: 23–29.
112. Powell, L.M. 2007. Food store availability and neighborhood characteristics in the United States. *Prev. Med.* **44**: 189–195.
113. Roman, C.G. & A. Chalfin. 2008. Fear of walking outdoors: a multilevel ecologic analysis of crime and disorder. *Am. J. Prev. Med.* **34**: 306–312.
114. Adler, N.E. & J. Stewart. 2009. Reducing obesity: motivating action while not blaming the victim. *Milbank Q.* **87**: 49–70.
115. Winkleby, M., C. Cubbin & D. Ahn. 2006. Effect of cross-level interaction between individual and neighborhood socioeconomic status on adult mortality rates. *Am. J. Public Health* **96**: 2145–2153.
116. Veugelers, P.J., A.M. Yip & G. Kephart. 2001. Proximate and contextual socioeconomic determinants of mortality: multilevel approaches in a setting with universal health care coverage. *Am. J. Epidemiol.* **154**: 725–732.
117. Roos, L.L., J. Magoon, S. Gupta, *et al.* 2004. Socioeconomic determinants of mortality in two Canadian provinces: multilevel modeling and neighborhood context. *Social Sci. Med.* **59**: 1435–1447.
118. Borrell, L.N., A.V. Diez Roux, K. Rose, *et al.* 2004. Neighbourhood characteristics and mortality in the Artherosclerosis Risk in Communities Study. *Intl. J. Epidemiol.* **33**: 398–407.
119. Subramanian, S.V., J.T. Chen, D. Rehkopf, *et al.* 2005. Racial disparities in context: a multilevel analysis of neighborhood variations in poverty and excess mortality among black populations in Massachusetts. *Am. J. Public Health* **95**: 260–265.
120. Chen, E., A.D. Martin & K.A. Matthews. 2006. Understanding health disparities: the role of race and socioeconomic status in children's health. *Am. J. Public Health* **96**: 702–708.
121. Boyce, W.T., M. Champoux, S.J. Suomi, *et al.* 1995. Salivary cortisol in nursery-reared rhesus monkeys: reactivity to peer interactions and altered circadian activity. *Develop. Psychobiol.* **28**: 257–267.
122. Boyce, W.T. & B.J. Ellis. 2005. Biological sensitivity to context. I. An evolutionary-developmental theory of the origins and functions of stress reactivity. *Develop. Psychopathol.* **17**: 271–301.
123. Caspi, A., K. Sugden, T.E. Moffitt, *et al.* 2003. Influence of life stress on depression: moderation by a polymorphism in the 5-HTT gene. *Science* **301**: 386–389.
124. Taylor, S. E., B.M. Way, W.T. Welch, *et al.* 2006. Early family environment, current adversity, the serotonin transporter promoter polymorphism, and depressive symptomatology. *Biol. Psychiatry* **60**: 671–676.
125. Meaney, M. 2001. Maternal care, gene expression, and the transmission of individual differences in stress reactivity across eras. *Ann. Rev. Neurosci.* **24**: 1161–1192.
126. Galea, S., C. Hall & G.A. Kaplan. 2009. Social epidemiology and complex system dynamic modeling as applied to health behaviour and drug use research. *Intl. J. Drug Policy* **20**: 209–216.
127. Diez Roux, A.V. 2007. Integrating social and biologic factors in health research: a systems view. *Ann. Epidemiol.* **17**: 569–574.
128. Adler, N.E. & D.H. Rehkopf. 2008. U.S. disparities in health: descriptions, causes and mechanisms. *Annu. Rev. Public Health* **29**: 235–252.
129. Haas, S.A. 2006. Health selection and the process of social stratification: the effect of childhood health on socioeconomic attainment. *J. Health Soc. Behav.* **47**: 339–354.
130. Benezeval, M. & K. Judge. 2001. Income and health: the time dimension. *Soc. Sci. Med.* **52**: 1371–1390.
131. Snyder, S.E. & W.N. Evans. 2006. The effect of income on mortality: evidence from the social security notch. *Rev. Econ. Stat.* **88**: 482–495.
132. Frijters, P. 2005. The causal effect of income on health: evidence from German reunification. *J. Health Econ.* **24**: 997–1017.
133. Williams, D.R., M.V. Costa, A.O. Odunlami, *et al.* 2008. Moving upstream: how interventions that address the social determinants of health can improve health and reduce disparities. *J. Public Health Manage. Practice* November/Supplement: S8–S17.

SPECIFIC AIMS

Hospitalization has been reported to be associated with long-term decline in cognitive function among non-demented older adults. Understanding why is critically important because as many as one-third of all hospitalizations in the US involve elderly patients, a number expected to grow due to our rapidly aging society. A number of barriers limit our understanding of this phenomenon: 1) prehospital risk factors are almost completely unknown; 2) specific hospitalization characteristics, such as critical care, surgery, use of anesthesia, sepsis, and delirium have been implicated, but it remains unclear how these characteristics independently contribute to decline; and 3) there is little data on the underlying pathogenesis of cognitive decline after hospitalization. One hypothesis is that hospitalization ‘unmasks’ subclinical Alzheimer’s or other dementia-related pathologies, but few studies have been able to test this hypothesis. Most data come from hospital cohorts with short follow-up and no prehospital information on health or cognition. Without prospective study designs, it has not been possible to distinguish acceleration in rates of decline after hospitalization from prehospital cognitive changes, or to identify prehospital risk factors. In addition, there is almost no data to test whether the neuropathologies that underlie dementia, such as Alzheimer’s disease (AD) and vascular pathologies, also contribute to cognitive decline after hospitalization. **The overall goal of this research proposal is to identify prehospital risk factors and hospitalization characteristics that predict accelerated cognitive decline in older persons without dementia and to investigate whether subclinical dementia-related neuropathologies contribute to the development of cognitive decline after hospitalization.** This proposal will leverage a unique dataset combining data from longitudinal annual clinical assessment, neuropathologic evaluation, and in vivo neuroimaging, linked with comprehensive Medicare claims data for older community-dwelling participants in an aging cohort in order to achieve the following aims:

Aim 1. Identify prehospital risk factors for cognitive decline after hospitalization

- 1a. Test the hypothesis that risk factors for age-related cognitive decline and dementia are associated with accelerated cognitive decline after incident hospitalization in older persons without dementia
- 1b. Translational sub-aim: develop a prehospital risk profile to identify older adults at highest risk for accelerated cognitive decline after hospitalization

Aim 2. Determine specific hospitalization characteristics that independently predict cognitive decline

- 2a. Test the hypothesis that incident ICU stay, surgery, use of anesthesia, sepsis and delirium are each independently associated with accelerated rate of cognitive decline after hospitalization, controlling for risk factors from Aim 1 including severity of illness and prehospital cognition
- 2b. Exploratory sub-aim: Test the hypothesis that hospitalization occurrences and characteristics are associated with risk of incident MCI, dementia, and disability

Aim 3. Investigate the neuropathogenesis of cognitive decline after hospitalization using neuropathology and in vivo neuroimaging

- 3a. In persons without dementia with post-mortem assessment, test the hypothesis that subclinical pathologies (AD, vascular disease, Lewy bodies, TDP-43, and hippocampal sclerosis) and their combinations (mixed pathologies) are associated with accelerated cognitive decline after hospitalization
- 3b. Exploratory aim: Test the hypothesis that neuroimaging indicators of disease are associated with accelerated cognitive decline after hospitalization, including: cerebral and hippocampal atrophy (structural MRI) white matter hyperintensities (FLAIR), and white matter integrity (DTI)

This project will be paired with structured mentoring by a multi-disciplinary team of leaders in aging research and training in three areas: concepts in clinical dementia and cognitive impairment, use of electronic claims data for research, and understanding of neuropathology markers. I will fill important gaps in my training, while pursuing an important research topic. This will ultimately result in my submission of an R01.

Given the high frequency of hospitalization in the elderly and the growth of the older population, this project could have high impact. Identifying risk factors and harmful hospital characteristics could alter medical guidelines, hospital procedures, and health policy. Discerning the neuropathogenesis of cognitive decline after hospitalization has the potential to direct prevention and intervention as treatments become available. The more we understand how and why hospitalization can impair cognition, the better we can address a substantial cause of morbidity and decreased quality of life in our society. My research career will be dedicated to discovering this knowledge.

[Social Entrepreneurship in the Health Sciences to Accelerate Health Equity]

[Course Directors: Raj C. Shah; William Martin]

[Term: 2 Semesters]

Course overview narrative:

The overall goal of the course is to nurture the development of social entrepreneurship knowledge, attitudes, and skills in students in the health sciences. Through a process of guided, active adult-learning modules, this course will result in the learner developing a better understanding of the theoretical framework for social entrepreneurship in the health sciences and then apply knowledge to a real-world situation. Course learning objectives include: understanding the theory of social entrepreneurship, understanding prior ways of utilizing social entrepreneurship to address health equity issues, understanding the entrepreneurial mindset for facilitating high impact products, programs and services, develop an empathetic understanding of local community needs and opportunities by partnering with appropriate community members, identify a current problem or opportunity the community is facing to achieve health equity, develop a community-designed and tested solution for addressing the problem or seizing the opportunity, foster rapid cycle learning using Lean Start Up principles to implement the program and evaluate its feasibility to achieve desired growth of community capacity to achieve health equity. Growth will be demonstrated through advancing the design, evaluation, and sustainability of a student-led, community-based service learning activity.

Course Level Objectives (The learner will be able to...):

- A. The Theory of Social Entrepreneurship. Through the Theory of Social Entrepreneurship Module, the learner will be able to
 1. Provide a definition of social entrepreneurship
 2. Compare social entrepreneurship to other forms of entrepreneurship
- B. Social Entrepreneurship for Accelerating Health Equity. Through the Social Entrepreneurship for Accelerating Health Equity Module, the learner will be able to
 1. Define health equity
 2. Provide examples of how social entrepreneurship has been used to address health equity in communities
- C. Entrepreneurial Mindset. Through this Module, the learner will be able to
 1. Explain the dimensions of the Entrepreneurial Mindset
 2. Describe the evidence-based competencies of entrepreneurship
 3. Assess their personal strengths and weaknesses as it relates to the Entrepreneurial Mindset and Entrepreneurial Competencies
 4. Develop an individualized plan to address their development as a social entrepreneur
 5. Understand the importance of developing a mentorship team to guide their personal growth and development as a social entrepreneur
- D. Local Health Equity Need/Opportunity Identification. Through the Local Health Equity Need/Opportunity Identification Module, the learner will be able to
 1. Examine potential community health equity needs/opportunities identified through examining the Rush Community Health Needs Assessment (CHNA).
 2. Be able to generate and assess ideas for needs/opportunities to address based upon the Rush CHNA.
- E. Program Design for a Local Health Equity Need/Opportunity. Through the Program Design for a Local Health Equity Module, the learner will be able to
 1. Understand the framework for the design of a program initiative to address the local health equity need/opportunity
 2. Develop a program plan to address the local health equity need/opportunity
 3. Present the plan to stakeholders to seek feedback for revision and collective ownership
- F. Rapid Cycle Implementation and Evaluation. Through the Program Design for a Local Health Equity Module, the learner will be able to
 1. Understand the framework for Rapid Cycle Research as outlined by the AHRQ
 2. Compare Rapid Cycle Implementation/Evaluation model with Lean Start Up methodology
 3. Understand the RE-AIM framework for Evaluation
 4. Develop a rapid cycle implementation and evaluation plan for their program of interest
- G. Sustainable Dissemination to Achieve Community Capacity for Health Equity. Through the Sustainable Dissemination to Achieve Community Capacity Module, the learner will be able to
 1. Understand the key features for sustainable and scalable social entrepreneurship ventures
 2. Understand the elements of community capacity building and community organizing to achieve health equity
 3. Develop a sustainability and scalability plan for their venture of interest

Texts/Materials:

Materials usually are provided as links that are embedded into the individual course.

Resources: The Theory of Social Entrepreneurship

1. Selected Readings

Social Entrepreneurship for Accelerating Health Equity

1. Selected Readings

- a. Ramanathan A, Gupta A, Walk D, Carstens E. A Student-Driven Course Brings Medical Students into the Innovation Arena. *The Journal of Engineering Entrepreneurship*. 2015. 6(1): 13-21.
 - b. Kraft RJ. Service learning: an introduction to its theory, practice, and effects. *Education and Urban Society*. 1996. 28(2): 131-159.
 - c. Parsi K, List J. Preparing medical students for the world: service learning and global health justice. *Medscape Journal of Medicine*. 2008. 10(11): 268.
 - d. Omachonu, V. K., & Einspruch, N. G. (2010). Innovation in healthcare delivery systems: A conceptual framework. *The Innovation Journal: The Public Sector Innovation Journal*, 15(1), 1-20.
 - e. Jennings, L. (2014). Do men need empowering too? A systematic review of entrepreneurial education and microenterprise development on health disparities among inner-city Black male youth. *Journal of Urban Health*, 91 (5), 836-850.
2. Presentations by current entrepreneurs in other fields
3. Presentations by current entrepreneurs in health sciences

Entrepreneurial Mindset

1. Readings

- a. Carsud, A. & Brannback, M. (2011). Entrepreneurial motivations: what do we still need to know? *Journal of Small Business Management*, 49 (1), 9-26.
2. Entrepreneurial Intentions Questionnaire (EIQ)
3. Individual Social Entrepreneurship Plan Rubric
4. Potential Mentor List

Local Health Equity Need/Opportunity Identification

1. Community Health Needs/Opportunity Reports
2. Public Health Local, Regional, State, and Federal Reports
3. Interviews with Community Leaders

Program Design

1. Selected Published Work
2. Review of Program Plans
3. Incorporation of wisdom from community leaders
4. Program Rubric

Rapid Cycle Implementation and Evaluation

1. Johnson K, Gustafson D, Ewigman B, et al. Using Rapid-Cycle Research to Reach Goals: Awareness, Assessment, Adaptation, Acceleration. AHRQ Publication No. 15-0036. Rockville (MD): Agency for Healthcare Research and Quality; 2015
2. RE-AIM. <http://www.re-aim.hnfe.vt.edu/> for RE-AIM rubric
3. Implementation Plan Rubric
4. Evaluation Plan Rubric
5. Lean Start Up Rubric

Sustainable Dissemination to Achieve Community Capacity for Health Equity

1. Selected readings
 - a. Blank, S. (2013). Why the lean start-up changes everything. *Harvard Business Review*, 91 (5), 63-72.
 - b. Hochman, M. (2014). Improvement happens: Impacting health at its roots. *Journal of General Internal Medicine*, 29 (11), 1552-1556.
2. Sustainability plan rubric

Prerequisites: It is recommended that the learner is or has been actively engaged in a community-based volunteer service learning opportunity.

Software: The online course is placed on Blackboard.

| Session | Unit Objectives General Instructional Objectives ¹ | Professional Standards (AACM, LCME) | Specific Learning Outcomes ² | Learning Model, Content, Process | Assessments | Time Estimate (Mins) |
|----------|--|--|---|--|---|----------------------------|
| Module 0 | | | | Course introduction, self-introduction | | |
| Module 1 | | | | The Theory of Social Entrepreneurship | | |
| 1.1 | Provide a definition of social entrepreneurship | | Provide a working definition of social entrepreneurship | Selected readings; classroom instruction | Refer to 1.2 | |
| 1.2 | Compare social entrepreneurship to other forms of entrepreneurship | | Compare and contrast social entrepreneurship to other forms of entrepreneurship | Selected readings; classroom instruction; presentations by current entrepreneurs in other fields; presentations by current entrepreneurs in health sciences. | Two-page essay on encompassing the following: (1) definition of social entrepreneurship; (2) analysis of a comparison and contrast of social entrepreneurship to other types of entrepreneurship. | 120 |
| Module 2 | | | | Social Entrepreneurship for Accelerating Health Equity | | |
| 2.1 | Define Health Equity | | | Selected readings; classroom instruction | Refer to 2.2 | |
| 2.2 | Provide examples of how social entrepreneurship has been used to address community health equity | | | Selected readings; classroom instruction | One-page Infograph defining health equity and illustrating two examples of how social entrepreneurship is used to address community health equity. | 180 |
| Module 3 | | | | Entrepreneurial Mindset | | |
| 3,1 | Explain the dimensions of the | | | Selected readings; classroom instruction | Refer to 3.4 below. | |

¹ "An intended outcome of instruction that has been stated in general enough terms to encompass a domain of student performance..."(Gronlund, 2009, p. 13).

² "An intended outcome of instruction that has been stated in terms of specific observable student performance... Specific learning outcomes describe the types of performance that learners will be able to exhibit when they have achieved a general instructional objective (specific learning outcomes are also called specific objectives, performance objectives, and measureable objectives)" (Gronlund, 2009, p. 13).

| Session | Unit Objectives General Instructional Objectives ¹ | Professional Standards (AACM, LCME) | Specific Learning Outcomes ² | Learning Model, Content, Process | Assessments | Time Estimate (Mins) |
|----------|---|--|---|---|--|----------------------------|
| | Entrepreneurial Mindset | | | | | |
| 3.2 | Describe the evidence-based competencies of entrepreneurship. | | | Selected readings; classroom instruction | Refer to 3.4 below. | |
| 3.3 | Assess personal strengths and weaknesses as it related to the Entrepreneurial Mindset and Entrepreneurial Competencies. | | | Selected readings; classroom instruction | Self-administer the Entrepreneurial Mindset Survey and identify your assessed strengths and weaknesses regarding your Entrepreneurial Mindset by documenting these into a single PowerPoint slide. | 60 |
| 3.4 | Develop individualized plan to address their development as a social entrepreneur. | | | Selected readings; classroom instruction | Based upon your results from the Entrepreneurial Mindset Survey above, write a two-page individual plan to strengthen your competencies and address your weaknesses. The plan should address how you plan to address competency gaps and how to partner with others to complement your strengths and weaknesses. | 300 |
| 3.5 | Understand the importance of developing a mentorship team to guide their personal growth and development as a social entrepreneur. | | | Selected readings; classroom instruction | Refer to 3.4 above. | |
| Module 4 | | | | Local Health Equity Need/Opportunity Identification | | |

| Session | Unit Objectives General Instructional Objectives ¹ | Professional Standards (AACM, LCME) | Specific Learning Outcomes ² | Learning Model, Content, Process | Assessments | Time Estimate (Mins) |
|----------|---|--|---|---|--|----------------------------|
| 4.1 | Examine potential community health equity needs/opportunities identified through Rush CHNA. | | | Selected readings; classroom instruction | In assigned groups, identify the top three immediate (one year) and long term (greater than 5 years) needs & opportunities and present to the entire class lasting no more than 15 minutes with 10 minutes for discussion. | 300 |
| 4.3 | Be able to generate and assess ideas for potential needs/opportunities to address based upon the Rush CHNA. | | | Selected readings; classroom instruction | In assigned groups, complete the Idea Napkin to generate ideas and assess ideas and be prepared to pitch results to the entire class. | 120 |
| Module 5 | | | | Program Design for a Local Health Equity Need/Opportunity | | |
| 5.1 | Understand the framework for design of a program initiative to address a local health equity need/opportunity | | | Selected readings; classroom instruction | Quiz on the business model canvas and 3-year operational budget. | 180 |
| 5.2 | Develop a program plan to address the local health equity need/opportunity | | | Selected readings; classroom instruction | Five-page venture plan using the business model canvas and 3-year operational budget. | 1200 |
| 5.3 | Present the plan to stakeholders to seek feedback for revision and collective ownership | | | Selected readings; classroom instruction | One-page analysis of process, feedback obtained and concrete actions to take based upon the feedback. | 300 |
| Module 6 | | | | Rapid Cycle Implementation and Evaluation | | |

| Session | Unit Objectives General Instructional Objectives ¹ | Professional Standards (AACM, LCME) | Specific Learning Outcomes ² | Learning Model, Content, Process | Assessments | Time Estimate (Mins) |
|----------|---|--|---|---|--|----------------------------|
| 6.1 | Understand the framework for Rapid Cycle Research as outlined by the AHRQ | | | Selected readings; classroom instruction | See 6.2 | |
| 6.2 | Compare Rapid Cycle Implementation & Evaluation model with Lean Start Up Methodology | | | Selected readings; classroom instruction | Quiz comparing/contrasting Rapid Cycle Model to Lean Start Up Model. | 120 |
| 6.3 | Understand the RE-AIM framework for Evaluation | | | Selected readings; classroom instruction | Complete a RE-AIM rubric for their program of interest | 180 |
| 6.4 | Develop a rapid cycle implementation and evaluation plan for their program of interest | | | Selected readings; classroom instruction | Submit a written implementation and evaluation plan for their program. Present to classmates and stakeholders to seek feedback for improvement | 480 |
| Module 7 | | | | Sustainable Dissemination to Achieve Community Capacity for Health Equity | | |
| 7.1 | Understand the key features for sustainable and scalable social entrepreneurship ventures | | | Selected readings; classroom instruction | Interview summary with social entrepreneur. | 240 |
| 7.2 | Understand the elements of community capacity building and community | | | Selected readings; classroom instruction | Two-page analysis of Rush CHNA to identify which elements related to community capacity building and community organizing are written in the plan. | 180 |

| Session | Unit Objectives General Instructional Objectives ¹ | Professional Standards (AACM, LCME) | Specific Learning Outcomes ² | Learning Model, Content, Process | Assessments | Time Estimate (Mins) |
|---------|---|--|---|--|---|----------------------------|
| | organizing to achieve health equity | | | | | |
| 7.3 | Develop a sustainability plan for the venture | | | Selected readings; classroom instruction | Two-page sustainability plan of the venture focusing upon resources. | 360 |

Plasma Levels of Nutrients Involved in Phospholipid Synthesis, Incident Dementia due to Alzheimer's Disease, and Cognitive Decline in Community-Dwelling Older Adults

Dementia due to Alzheimer's disease affects 5.4 million persons in the United States. Loss of synapses, a membrane-rich structure, is an early change associated with dementia due to Alzheimer's disease. Animal models point to nutrients involved in the Kennedy pathway including uridine, docosahexaenoic acid, and choline being important components for the production of membrane phospholipids that support synapse. While recent clinical trials with a food product formulated to contain these nutrients in combination with other vitamins and trace minerals have shown cognitive benefit in treatment naïve persons with mild dementia due to Alzheimer's disease, whether Alzheimer's disease is associated with nutrient deficiencies in uridine, docosahexaenoic acid, and choline has not been fully explored.

The overall goal of this proposal is to determine if lower plasma levels of nutrients involved in synaptic membrane phospholipid synthesis are related to an increased incidence of dementia due to Alzheimer's disease and cognitive decline in community-dwelling older. A secondary aim is to explore whether the pathway linking between lower plasma nutrient levels and cognitive decline involves greater Alzheimer's disease neuropathology along with loss of synapse density due to lower levels of certain membrane phospholipids. The Rush Memory and Aging Project is a longitudinal, clinical pathologic study of aging in older, community-dwelling men and women initially without known dementia. Participants agreed to plasma sample collection and storage at baseline and annual follow-up along with brain donation for detailed pathologic analysis at time of death. Leveraging the frozen plasma samples, detailed annual cognitive function data in over 1400 participants and neuropathology measures along with brain tissue to measure neocortical synapse density and membrane phospholipid levels in over 300 now-deceased participants, we propose the following specific aims:

PRIMARY AIMS: For all participants initially without known dementia and available cognitive function testing and annual frozen plasma samples,

1. Assay uridine, docosahexaenoic acid, and choline levels along with other vitamin and mineral levels to (a) assess the distribution of plasma nutrient levels and the temporal stability of plasma nutrient measures, (b) determine the correlation between plasma nutrient levels and with other vitamin and trace mineral levels, and (c) examine how demographics, dietary nutrient intake, supplement intake, body mass index, and vascular diseases and risk factors influence plasma nutrient levels; and,
2. Determine the relationship between plasma nutrient levels and incident dementia due to Alzheimer's disease, along with global and specific domain cognitive function decline.

SECONDARY AIMS: In deceased persons with available neuropathology data and brain tissue,

1. Determine the association between plasma nutrient levels and (a) global cognitive decline, (b) Alzheimer's disease, infarct, and Lewy Body pathology, (c) synaptic density, and (d) neocortical phosphatidylethanolamine and plasmalogen levels
2. Examine if the association between lower plasma nutrient levels and global cognitive decline is explained by the pathway of reduced membrane phospholipid levels resulting in lower synaptic density and greater presence of Alzheimer's disease neuropathology.

The results of this proposal will provide greater insight into whether Alzheimer's disease in community-dwelling older persons is associated with deficiencies in plasma nutrients involved in phospholipid synthesis through the Kennedy pathway and amenable to interventions with medical foods.

Budget and Budget Justification for Research Funding

Jennifer Garcia, CRA

Director, Sponsored Programs

Office of Research Affairs

- Purpose and Importance
- What to Consider
- Budget Categories
- The Components of a Budget
- Common Errors

Budget is a key element; it should be:

- Feasible
- Complete
- Reasonable
- Useful tool to manage the award

Always consider the Funding Opportunity Announcement (FOA) and the sponsor guidelines to determine criteria:

- Period of support
- Funding limit (overall or categorical)
- Type of budget (modular or detailed)
- Is prior approval required: NIH applications >\$500k direct cost in any year
- Matching and/or cost share requirements
- Allowable and unallowable costs

Allowable

- Salaries (NIH salary cap: currently \$187,100)
- Equipment (needed for the project)
- Supplies (includes equipment under \$5K)
- Travel
- Consultants
- Consortiums
- Alterations & Renovations
- Other (equipment maintenance costs, animal costs, fee for service)

Unallowable

- Bad debt (200.426)
- Alcohol (200.423)
- Improper payments (200.428)
- Advertising (200.421), except for recruitment, procurement of goods, disposal of scraps/surplus materials, program outreach
- Public relations (200.421), except for costs required by the federal awardee
- Alumni/ae Activities (200.421)

Then consider what you need to accomplish the research proposed in the Scope of Work (SOW).

| | |
|------------------------|--------|
| Personnel and Staff | Space |
| Materials and Supplies | Travel |

Build Your Team

- Co-Investigators
- Multiple PI Project
- Consultants
- Collaborators

Consider Personnel Costs

- About 80% of your budget

Determine Institutional Resources

- Share equipment with other investigators
- Access Core Facilities

<https://www.rushu.rush.edu/research/rush-core-laboratories-0>

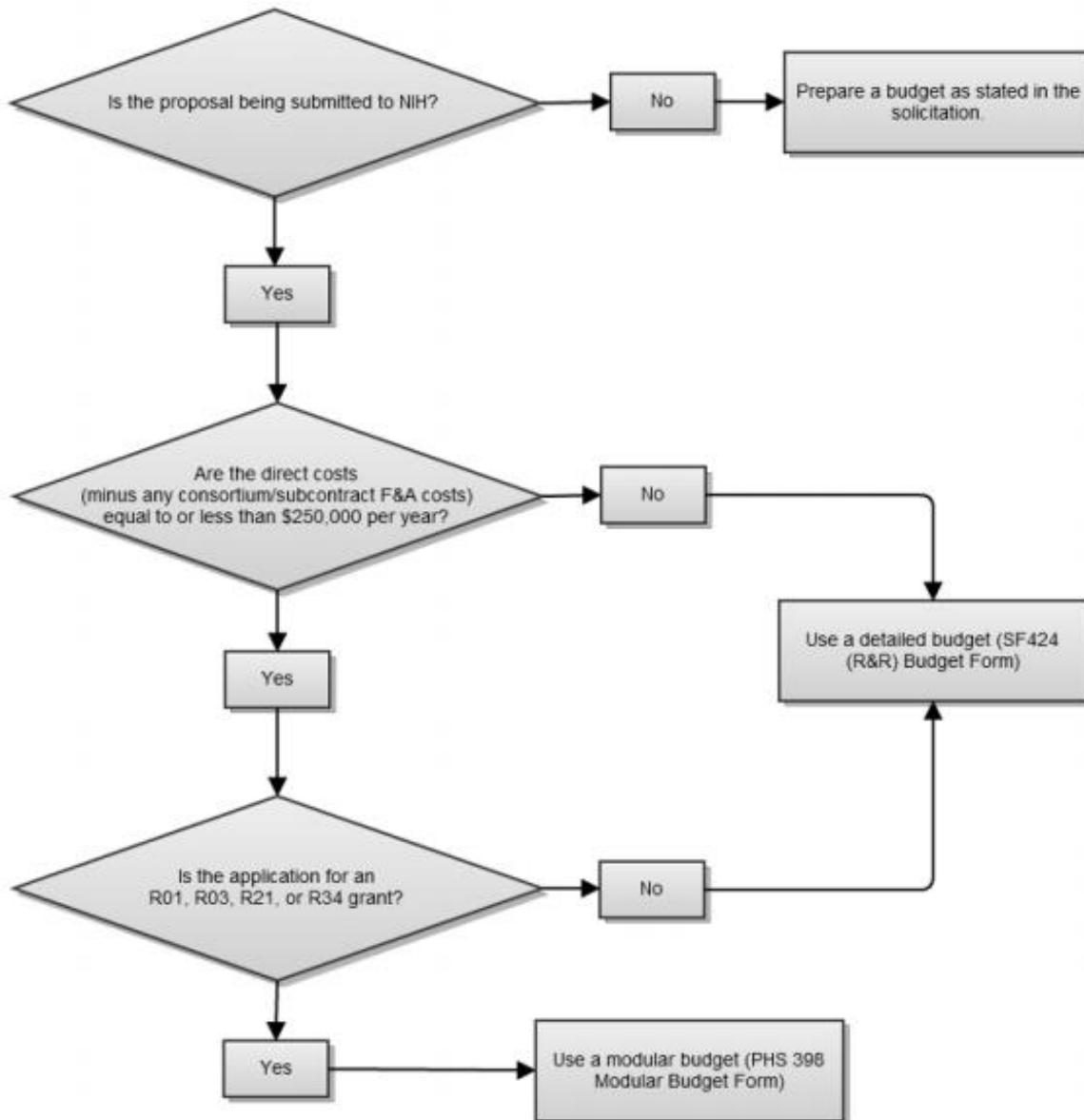
Direct Costs

| | |
|---------------------------|--|
| Personnel | Salaries, and fringe benefits. |
| Equipment | Specifically for the project. |
| Travel | Professional meetings to present results. |
| Other Direct Costs | Materials, supplies, consultants, publication, consortium. |

Facilities & Administrative Costs (F&A)

| | |
|----------------------|---|
| F&A Costs | Costs that are incurred for common or joint objectives and, therefore, cannot be identified readily and specifically with a particular project. |
|----------------------|---|

Types of Budgets



Modular Budgets used for
“R” Activity codes:
R01, R03, R21, R34 and
some U01

Applications with annual direct cost \leq \$250k/yr
use Modular Budgets:

- Budget is built on “modules” of \$25,000
- Used for “R” activities (R01, R03, R21, R34)
- Consortium Costs are not included in the indirect costs

Our office still requires a detailed budget for review before a modular budget is submitted.

Personnel Justification

- Name
- Role
- Person-months

Consortium Justification

- Total costs rounded to the nearest \$1,000
- Name, Role and Person-months
- State if consortium site is foreign

Additional Narrative Justification

- Explain any variation in modules

Detailed budgets are used for:

- NIH applications with annual direct cost > \$250k/yr
- All other federal agencies
- Career Development Awards (K): salary, materials, supplies
- Institutional Training Grants (T)
- Fellowship Applications (F): tuition & fees
- SBIR/STTR applications
- Research Project Grants
- Applications from foreign institutions

Personnel:

Senior/Key Personnel (Section A)

Other Personnel (Section B)

- Base Salary
 - NIH Salary Cap \$187,000
- Effort
- Fringe Benefits

Equipment

- Equipment is defined as having an acquisition cost of > \$5,000 and a useful life of > 1 year
 - Must be primarily allocated to the proposed research project
 - Excluded from F&A base

Travel

- Travel costs can be included for travel to present results of the grant
 - 1-2 meetings/ year
 - 2-3 personnel
 - \$1,000 - \$2,000/ scientific meeting/ individual/ year
- Travel for data collection, to access resources or unique instrumentation or tools may be request

<http://inside2.rush.edu/policies/Pages/default.aspx>

<http://www.gsa.gov/federaltravelregulation>

Other Direct Costs

- Materials and Supplies
 - glassware, chemicals, animal costs etc.
- Publication costs
- Equipment maintenance
- Consultants
- Shared facility fees
- Consortium/subcontractors

Personnel: List each individual, role, person-month effort. Explain specific responsibilities and justify any fluctuations in effort and/or staffing levels in out years.

Equipment: Required especially if similar equipment is already available.

Travel: Clearly state how travel is related to completing the aims and goals of the proposed research. Include the destination, number of people traveling and dates or duration of stay.

Other Direct Costs:

Materials and Supplies: Indicate general categories and include an amount for each category. Include specific details on animal estimates.

http://inside2.rush.edu/departments/crc/Pages/Fee_Schedule.aspx

Indirect Costs: Calculated on Modified Total Direct Costs (MTDC)

- DHHS Approved Rate: 57%
- MTDC Base excludes:
 - Capital equipment > \$5,00
 - Alterations and renovations
 - Portion of each subaward in excess of \$25k
 - Patient Care Costs
 - Rental/maintenance of off-site activities
 - Tuition, scholarships and fellowships

- Exceeding the FOA budget amount
- Submission of modular budget, when detailed budget is required
- Budget exceeds \$500k DC without prior approval
- Costs in budget differ from the justification
- Salaries exceed the NIH salary cap
- Miscalculation of F&A

- Read the FOA
- Understand the requirements of the FOA/sponsor
- Submit the correct budget format (modular/detailed)
- Avoid budget submission errors
- Ask NIH or SPA if you have questions

Thank you! Questions?

Sponsored Programs Administration

Contact Info:

[Jennifer Garcia](#)

Director, Sponsored Programs Administration

Phone: (312) 942-3554

[Yvonne Harris](#)

Senior Grant and Subaward Specialist

Phone: (312) 563-1990

[Lorraine Gibson](#)

Grant and Subaward Specialist

Phone: (312) 942-2411

[Jennifer Stadler](#)

Grant and Subaward Specialist

Phone: (312) 563-1989

- http://grants.nih.gov/grants/about_grants.htm
- <http://grants.nih.gov/grants/funding/424/index.htm#inst>
- https://grants.nih.gov/grants/funding/modular/modular_faq_pub.htm
- <https://www.niaid.nih.gov/grants-contracts/plan-budget-personnel>
- <https://regionalseminars.od.nih.gov/neworleans2017/presentations/>

- <https://www.rushu.rush.edu/research/office-research-affairs/sponsored-programs-administration/sponsored-research-resources>
- <http://inside2.rush.edu/policies/Pages/default.aspx>
- <http://www.gsa.gov/federaltravelregulation>
- http://inside2.rush.edu/departments/crc/Pages/Fee_Schedule.aspx

The Non-Scientific Components of a Grant Proposal

Jennifer Garcia, CRA

Director, Sponsored Programs

Office of Research Affairs

- Explore various sections of an application and why each is important.
- Discover the page limits for specific programs and activity codes (fellowship, individual career development, institutional training, R01, R03, R21 and others).
- Learn the ins and outs of formatting - Choosing an appropriate filename and understanding font and margin guidelines.

Non-Scientific Components

- Project title
- Project summary
- Total cost of project
- Funds requested from sponsor
- Name, position, address, phone number, email, and fax number of PI
- Signature block for PI
- Signature block for authorized administrative official
- Name, position, address, phone number, email, and fax number of authorized administrative official

- **For applications requiring approval to submit:**
 - Grants requesting \$500,000 or more in direct costs for any year.
 - Conference grants (R13 or U13).
 - Investigator-initiated clinical trial planning and implementation awards.
- **Genomic data** - Explain that the proposed study will generate large-scale human or non-human genomic data. Also note if you plan to access data in the NIH genome-wide association study (GWAS) data repository.
- **Late applications** - Include the reason your application is late. Continuous submission. Indicate that you are a member of an NIH study section qualified to submit at a nonstandard time.
- **Video** - Indicate that you plan to send video files later.

- **Point out RFAs and PAs** - State the title if you're responding to an initiative.
- **Note special areas** - Note the involvement of human subjects, select agents, or other areas with special requirements.
- **Note a subaward** that will be active for only some of the grant's years.

In the past, applicants also used the cover letter to list expertise needed to review the application and to request assignment. However, that is now listed in the PHS Assignment Request Form instead.

Facilities & Other Resources

- Describe how the scientific environment contributes to the probability of success.
 - If there are multiple performance sites, describe the resources available at each site.
 - Describe any special facilities used for working with biohazards and any other potentially dangerous substances.
- For early stage investigators (ESIs), describe institutional investment in the success of the investigator. Your description may include the following elements:
 - resources for classes, travel, or training;
 - collegial support, such as career enrichment programs, assistance and guidance in the supervision of trainees involved with the ESI's project, and availability of organized peer groups;
 - logistical support, such as administrative management and oversight and best practices training;
 - financial support, such as protected time for research with salary support.

- NIH does not require a specific citation format.
- The use of "et al." in place of listing all authors of a publication is acceptable practice.
- Remember to comply with NIH public access policy by including the PMC reference number (PMCID) when citing applicable papers that you author or that arise from your NIH-funded research.
- Beginning with application due dates on or after May 25, 2017, you are allowed to cite interim research products.

Note: interim research products have specific citation requirements.

Direct Costs

| | |
|---------------------------|--|
| Personnel | Salaries, and fringe benefits. |
| Equipment | Specifically for the project. |
| Travel | Professional meetings to present results. |
| Other Direct Costs | Materials, supplies, consultants, publication, consortium. |

Facilities & Administrative Costs (F&A)

| | |
|----------------------|---|
| F&A Costs | Costs that are incurred for common or joint objectives and, therefore, cannot be identified readily and specifically with a particular project. |
|----------------------|---|

Personnel: List each individual, role, person-month effort. Explain specific responsibilities and justify any fluctuations in effort and/or staffing levels in out years.

Equipment: Required especially if similar equipment is already available.

Travel: Clearly state how travel is related to completing the aims and goals of the proposed research. Include the destination, number of people traveling and dates or duration of stay.

Other Direct Costs:

Materials and Supplies: Indicate general categories and include an amount for each category. Include specific details on animal estimates.

NIH Biographical Sketch Requirements

- Required for competing applications and progress reports.
- Must be completed by all senior/key personnel and other significant contributors.
- May not exceed **five pages** in length per person.
- Must be in .pdf file format as an attachment to the SF424 or RPPR.
- The PD/PI must fill in their eRA Commons User Name.
- CANNOT include:
 - Figures
 - Tables
 - Graphics
 - Embedded or attached files (e.g. video, graphics, sound, data)

Education/Training

- List initial professional education first, Include postdoctoral, residency, and clinical fellowship training, as applicable, noting each separately.
- For each entry provide:
 - the name and location of the institution
 - the degree received (if applicable)
 - the month and year of end date (or expected end date).
For fellowship applicants only, also include the month and year of start date.
 - the field of study (for residency entries, the field of study should reflect the area of residency training).

Sample Education/Training

OMB No. 0925-0001 and 0925-0002 (Rev. 09/17 Approved Through 03/31/2020)

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Hunt, Morgan Casey

eRA COMMONS USER NAME (credential, e.g., agency login): huntmc

POSITION TITLE: Associate Professor of Psychology

EDUCATION/TRAINING (*Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.*)

| INSTITUTION AND LOCATION | DEGREE (if applicable) | Completion Date MM/YYYY | FIELD OF STUDY |
|------------------------------------|---------------------------|----------------------------|--------------------------------|
| University of California, Berkeley | B.S | 05/1990 | Psychology |
| University of Vermont | Ph.D. | 05/1996 | Experimental Psychology |
| University of California, Berkeley | Postdoctoral | 08/1998 | Public Health and Epidemiology |

A. Personal Statement

- Brief justification of why the person is well-suited for their role(s) in this project. Relevant factors may include: aspects of their training; previous experimental work on this specific topic or related topics; technical expertise; collaborators or scientific environment; and/or past performance in this or related fields.
- Up to **four publications** or research products may be cited in each biosketch that highlight their experience and qualifications for this project. Interim research products are allowed. **Note:** interim research products have specific citation requirements. See https://grants.nih.gov/grants/interim_product_faqs.htm for more information.

Sample Personal Statement

A. Personal Statement

I have the expertise, leadership, training, expertise and motivation necessary to successfully carry out the proposed research project. I have a broad background in psychology, with specific training and expertise in ethnographic and survey research and secondary data analysis on psychological aspects of drug addiction. My research includes neuropsychological changes associated with addiction. As PI or co-Investigator on several university- and NIH-funded grants, I laid the groundwork for the proposed research by developing effective measures of disability, depression, and other psychosocial factors relevant to the aging substance abuser, and by establishing strong ties with community providers that will make it possible to recruit and track participants over time as documented in the following publications. In addition, I successfully administered the projects (e.g. staffing, research protections, budget), collaborated with other researchers, and produced several peer-reviewed publications from each project. As a result of these previous experiences, I am aware of the importance of frequent communication among project members and of constructing a realistic research plan, timeline, and budget. The current application builds logically on my prior work. During 2005-2006 my career was disrupted due to family obligations. However, upon returning to the field I immediately resumed my research projects and collaborations and successfully competed for NIH support.

1. Merryle, R.J. & Hunt, M.C. (2004). Independent living, physical disability and substance abuse among the elderly. *Psychology and Aging*, 23(4), 10-22.
2. Hunt, M.C., Jensen, J.L. & Crenshaw, W. (2007). Substance abuse and mental health among community-dwelling elderly. *International Journal of Geriatric Psychiatry*, 24(9), 1124-1135.
3. Hunt, M.C., Wiechelt, S.A. & Merryle, R. (2008). Predicting the substance-abuse treatment needs of an aging population. *American Journal of Public Health*, 45(2), 236-245. PMID: PMC9162292 Hunt, M.C., Newlin, D.B. & Fishbein, D. (2009). Brain imaging in methamphetamine abusers across the life-span. *Gerontology*, 46(3), 122-145.

B. Position and Honors

- List in **chronological order from earliest to latest** the positions held that are relevant to the application, concluding with their present position. List any relevant academic and professional achievements and honors. In particular:
 - Students, post doctorates, and junior faculty should include scholarships, traineeships, fellowships, and development awards, as applicable.
 - Clinicians should include information on any clinical licensures and specialty board certifications that they have achieved.

Sample Position and Honors

B. Positions and Honors

Positions and Employment

| | |
|-----------|---|
| 1998-2000 | Fellow, Division of Intramural Research, National Institute of Drug Abuse, Bethesda, MD |
| 2000-2002 | Lecturer, Department of Psychology, Middlebury College, Middlebury, VT |
| 2001- | Consultant, Coastal Psychological Services, San Francisco, CA |
| 2002-2005 | Assistant Professor, Department of Psychology, Washington University, St. Louis, MO |
| 2007- | Associate Professor, Department of Psychology, Washington University, St. Louis, MO |

Other Experience and Professional Memberships

| | |
|---------|--|
| 1995- | Member, American Psychological Association |
| 1998- | Member, Gerontological Society of America |
| 1998- | Member, American Geriatrics Society |
| 2000- | Associate Editor, Psychology and Aging |
| 2003- | Board of Advisors, Senior Services of Eastern Missouri |
| 2003-05 | NIH Peer Review Committee: Psychobiology of Aging, ad hoc reviewer |
| 2007-11 | NIH Risk, Adult Addictions Study Section, members |

Honors

| | |
|------|---|
| 2003 | Outstanding Young Faculty Award, Washington University, St. Louis, MO |
| 2004 | Excellence in Teaching, Washington University, St. Louis, MO |
| 2009 | Award for Best in Interdisciplinary Ethnography, International Ethnographic Society |

C. Contributions to Science

- **Senior/key persons** should complete the "Contributions to Science" section except candidates for research supplements to promote diversity in health-related research who are high school students, undergraduates, and post-baccalaureates.

Format:

- Up to **five** of the applicant's most significant **contributions** to science can be described. The description of each contribution should be no longer than **one half page, including citations**. For each contribution, cite up to **four publications** or research products that are relevant to the contribution.

Content:

Each contribution should include:

- the historical background that frames the scientific problem
- central finding(s)
- influence of the finding(s) on the progress of science or the application of those finding(s) to health or technology
- applicant's specific role in the described work
- Cite only published papers to support each contribution.
- A URL may be provided to a full list of published work. This URL must be to a Federal Government website (a .gov suffix). **Providing a URL to a list of published work is not required.**

Sample Contributions to Science

C. Contribution to Science

1. My early publications directly addressed the fact that substance abuse is often overlooked in older adults. However, because many older adults were raised during an era of increased drug and alcohol use, there are reasons to believe that this will become an increasing issue as the population ages. These publications found that older adults appear in a variety of primary care settings or seek mental health providers to deal with emerging addiction problems. These publications document this emerging problem but guide primary care providers and geriatric mental health providers to recognize symptoms, assess the nature of the problem and apply the necessary interventions. By providing evidence and simple clinical approaches, this body of work has changed the standards of care for addicted older adults and will continue to provide assistance in relevant medical settings well into the future. I served as the primary investigator or co-investigator in all of these studies.
 - a. Gryczynski, J., Shaft, B.M., Merryle, R., & Hunt, M.C. (2002). Community based participatory research with late-life addicts. American Journal of Alcohol and Drug Abuse, 15(3), 222-238.
 - b. Shaft, B.M., Hunt, M.C., Merryle, R., & Venturi, R. (2003). Policy implications of genetic transmission of alcohol and drug abuse in female nonusers. International Journal of Drug Policy, 30(5), 46-58.
 - c. Hunt, M.C., Marks, A.E., Shaft, B.M., Merryle, R., & Jensen, J.L. (2004). Early-life family and community characteristics and late-life substance abuse. Journal of Applied Gerontology, 28(2), 26-37.
 - d. Hunt, M.C., Marks, A.E., Venturi, R., Crenshaw, W. & Ratonian, A. (2007). Community-based intervention strategies for reducing alcohol and drug abuse in the elderly. Addiction, 104(9), 1436-1606. PMID: PMC9000292

Complete List of Published Work in MyBibliography:

<http://www.ncbi.nlm.nih.gov/sites/myncbi/collections/public/1PgT7IEFIAJBtGMRDdWFmjWAO/?sort=date&direction=ascending>

D. Additional Information: Research Support and/or Scholastic Performance

Note the following instructions for specific subsets of applicants/candidates:

- High school students are *not* required to complete Section D.
- Career development award applicants should complete the "Research Support" section but skip the "Scholastic Performance" section.
- Generally, the following types of applicants can skip the "Research Support" section and must complete **only** the "Scholastic Performance" section. However, when these applicants also have Research Support, they may complete both sections.
 - applicants for predoctoral and postdoctoral fellowships
 - applicants to dissertation research grants
 - candidates for research supplements to promote diversity in health-related research from the undergraduate through postdoctoral levels

D. Additional Information: Research Support and/or Scholastic Performance

Research Support

- Ongoing and completed research projects from the **past three years** should be listed.
- Briefly describe the overall goals of the projects and the applicant's responsibilities.
- **Do not include the number of person months or direct costs.**

D. Sample Additional Information

Research Support

D. Additional Information: Research Support and/or Scholastic Performance

Ongoing Research Support

R01 DA942367 Hunt (PI) 09/01/08-08/31/16
Health trajectories and behavioral interventions among older substance abusers
The goal of this study is to compare the effects of two substance abuse interventions on health outcomes in an urban population of older opiate addicts.
Role: PI

R01 MH922731 Merryle (PI) 12/15/07-11/30/15
Physical disability, depression and substance abuse in the elderly
The goal of this study is to identify disability and depression trajectories and demographic factors associated with substance abuse in an independently-living elderly population.
Role: Co-Investigator

Faculty Resources Grant, Washington University 08/15/09-08/14/15
Opiate Addiction Database
The goal of this project is to create an integrated database of demographic, social and biomedical information for homeless opiate abusers in two urban Missouri locations, using a number of state and local data sources.
Role: PI

Completed Research Support

R21 AA998075 Hunt (PI) 01/01/11-12/31/13
Community-based intervention for alcohol abuse
The goal of this project was to assess a community-based strategy for reducing alcohol abuse among older individuals.
Role: PI

D. Additional Information: Research Support and/or Scholastic Performance

Scholastic Performance

Postdoctoral applicants

List by institution and year **only all** graduate scientific and/or professional courses with grades. In addition, explain any grading system used if it differs from a 1-100 scale; an A, B, C, D, F system; or a 0-4.0 scale. Also indicate the levels required for a passing grade.

Additional Components

- **Equipment**
 - List major items of equipment already available for the project. If appropriate, identify the equipment's location and capabilities.
- **Foreign Justification** (if applicable)
 - Describe special resources or characteristics of the research project, including the reasons why the facilities or other aspects of the proposed project are more appropriate than a domestic setting.
- **Letters of Support**
 - Include any letters necessary to demonstrate the support of consortium participants and collaborators such as Senior/Key Personnel and Other Significant Contributors included in the grant application.
- **Multiple PI Leadership Plan**
 - A rationale for choosing a multiple PD/PI approach should be described.
 - Organizational structure of the leadership team
 - Communication plans
 - Processes for making decisions on scientific direction
 - Procedures for resolving conflicts

Formatting and Page Limits

- Use simple PDF-formatted files
 - Disable security (e.g., password protection, encryption)
 - Do not use “bundling” or “portfolio” features which combine multiple documents into a single file by providing links to the individual files.
- Keep filenames to 50 characters or less (including spaces)
 - Avoid the use of ampersand (&) since it requires special formatting.
- Use meaningful and unique filenames.
- Do not include headers or footers.
 - Section headings as part of the text (e.g., Significance, Innovation, Approach) are encouraged
- Follow guidelines for fonts and margins.
 - Updated Jan. 2017 – [NOT-OD-17-030](#)

- Ensure file size is greater than 0 bytes - NIH cannot accept a 0 byte attachment.
- Keep attachment file size to 100 MB or less per Grants.gov recommendation.

- **Font size:** Must be 11 points or larger. Smaller text in figures, graphs, diagrams and charts is acceptable, as long as it is legible when the page is viewed at 100%.
 - Some PDF conversion software reduces font size. It is important to confirm that the final PDF document complies with the font requirements.
- NIH recommends the following fonts, although other fonts (both serif and non-serif) are acceptable if they meet the line spacing requirements.
 - Arial
 - Georgia
 - Helvetica
 - Palatino Linotype

- **Type density:** Must be no more than 15 characters per linear inch (including characters and spaces).
- **Line spacing:** Must be no more than six lines per vertical inch.
- **Text color:** No restriction. Though not required, black or other high-contrast text colors are recommended since they print well and are legible to the largest audience.

Applications that include PDF attachments that do not conform to the minimum requirements listed above may be withdrawn from consideration.

- Do not include headers or footers in your attachments. NIH will add headers, footers, page numbers, bookmarks and a table of contents when we assemble your grant application upon submission.
- Headings (e.g., Significance, Innovation) within the text of your attachments improve readability and are highly encouraged.
 - Some funding opportunity announcement and form instructions provide guidance on organizing the content of attachments including specific headings that must be present.

- Hyperlinks and URLs are only allowed when specifically noted in funding opportunity announcement (FOA) and form field instructions.
 - The use of hyperlinks is typically limited to citing relevant publications in biosketches and publication lists. It is highly unusual for a FOA to allow links in Specific Aims, Research Strategy and other page-limited attachments.
- Hyperlinks and URLs may not be used to provide information necessary to application review.
 - Reviewers are not obligated to view linked sites and are cautioned that they should not directly access a website (unless the link to the site was specifically requested in application instructions) as it could compromise their anonymity.
- When allowed, you must hyperlink the actual URL text so it appears on the page rather than hiding the URL behind a specific word or phrase.
 - Examples:
 - NIH (<http://www.nih.gov/>)
 - <http://www.nih.gov/>

- Digital images of material such as electron micrographs or gels must only be included within the page limits of the Research Strategy.
 - The maximum size of images to be included should be approximately 1200 x 1500 pixels using 256 colors. Figures must be readable as printed on an 8.5" x 11" page at normal (100%) scale.
- Investigators must use image compression such as JPEG or PNG.
 - Do not include figures or photographs as separate attachments either in the Appendix or elsewhere in the application.

- Adhere to the page limits defined in the Table of Page Limits (next slide) or within the text of the funding opportunity announcement (FOA).
 - Page limits defined in a FOA should be followed when different than those found in the table of page limits.
- NIH systematically checks many page limit requirements and provide error or warning messages to minimize incomplete or non-compliant applications.
- Some page limits apply to multiple attachments that when combined must stay within a designated limit.
- Do not use the appendix or other sections of your application to circumvent page limits ([NOT-OD-11-080](#)).

Page Limits



R01, R03, R21, and all other applications

| Section of Application | Activity Codes | Page Limits * (if different from FOA, FOA supersedes) |
|---|--|--|
| Project Summary/Abstract | For all Activity Codes | 30 lines of text |
| Project Narrative | For all Activity Codes excluding C06,UC6 and G20. | three sentences |
| Introduction to Resubmission and Revision Applications | For all Activity Codes (including each applicable component of a multi-component application) | 1 |
| Specific Aims | For all Activity Codes that use an application form with the Specific Aims section (including each component of a multi-component application) | 1 |
| Research Strategy | For Activity Code DP1 | 5 |
| | For Activity Codes R03 , R13 , U13 , R13 , U13 , R21 , R35 , R36 , R41 , R43 , SC2 , SC3 , X01¹ , X02¹ , R50 , UT1 | 6 |
| | For Activity Code DP2 | 10 |
| | For Activity Codes DP3 , DP5 , G08 , G11 , G13 , RC2 , RC4 , RF1 , R01 , R15 , R18 , R21 / R33 , R24 , R28 , R33 , R34 , R42 , R44 , R61 / R33 , SB1 , SC1 , SI2 , UB1 , UC2 , UH2 , UH3 , UG1 , UC4 , UF1 , UG3 / UH3 , UH2 / UH3 , U01 , U18 , U24 , U2C , U34 , U42 , U44 , UT2 , X01¹ , X02¹ | 12 |
| | For all other Activity Codes | Follow FOA instructions |
| Commercialization Plan | For Activity Codes R42 , R44 , SB1 , UT2 , U44 , UB1 (Attachment 7 on SBIR/STTR Information form) | 12 |
| Biographical Sketch | For all Activity Codes (including DP1 and DP2 which previously had special page limits) | 5 |

Page Limits



Individual Career Development K Awards (excluding K12 applications)

| Section of Application | Page Limits * (if different from FOA, FOA supersedes) |
|---|---|
| Project Summary/Abstract | 30 lines of text |
| Project Narrative | Three sentences |
| Introduction to Resubmission or Revision Application (when applicable) | 1 |
| Candidate Information and Goals for Career Development and Research Strategy | 12 (for both attachments combined) |
| Specific Aims | 1 |
| Training in the Responsible Conduct of Research | 1 |
| Candidate's Plan to Provide Mentoring (Include only when required by the specific FOA, e.g., K24 and K05) | 6 |
| Plans and Statements of Mentor and Co-mentor(s) | 6 |
| Letters of Support from Collaborators, Contributors, and Consultants | 6 |
| Description of Institutional Environment | 1 |
| Institutional Commitment to Candidate's Research Career Development | 1 |
| Biographical Sketch | 5 |

Fellowship (F) Applications

| Section of Application | Page Limits * (if different from FOA, FOA supersedes) |
|--|---|
| Project Summary/Abstract | 30 lines of text |
| Project Narrative | Three sentences |
| Introduction to Resubmission or Revision Application (when applicable) | 1 |
| Applicant's Background and Goals for Fellowship Training | 6 |
| Specific Aims | 1 |
| Research Strategy | 6 |
| Respective Contributions | 1 |
| Selection of Sponsor and Institution | 1 |
| Training in the Responsible Conduct of Research | 1 |
| Sponsor and Co-Sponsor Statements | 6 |
| Letters of Support from Collaborators, Contributors, and Consultants | 6 |
| Description of Institutional Environment and Commitment to Training | 2 |
| Note: This page limit includes the Additional Educational Information required for F30 and F31 applications. | |
| Applications for Concurrent Support (when applicable) | 1 |
| Biographical Sketch | 5 |

Thank you! Questions?

Sponsored Programs Administration

Contact Info:

[Jennifer Garcia](#)

Director, Sponsored Programs Administration

Phone: (312) 942-3554

[Yvonne Harris](#)

Senior Grant and Subaward Specialist

Phone: (312) 563-1990

[Lorraine Gibson](#)

Grant and Subaward Specialist

Phone: (312) 942-2411

[Jennifer Stadler](#)

Grant and Subaward Specialist

Phone: (312) 563-1989

<https://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/format-attachments.htm>

<https://grants.nih.gov/grants/how-to-apply-application-guide.html>

<https://www.niaid.nih.gov/grants-contracts/additional-application-elements>

<https://grants.nih.gov/grants/how-to-apply-application-guide/format-and-write/page-limits.htm#other>

<https://grants.nih.gov/grants/how-to-apply-application-guide/forms-e/general-forms-e.pdf>

https://grants.nih.gov/grants/multi_pi/

©opyright in the Classroom

Jennifer Westrick, MSLIS

Reference Librarian

Heather Kartsounes, JD

Legal Affairs

Rush University Medical Center
Teaching Academy Series
February 20, 2018

IT'S HOW MEDICINE SHOULD BE®

Introduction

- Copyright **Awareness** Team
 - Members are librarians, instructional designers, lawyers, printers and more
- Team mission: Make resources available
- Heather Kartsounes, JD, from Rush's Legal Affairs department

Presentation will be set up as follows:

- Review an important concept in copyright
 - Define concept
 - Show some resources
 - Give an example
- Rush's copyright policy #OP-0365
- Practical tips
- Legal Affairs
- Questions (please hold until the end)

<http://rushu.libguides.com/libraryhomepage>

RUSH | Library of Rush University Medical Center
and McCormick Educational Technology Center (METC)



HOME RESEARCH SERVICES ABOUT HELP

Log In

ASK A QUESTION

HOURS & DIRECTIONS

Quick Links

Databases

e-Journals

e-Books

Catalog

CHAT

Databases

CINAHL Complete

Ovid

Psychiatry Online (incl. DSM Premium)

PsycINFO

PubMed

Scopus

UpToDate

All Databases...

Resources

Access Medicine

ClinicalKey

InCites Journal Citation Reports

Mobile Resources

Nursing Reference Center

RefWorks

VisualDx

Copyright Resources **New**

Services

Dissertation & Thesis Formatting

Electronic Reserves

Faculty Publications Database

Interlibrary Loan

ILLiad Login

Library Account Registration/Update

Renew Books and Media

Schedule an Appointment

Rush

My Apps

University Portal

RULearning

Rush Archives

Rush Email

Rush University

Library News

Contact Us



<https://rushu.libguides.com/copyright-resources>

HOME
RESEARCH ▾
SERVICES ▾
ABOUT ▾
HELP ▾

- Introduction ▾
- Practical Steps to Take
- Licensing and Access
- Fair Use
- Creative Commons
- Open Access
- Public Domain
- Court Decisions of Interest
- Resources and Institutional Policies
- Plagiarism vs Copyright Infringement
- Theses and Dissertations
- FAQs
- Examples

Levels of Copyright Protection

"Can I use this?" is often not a question with a clear-cut answer. This page provides important guidelines and offers links to additional resources.

We hear you asking, "How can I tell?" Here's how.

| | |
|-------------------------|---|
| Fair Use | "Fair Use" provides allowances for educational use. Instructors must be careful about compliance. |
| Open Access | "Open Access" does <i>not</i> mean "free of copyright." Many of these articles contain copyright notices. Click the "Creative Commons" link to the left for more information. |
| Copyright Symbol | Look for a copyright symbol. If you see one, the work is copyrighted. Click the "Creative Commons" link to the left for more information. |
| No Restrictions | "No Restrictions" means the item is in the public domain or is a government-produced work and most items in the public domain are in the public domain. |

Copyright Background

- Face-to-face exception
- Digital Millennium Copyright Act (DMCA)
- TEACH Act (Technology Education and Copyright Harmonization)



Fair Use

What is it?



“Man on the street” interviews might say

- “it’s a way to ‘get around’ copyright”
- “allows educators to use whatever we want”

Fair Use

- Fair use is a loophole in the copyright law that allows someone other than the copyright holder to copy and distribute copyrighted material under certain conditions without first obtaining permission.
- The law specifically allows fair use for such purposes as criticism, comment, news reporting, **teaching, and scholarship or research.**
- Fair use is not clearly defined.
- **Main guidelines: the four tenets**

From *The Librarian' Guide to Intellectual Property in the Digital Age* by Tom Wherry

These four Tennants?



Photo credit: BBC

No, these four tenets

- the **purpose** and character of your use
- the **nature** of the copyrighted work
- the **amount** and substantiality of the portion taken, and
- the **effect** of the use upon the potential market

Rush Copyright Policy #OP-0365

Appendix A (part 1 of 4)

PURPOSE

Favoring Fair Use

- Teaching (including multiple copies for classroom use)
- Research
- Scholarship
- Nonprofit Educational Institution
- Criticism
- Comment
- News reporting
- Transformative or Productive use (changes the work for new utility)
- Restricted access (to students or other appropriate group)
- Parody

Opposing Fair Use

- Commercial activity
- Profiting from the use
- Entertainment
- Bad-faith behavior
- Denying credit to original author

Adapted with permission from a checklist available in "Copyright Law for Librarians and Educators," by Kenneth D. Crews (ALA Editions, 2006).

Rush Copyright Policy #OP-0365

Appendix A (part 1 of 4)

PUI

Favoring Fair Use

- Teaching (including multiple copies for classroom use)
- Restricted access (to students or other appropriate group)

Rush Copyright Policy #OP-0365

Appendix A (part 2 of 4)

NATURE

Favoring Fair Use

- Published work
- Factual or nonfiction based
- Important to favored educational objectives

Opposing Fair Use

- Unpublished work
- Highly creative work (art, music, novels, films, plays)
- Fiction

Adapted with permission from a checklist available in "Copyright Law for Librarians and Educators," by Kenneth D. Crews (ALA Editions, 2006).

Rush Copyright Policy #OP-0365

Appendix A (part 3 of 4)

AMOUNT

Favoring Fair Use

- Small quantity
- Portion used is not central or significant to entire work
- Amount is appropriate for favored educational purpose

Opposing Fair Use

- Large portion or whole work used
- Portion used is central to work or "heart of the work"

Adapted with permission from a checklist available in "Copyright Law for Librarians and Educators," by Kenneth D. Crews (ALA Editions, 2006).

Rush Copyright Policy #OP-0365

Appendix A (part 4 of 4)

| EFFECT | |
|---|--|
| <i>Favoring Fair Use</i> | <i>Opposing Fair Use</i> |
| <input type="checkbox"/> User owns lawfully acquired or purchased copy of original work | <input type="checkbox"/> Could replace sale of copyrighted work |
| <input type="checkbox"/> One or few copies made | <input type="checkbox"/> Significantly impairs market or potential market for copyrighted work or derivative |
| <input type="checkbox"/> No significant effect on the market or potential market for copyrighted work | <input type="checkbox"/> Reasonably available licensing mechanism for use of the copyrighted work |
| <input type="checkbox"/> No similar product marketed by the copyright holder | <input type="checkbox"/> Affordable permission available for using work |
| <input type="checkbox"/> Lack of licensing mechanism | <input type="checkbox"/> Numerous copies made |
| | <input type="checkbox"/> You made it accessible on Web or in other public forum |
| | <input type="checkbox"/> Repeated or long term use |

Adapted with permission from a checklist available in "Copyright Law for Librarians and Educators," by Kenneth D. Crews (ALA Editions, 2006).

Rush Copyright Policy #OP-0365

Appendix A (part 4 of 4)

EFFECT

Opposing Fair Use

- Could replace sale of copyrighted work
- Significantly impairs market or potential market for copyrighted work or derivative
- Reasonably available licensing mechanism for use of the copyrighted work
- Affordable permission available for using work
- Numerous copies made
- You made it accessible on Web or in other public forum
- Repeated or long term use



Fair Use Evaluator

What this tool can do for you:

- Help you better understand how to determine the "fairness" of a use under the U.S. Copyright Code.
- Collect, organize & archive the information you might need to support a fair use evaluation.
- Provide you with a time-stamped, PDF document for your records [\[example\]](#), which could prove valuable, should you ever be asked by a copyright holder to provide your fair use evaluation and the data you used to support it. [\[why is this important?\]](#)
- Provide access to educational materials, external copyright resources, and contact information for copyright help at local & national levels.

What this tool cannot do for you:

- This tool does not provide legal advice. It records the information you provide it as well as your own judgment on the fairness of the use. See the tool [\[disclaimer\]](#) for more information.
- Only a court of law can definitively rule on whether a use is fair or unfair. This tool does not assume or predict a court outcome.



Make a Fair Use
Evaluation




Learn More about
Fair Use

Context [Optional]

Your Name:

Your Job Title:

Your Institution:

Date of Intended Use: Feb ▾ 18 ▾ 2018 

Title of Work to be Used [?](#):

Author/Copyright Holder [?](#):

Publication Status: published unpublished unknown

Publisher:

Place of Publication:

Publication Year [?](#):

Brief Description of Work [?](#):

Factor #1 Purpose

Describe the Purpose and character of your intended use and how that relates to Fair Use: [\[get help in describing this\]](#)

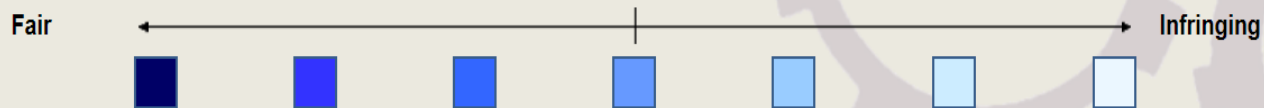
[\[Optional\]](#) Indicate how "fair" you feel the Purpose of your intended use is (based on the information you've provided above) by clicking on the appropriate box on the continuum below: [\[disclaimer\]](#)



Factor #2 Nature

Describe the Nature of the copyrighted work and how that relates to Fair Use: [\[get help in describing this\]](#)

[\[Optional\]](#) Indicate how "fair" you feel the Nature of the copyrighted work is (based on the information you've provided above) by clicking on the appropriate box on the continuum below: [\[disclaimer\]](#)



Factor #3 Amount

Describe the Amount of your intended use in relation to the copyrighted work as a whole and how that relates to Fair Use: [\[get help in describing this\]](#)

[\[Optional\]](#) Indicate how "fair" you feel the Amount of your intended use is (based on the information you've provided above) by clicking on the appropriate box on the continuum below: [\[disclaimer\]](#)



Factor #4 Effect

Describe the Effect of your intended use on the market or potential value of the copyrighted work and how that relates to Fair Use: [\[get help in describing this\]](#)

[\[Optional\]](#) Indicate how "fair" you feel the Effect of your intended use is (based on the information you've provided above) by clicking on the appropriate box on the continuum below: [\[disclaimer\]](#)



Level of Fairness

Based on the responses you've provided, your "level of fairness" for the Four Factors is: [\[don't see one?\]](#)

- This "level" is simply the mathematical average of the evaluations you have provided for each of the four factors. It should not be misunderstood as a true measure of the fairness of your proposed use. [\[disclaimer\]](#)
- The creators of this tool strongly suggest you consider these results only as a general indicator of fairness, which should always be validated by considering all factors holistically. For more information, please see: [\[it's not quite that simple\]](#)



[◀ Back](#)

Other Factors

[\[Optional\]](#) Describe any Other Factors or Reasoning that You Feel Bear on the Overall Fairness of your Use (and then select from one of the options below):

Based on this evaluation, I have determined this use is (select one) [\[?\]](#):

Fair Unfair I'm undecided Purge Information & Start Over Create a PDF of this Fair Use Evaluation

* For any information on how your local institution suggests you use this document, click on [\[Local Copyright Information\]](#). Click here for our [\[privacy statement\]](#). If you'd like to provide feedback on this tool, let us know how you used it, or share your evaluation with us, please email Carrie Russell at the ALA Washington Office at: crussell@alawash.org

Purge
Information
& Start
Over

Create a
PDF of
this Fair
Use
Evaluation

* For any information on how your local institution suggests you use this document, click on [\[Local Copyright Information\]](#). Click here for our [\[privacy statement\]](#). If you'd like to provide feedback on this tool, let us know how you used it, or share your evaluation with us, please email Carrie Russell at the ALA Washington Office at: crussell@alawash.org

Local Copyright Information
© 2008 Michael Brewer & ALA Office for Information Technology Policy



Creative Commons licenses

Widely-used copyright licenses that offer various levels of copyright protections



This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.



[Attribution \(by\)](#)

All CC licenses require that others who use your work in any way **must give you credit** the way you request.



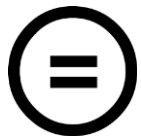
[ShareAlike \(sa\)](#)

You let others copy, distribute, display, perform, and modify your work, as long as they distribute any modified work **on the same terms**.



NonCommercial (nc)

You let others copy, distribute, display, perform, modify and use your work for **any purpose other than commercial gain.**



NoDerivatives (nd)


You let others copy, distribute, display and perform **only original** copies of your work.

Creative Commons licenses

| | |
|--|---|
|  | No rights reserved CC0 |
|  | Attribution CC BY |
|  | Attribution-NoDerivs CC BY-ND |
|  | Attribution-NonCommercial CC BY-NC |
|  | Attribution-ShareAlike CC BY-SA |
|  | Attribution-NonCommercial-ShareAlike CC BY-NC-SA |
|  | Attribution-NonCommercial-NoDerivs CC BY-NC-ND |

Example



 Jumpchart takes the pain out of website planning. Sign up for free today, ads via Carbon

 Pixabay
Source: pixabay.com

 Free Download



 Collect

 Donate

CC0 License


✓ Free for personal and commercial use

✓ No attribution required

[Learn more about the license »](#)

Example



 Jumpchart takes the pain out of website planning. Sign up for free today, ads via Carbon

 Pixabay
Source: pixabay.com

 Free Download



 Collect

 Donate

CC0 License

✓ Free for personal and commercial use

✓ No attribution required

[Learn more about the license »](#)

Example

CC0 License

- ✓ Free for personal and commercial use
- ✓ No attribution required

[Learn more about the license »](#)

Public Domain



Works that are in the public domain may be used freely, without obtaining permission from or compensating the copyright owner.

Works may qualify as being in the public domain for a variety of reasons, including the following:

- The **copyright has expired**
- The work was **produced by the U.S. federal government**
- The work **does not have sufficient originality**
- The author used a **CCO license**

Public Domain



A few words of caution:

- the presentation could be under copyright: Bach's music is in the public domain, but a certain performance by a certain symphony is not.
- even though it's free of copyright restrictions it might still have patent or trademark restrictions.
- because it's publicly available on the internet doesn't mean it is in the public domain.
- different from Open Access, which often has copyright restrictions.

Open Access



Another thoroughly misunderstood concept

Open Access Does Not Mean “Free of Copyright Restrictions”

- Open Access is a publishing approach that allows access to research without having to pay a subscription.
- Several funding institutions require Open Access publishing for works that are a direct result of their funding. This includes the US Government (NIH, CDC, AHRQ), the Bill and Melinda Gates Foundation, the Wellcome Trust and many others.
- PubMed Central is widely believed to be 100% Open Access; it is actually about half OA

PubMed Central

NCBI Resources How To

PMC
US National Library of Medicine
National Institutes of Health

PMC

[Journal List](#) [Advanced](#)



PMC

PubMed Central® (PMC) is a free full-text archive of biomedical and life sciences journal literature at the U.S. National Institutes of Health's National Library of Medicine (NIH/NLM).

NCBI Resources How To

PMC

US National Library of Medicine
National Institutes of Health

Create alert Journal List Advanced

Article attributes Author manuscripts Digitized back issues Open access Retracted

Text availability Include embargoed articles

Publication date 1 year 5 years 10 years Custom range...

Research Funder NIH AHRQ ASPR CDC EPA FDA NASA NIST

Display Settings: Summary, 20 per page, Sorted by Default

Search results

Items: 1 to 20 of 556053

[Diabetes insipidus: The other diabetes](#)

1. Sanjay Kalra, Abdul Hamid Zargar, Sunil M. Jain, Bipin Kumar Singh, Nihal Thomas, A. G. Unnikrishnan, Pooja Indian J Endocrinol Metab. 2016 Jan-Feb; 20(1): 9–21. doi: 10.4103/ijem.2015.158887
PMCID: PMC4743391
[Article](#) [PubReader](#) [Citation](#)

[A novel therapeutic effect of statins on nephrogenic diabetes](#)

2. Leonilde Bonfrate, Giuseppe Procino, David Q-H Wang, J Cell Mol Med. 2015 Feb; 19(2): 265–282. Published online 2014 Dec 15.
PMCID: PMC4407600
[Article](#) [PubReader](#) [PDF-535K](#) [Citation](#)

[Monogenic Diabetes: What It Teaches Us on the Complexity of Diabetes](#)

3. **Diabetes**

NCBI Resources [v] How To [v]


PMC US National Library of Medicine National Institutes of Health

PMC diabetes | Create alert Journal List Advanced

Article attributes clear Display Settings: Summary, 20 per page, Sorted by Default order

Author manuscripts

Digitized back issues

 **Open access**

Retracted

Text availability

Include embargoed articles

Publication date

1 year

5 years

10 years

Custom range...

Research Funder

NIH

AHRQ

ASPR

CDC

EPA

FDA

NASA

NIST

Search results

Items: 1 to 20 of 271274 << First < P

i Filters activated: Open access. [Clear all](#) to show 556053 items.

Diabetes insipidus: The other diabetes

1. Sanjay Kalra, Abdul Hamid Zargar, Sunil M. Jain, Bipin Sethi, Kumar Singh, Nihal Thomas, A. G. Unnikrishnan, Piya Ballan
Indian J Endocrinol Metab. 2016 Jan-Feb; 20(1): 9–21. doi: 10.4103/22
PMCID: PMC4743391
[Article](#) [PubReader](#) [Citation](#)

A novel therapeutic effect of statins on nephrogenic diabetes

2. Leonilde Bonfrate, Giuseppe Procino, David Q-H Wang, Mari
J Cell Mol Med. 2015 Feb; 19(2): 265–282. Published online 2015 Jan
PMCID: PMC4407600
[Article](#) [PubReader](#) [PDF-535K](#) [Citation](#)

Wolfram Syndrome in the Japanese Population; Molecular

NCBI Resources How To

PMC US National Library of Medicine National Institutes of Health

diabetes | Create alert Journal List Advanced

Article attributes Author manuscripts Digitized back issues **Open access** Retracted Text availability Include embargoed articles Publication date 1 year

Display Settings: Summary, 20 per page, Sorted by Default order

Search results

Items: 1 to 20 of 271274

Filters activated: Open access. Clear all to show 556053 items.

[Diabetes insipidus: The other diabetes](#)

1. Saniav Kalra, Abdul Hamid Zargar, Sunil M. Jain, Binin Sethi

What is the PMC Open Access subset? Isn't everything in PMC open access?

The majority of the articles in PMC are subject to traditional copyright restrictions. They are free to access, but they are not Open Access articles in the specialized sense of that term.

The PMC Open Access Subset contains articles that are still protected by copyright, but are made available under a Creative Commons or similar license that generally allows more liberal redistribution and reuse than a traditional copyrighted work. See the [PMC Open Access Subset](#) page for more information on how you may retrieve and use these articles.

Text availability


Include embargoed articles

Publication date

 1 year
 5 years
 10 years
 Custom range...

Research Funder

 NIH
 AHRQ
 ASPR
 CDC
 EPA
 FDA
 NAS
 NIST

 Filters activated: Open access. [Clear all](#) to show 556053 items.

 [Diabetes insipidus: The other diabetes](#)

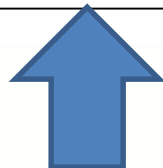
 1. Sanjay Kalra, Abdul Hamid Zargar, Sunil M. Jain, Bipin Sethi, Kumar Singh, Nihal Thomas, A. G. Unnikrishnan, Piya Ballan
 Indian J Endocrinol Metab. 2016 Jan-Feb; 20(1): 9–21. doi: 10.4103/22
 PMID: PMC4743391
[Article](#) [PubReader](#) [Citation](#)
 [A novel therapeutic effect of statins on nephrogenic diabetes](#)

2. Leonilde Bonfrate, Giuseppe Procino, David Q-H Wang, Mari

Diabetes insipidus: The other diabetes

[Sanjay Kalra](#), [Abdul Hamid Zargar](#),¹ [Sunil M. Jain](#),² [Bipin Sethi](#),³ [Subhankar Chowdhury](#),⁴ [Awadhesh Kumar Singh](#),^{5,6} [Nihal Thomas](#),⁷ [A. G. Unnikrishnan](#),⁸ [Piya Ballani Thakkar](#),⁹ and [Harshad Malve](#)¹⁰

[Author information](#) ► [Copyright and License information](#) ►



[Author information ▶](#) [Copyright and License information ▼](#)

Copyright : © Indian Journal of Endocrinology and Metabolism

This is an open access article distributed under the terms of the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 License, which allows others to remix, tweak, and build upon the work non-commercially, as long as the author is credited and the new creations are licensed under the identical terms.

Monogenic Diabetes: What It Teaches Us on the Common Forms of Type 1 and Type 2 Diabetes

[Yisheng Yang](#)[✉] and [Lawrence Chan](#)[✉]

[Author information](#) ▶ [Article notes](#) ▶ [Copyright and License information](#) ▼

[Copyright](#) © 2016 by the Endocrine Society



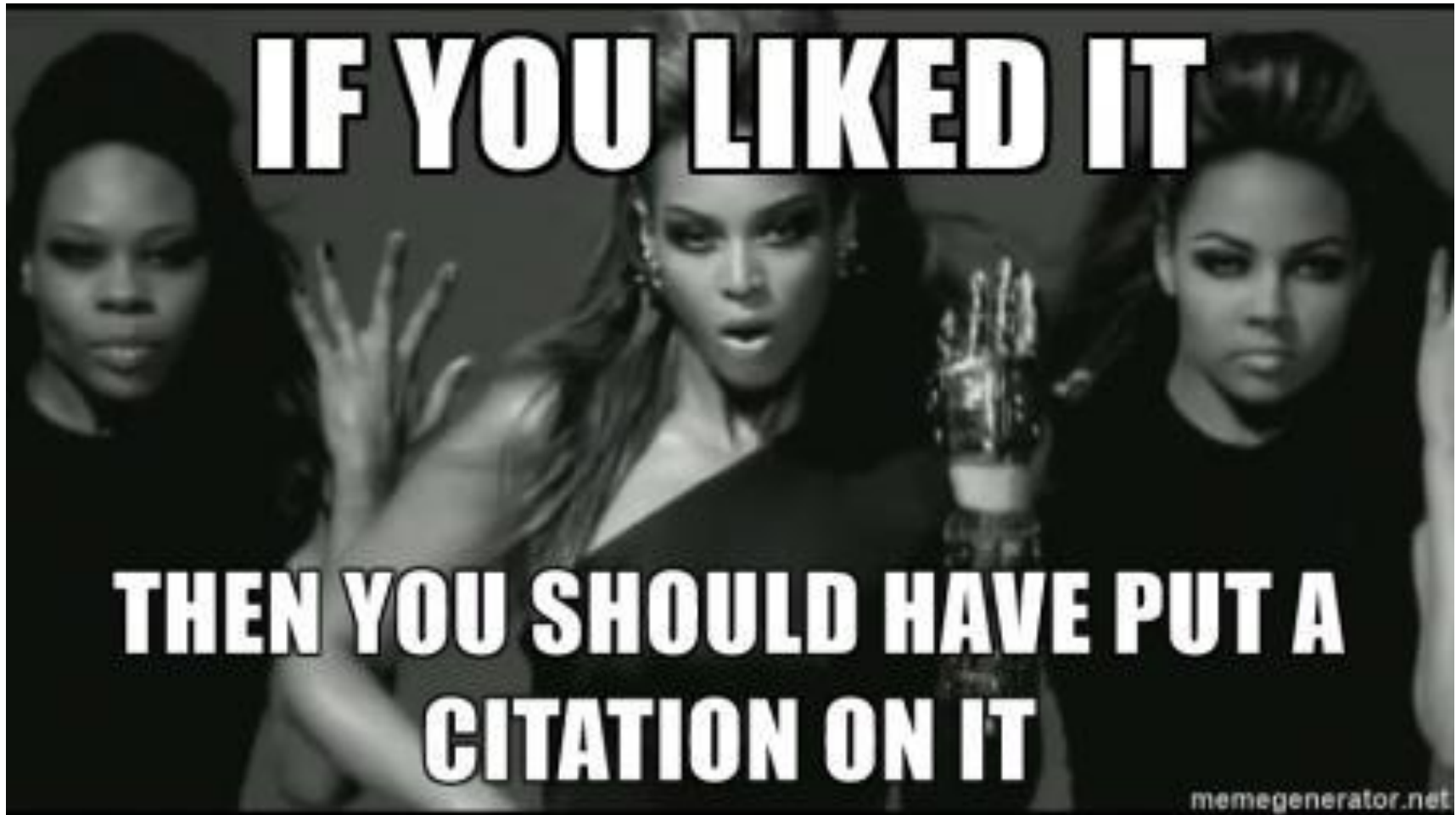
Open Access



**Open Access Does Not Mean
“Free of Copyright Restrictions”**

Copyright vs Plagiarism

- Copyright is a legal concept
- Plagiarism is about giving credit where credit is due



<https://memegenerator.net/instance/66047236/beyonce-put-a-ring-on-it-if-you-liked-it-then-you-should-have-put-a-citation-on-it>

E-Reserves

Warning! The requested course page is currently password protected.

NSG523 - Research for Evidence-based Practice (Spring 2018) - Buchholz, Cothran, Inventor, Phillips, Worley

Please be advised that to use electronic material, you must agree to the following by clicking the 'Accept' button below:

The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials. Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction. One of these specified conditions is that the photocopy or reproduction is not to be used for any purpose other than private study, scholarship, or research. If a user makes a request for, or later uses, a photocopy or reproduction for purposes in excess of fair use that user may be liable for copyright infringement.

Please enter the course page password in the box below and click the 'Accept' button to continue.

For larger type, see next screen..

E-Reserves, from the Library of RUMC's website request form

- The copyright law of the United States (Title 17, United States Code) governs the making of photocopies or other reproductions of copyrighted materials. Under certain conditions specified in the law, libraries and archives are authorized to furnish a photocopy or other reproduction. One of these specified conditions is that the photocopy or reproduction is not to be used for any purpose other than private study, scholarship, or research. If a user makes a request for, or later uses, a photocopy or reproduction for purposes in excess of fair use, that user may be liable for copyright infringement.

So What's an Educator to Do? (1 of 2)

- Refer to the Copyright Resources guide on the library website
- Refer to RUMC Copyright Policy #OP-0365
- Get familiar with the four Fair Use tenets and follow their guidance
 - Limit materials to small excerpts
 - Limit distribution to a defined audience
 - Don't copy and distribute something for which you had to pay

So What's an Educator to Do? (2 of 2)

- Get permission before posting
- Keep a paper trail
- Refresh your materials every semester and remove expired e-reserves promptly
- Don't re-use an illegal posting
- Include copyright notices
- Check copyright on articles/books that you've written
- Use links - not PDFs - to direct students to an article
- When in doubt, call Legal Affairs

Where to go for more information

<http://rushu.libguides.com/libraryhomepage>



RUSH | Library of Rush University Medical Center
and McCormick Educational Technology Center (METC)

RUSH ARCHIVES

HOME RESEARCH SERVICES ABOUT HELP Log In ASK A QUESTION HOURS & DIRECTIONS

Quick Links Databases e-Journals e-Books Catalog

| Databases | Resources | Services | Rush |
|---------------------------------------|----------------------------------|-------------------------------------|-------------------|
| CINAHL Complete | Access Medicine | Dissertation & Thesis Formatting | My Apps |
| Ovid | ClinicalKey | Electronic Reserves | University Portal |
| Psychiatry Online (incl. DSM Premium) | InCites Journal Citation Reports | Faculty Publications Database | RULearning |
| PsycINFO | Mobile Resources | Interlibrary Loan | Rush Archives |
| PubMed | Nursing Reference Center | ILLiad Login | Rush Email |
| Scopus | RefWorks | Library Account Registration/Update | Rush University |
| UpToDate | VisualDx | Renew Books and Media | |
| All Databases... | Copyright Resources New | Schedule an Appointment | |



©opyright in the Classroom

Jennifer Westrick, MSLIS

Reference Librarian

Heather Kartsounes, JD

Legal Affairs

Rush University Medical Center
Teaching Academy Series
February 20, 2018

IT'S HOW MEDICINE SHOULD BE®

Copyright for Educators
Presented at the Rush University Teaching Academy Series
Feb 20, 2018

A guide for copyright resources is available on the library's website. This guide provides a quick look at copyright law as it exists now, provides links to resources and offers tips on compliance for educators.
<http://rushu.libguides.com/>



| Step | Rationale |
|---|---|
| Use links - not PDFs - to direct students to an article | Linking to the article ensures copyright compliance and enables usage tracking (both for Rush and for the publisher). As long as the article is linked from resources to which we subscribe, the students will be able to follow that link and immediately access the article needed. |
| Check Fair Use | Resources include Rush's copyright policy #OP-0365 and the Fair Use Evaluator tool. |
| Learn the Creative Commons licenses | This will allow you to correctly interpret Creative Commons copyright notices |
| Use Open Access articles with caution | Remember that Open Access doesn't mean "free of copyright restrictions." |
| Limit e-reserve materials to small excerpts | Most experts advise using a single article or chapter, or less, of a copyrighted work. |
| Get permission first | Secure copyright permissions prior to posting content. |
| Keep a paper trail | When in doubt, print it out. |
| Refresh your materials every semester | If you had to obtain permission to use an article, the permission granted probably applied to that one semester only. Make sure you take down (or remove access to) copyrighted e-reserve content for a particular class when the term concludes. |
| Include copyright notices | Materials on e-reserve should contain the copyright notice and a complete citation. |
| Check copyright on articles/books that you've written | You may not own copyright to articles you have written. Check the agreement you signed with the publisher. |

Recorded presentation available at <http://cmetracker.net/RUSH/Enduring>

Library of Rush University Medical Center
(312) 942-5950
lib_ref@rush.edu

Legal Affairs
(312) 942-6886

Rush University Medical Center's Copyright Compliance Policy Number OP-0365

Purpose

The Copyright Act protects the rights of copyright owners in their copyrighted works and governs reproduction of copyrighted works. The Copyright Act provides for reproduction of copyrighted works without permission, under limited circumstances, including if the intended use is considered a Fair Use under the Copyright Act. If an intended use does not qualify as a Fair Use, or is not otherwise expressly provided by the Copyright Act, permission must be sought to use such work.

This policy applies to any faculty member, staff member, employee or student of Rush University Medical Center ("Covered Individuals").

Definitions

Copyright Act: The United States Copyright Law of 1976, as amended (Title 17 of the United States Code).

Fair Use: The use of a copyrighted work for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research pursuant to the requirements of the Copyright Act.

Guidelines: A set of guidelines to be used for determining whether an intended use of a copyrighted work qualifies as a Fair Use or is otherwise expressly permitted under the Copyright Act. The Guidelines are attached to this policy as Attachment A.

Policy

Use of copyrighted works by Covered Individuals shall comply with the Copyright Act. Prior to use of another individual's or entity's copyrighted work, Covered Individuals shall make a determination whether their intended use is permitted under the Copyright Act as a Fair Use or otherwise expressly permitted under the Copyright Act. If a covered individual's intended use of a copyrighted work does not qualify as Fair use or is not otherwise expressly permitted by the Copyright Act, the covered Individual shall obtain permission from the copyright holder prior to use of the copyrighted work.

Responsibility and Procedure

Covered Individuals

1. Determine whether the intended use qualifies as Fair Use under the Copyright Act. The Guidelines provide the necessary steps to make this determination.
2. If the intended use does not qualify as Fair Use under the Copyright Act, determine if the intended use is otherwise expressly permitted by the Copyright Act. The Guidelines provide the necessary information to make this determination.
3. If the intended use does not qualify as Fair Use under the Copyright Act and is not otherwise expressly permitted under the Copyright Act, obtain permission from the copyright holder prior to use of the copyrighted work. The Guidelines provide the appropriate steps to request permission from a copyright holder to use a copyrighted work.

Attachments that can be found online:

AttchmtA Guidelines.doc: an 11 page document that explains the policy in greater detail

APPENDIX A.doc: a checklist that assists in determining fair use

APPENDIX B_Copyright Permission Ltr.doc: a sample letter asking for permission to use an item

<http://inside2.rush.edu/policies/Lists/Master%20Policy/By%20Policy%20Number.aspx> policy OP-0365

Contact: Samuel_A_Siegfried@rush.edu; Approval Date: 2/2/2016

Voice Care for Health-Care Providers



Inna Husain, MD

Assistant Professor

Director of the Voice, Airway,
Swallowing Disorders Program
Dept. of Otorhinolaryngology –
Head and Neck Surgery



Cynthia Hildner, MS CCC SLP

Speech-Language Pathologist

Outpatient Voice & Swallowing
Dept. Communicative Sciences &
Disorders – Speech Pathology

Disclosures

➤ None

Objectives

- Review the pathophysiology of voice production
- Examine why health-care providers are at risk for dysphonia
- Understand muscle tension dysphonia and its role in common voice complaints
- Explore the role of voice therapy with a practice session

Voice Production

➤ Power Source

- A column of air pressure is moved towards the vocal folds

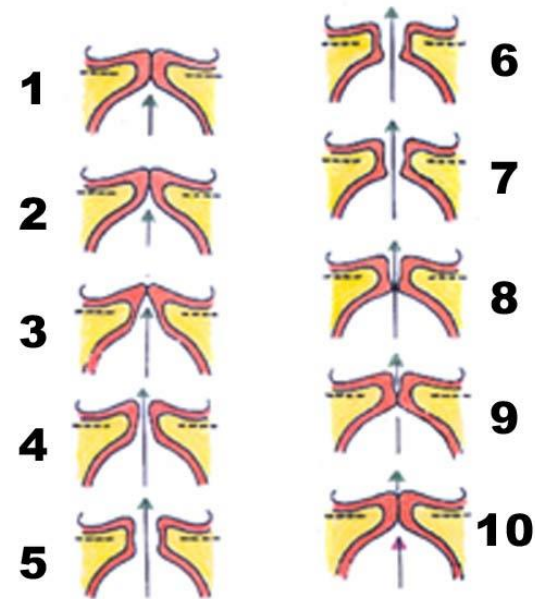
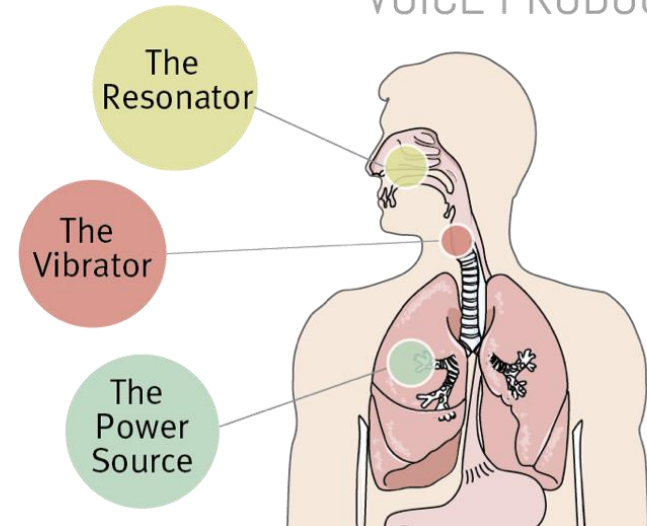
➤ Vocal fold vibration

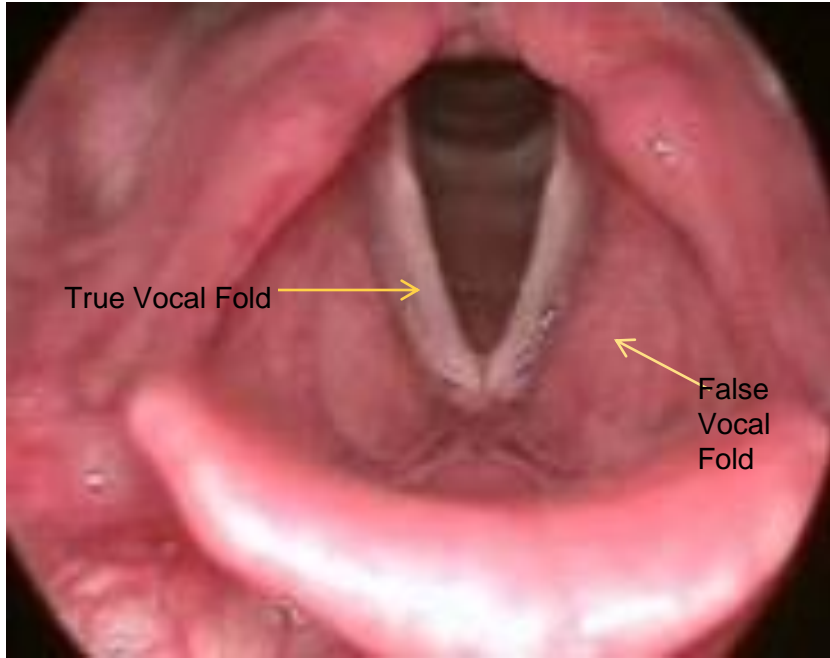
- Vocal folds are moved to midline by voice box muscles, nerves, and cartilages
- Repeat vibratory cycles create rapid pulses of air: “voiced sound”
- 110 cycles per second (men)
- 180 to 220 cycles per second (women)

➤ Vocal tract – resonators and articulators

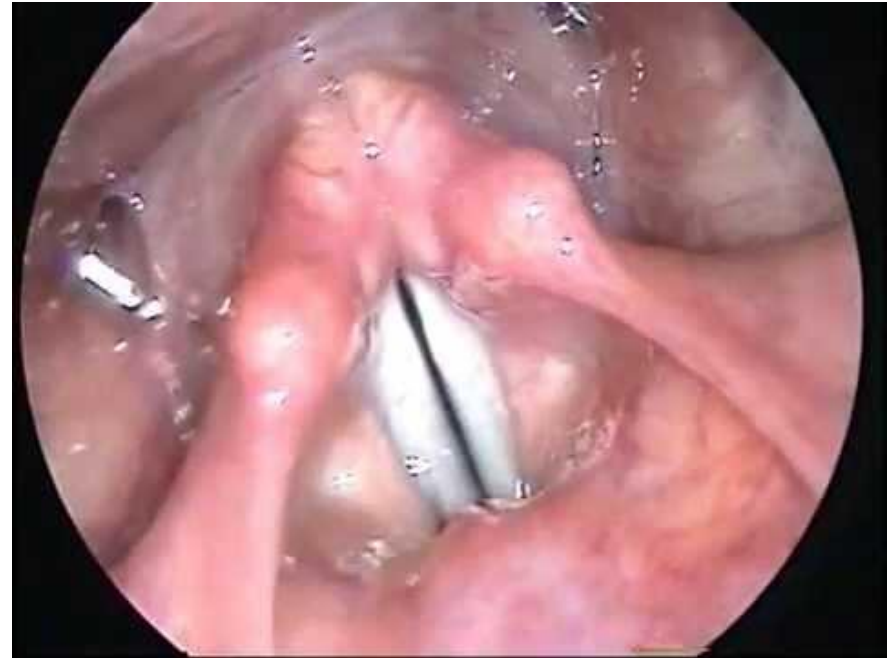
- The nose, pharynx, and mouth amplify and modify sound, allowing it to take on the distinctive qualities of voice

VOICE PRODUCTION





Inhalation



Phonation

Who are professional voice users?

- Those who depend on a consistent, special, or appealing voice quality as a primary tool of trade
- Those who, if afflicted with dysphonia or aphonia, would generally be discouraged in their jobs and seek alternative employment



Professional Voice Users

- Higher rates of vocal fold lesions than general population
- Exposed to increased phonotrauma
 - Heavy vocal loading + Inefficient voice use + Unhealthy vocal habits
 - Lack of knowledge regarding vocal behaviors
 - No formal training prior to entering the workforce



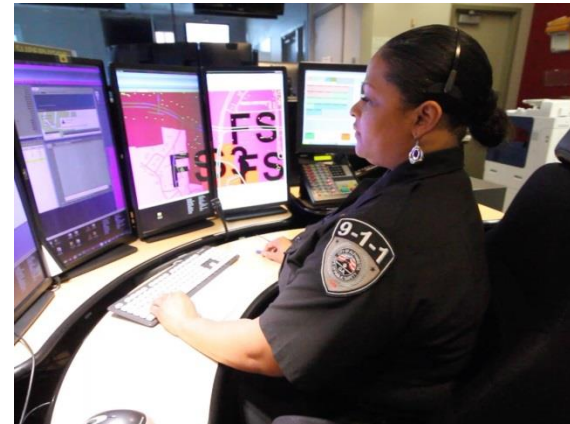
Professional Voice Users

- Increase rates of throat irritation, dysphonia, vocal fatigue, and throat pain
- Effects are cumulative and increase with time spent in one's profession
- Female professional voice users have more deviation from normal voice than male counterparts
 - 40% more vocal fold collisions per second than her male counterpart



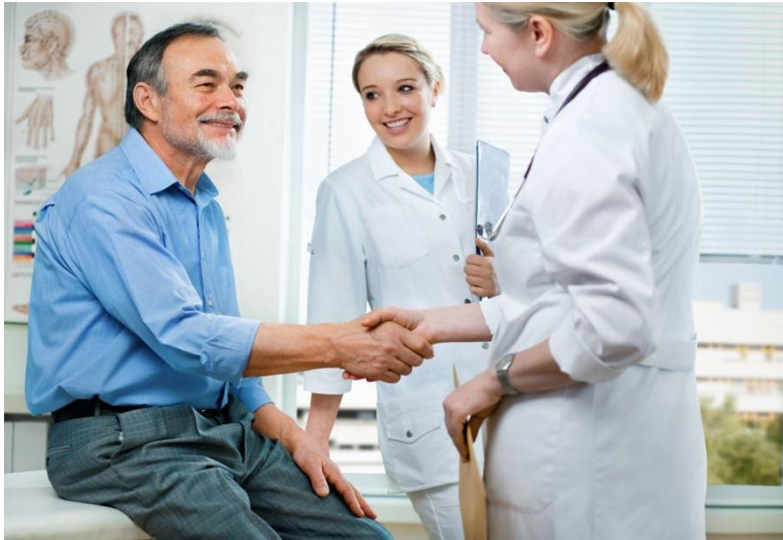
Voice Use in the Workplace

- 1/3 of all jobs worldwide depend on a worker using his or her voice as a primary tool
- Vocal problems can:
 - affect careers and career longevity
 - reduce profit for a company
 - jeopardize safety if there is miscommunication of key facts and directives

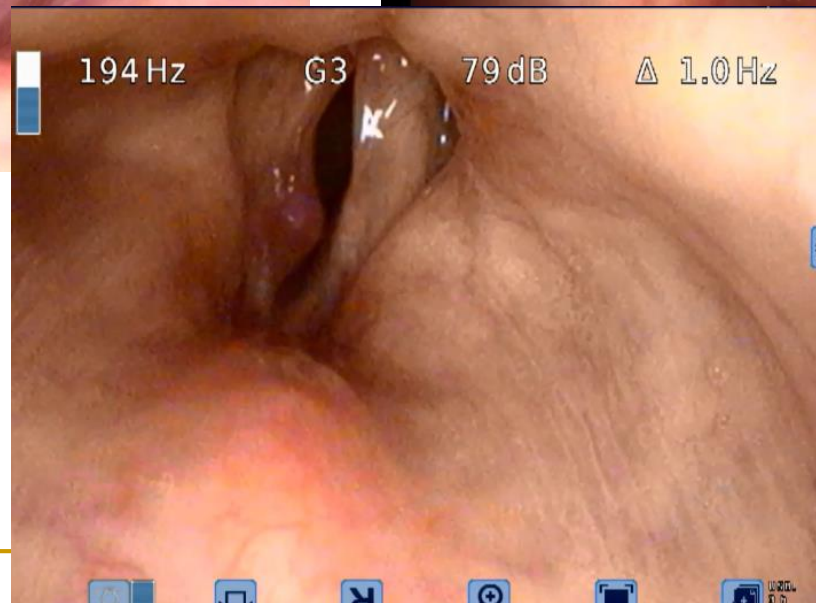
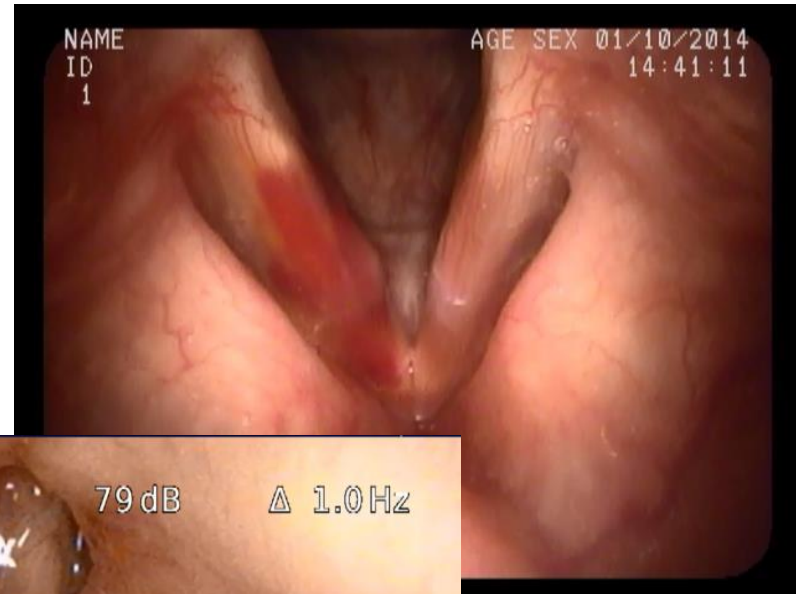
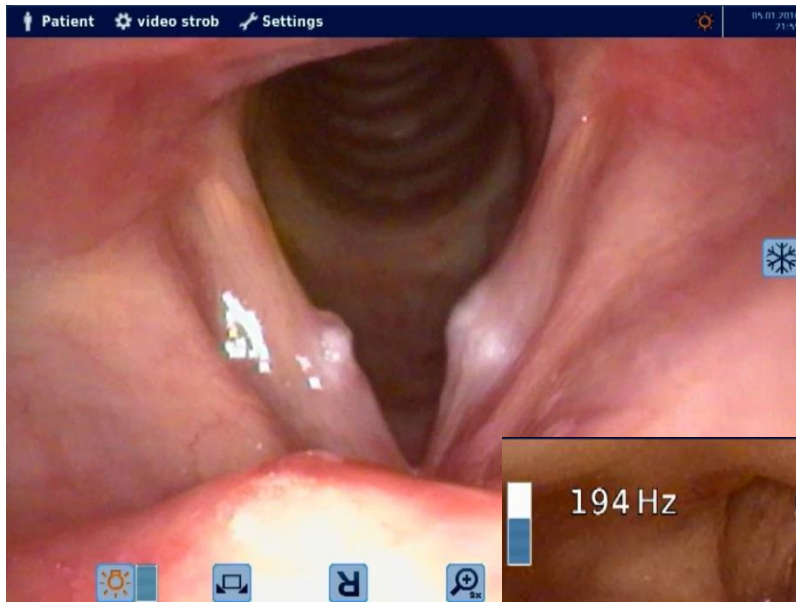


Vilkman E. Voice problems at work: a challenge for occupational safety and health arrangement. *Folia Phoniatr Logop.* 2000;52:120–125.

Health Care Providers and Voice Use



Phonotraumatic Vocal Cord Lesions



Voice Disorders – sample of the multiple types

- Presbylarynx (aging voice)
- Vocal tremors or spasmodic dysphonia
- Laryngeal Muscle Tension Dysphonia

What is a disordered voice?

- Abnormal voice, as judged by the listener, involving either pitch, quality, loudness, flexibility or combination of these.
 - quality: hoarse, harsh or breathy
 - pitch: too high, too low or monotone
 - loudness: too loud or too soft
 - flexibility: dull, lack of variability, breaks/cracks

Good vocal function

- CLOSURE
- “Just the right”
 - TENSION
 - MASS
- PLIABILITY



What is Muscle Tension Dysphonia

- Voice disorder without laryngeal pathology
 - imbalance of muscles in the larynx
 - muscle use with increased strain following swelling of the vocal folds from laryngitis
 - squeezing of the false vocal folds
- fMRI study revealed over-activation of nervous system including motor inhibition networks

Muscle Tension Dysphonia



What is Vocal Fatigue?

- Throat clearing
<https://www.youtube.com/watch?v=6Rn68PxJ2Ik>
- Dry mouth and throat
- Discomfort, pain in throat
- Feeling of weakness when speaking, especially at the end of the day
- Tension in shoulders, neck, throat
- Hoarseness

Speech-Language Pathologist: Voice treatment



- Evaluates the function & sound of the voice
 - Objective, quantitative measures of voice
 - Analyzes voice use and breathing for speech

- Provides behavioral treatment to teach
 - Proper care of the voice
 - Good breathing techniques for speaking
 - Efficient use of voice without strain



Principles of Voice Care and Improved Voice Production

- Vocal hygiene principles
 - Hydration and steam inhalation
 - Elimination of habit throat clearing
 - Behavioral Laryngeal Pharyngeal Reflux modifications
 - *reduction of acidic foods*
 - *elevation of torso during sleep*
 - Use of good vocal behaviors
 - *use of appropriate pitch when speaking and singing*
 - *reduced speaking over noise or calling from a distance*
 - *use of microphone for teaching*
 - *elimination of whispering*
 - *reduction of speaking during upper respiratory infections and control of allergies*

Education, carryover and compliance AND treatment

Voice Therapy Examples: vocal efficiency and reduction of hoarseness

➤ Changing vocal behaviors

- Laryngeal manual therapy – circumlaryngeal massage
- Resonant voice training
 - voice that vibrates in the front of the mouth
 - vocal fold lightly touching with increased resonance responsible for the increase in volume
- Semi-occluded vocal tract exercises (SOVT)
 - flow-resistant straws “straw phonation”
 - mouth is partially closed at the lips
 - allows for lengthening of the vocal tract
 - helps the vocal folds to vibrate with greater ease and less muscle strain

Titze, IR. 2006 Voice training and therapy with a semi-occluded vocal tract: Rationale and scientific underpinnings. *Journal of Speech, Language and Hearing Research*, 49, 448-459

Yiu, EM, Lo MC, Barrett, EA 2017 A systematic review of resonant voice therapy. *Int J Sp Lang Path*. 1, 17-29.

Example Treatment Techniques

➤ Resonant Voice

- motor learning model
- sensation of vibration in the lips, front of mouth or face
- goal clearest voice with least amount of effort
- practice in a variety of contexts

➤ Straw Phonation:

- put straw in your mouth
- make sound through the straw
- gentle “mmm” tone with little effort
- pitch glides from high to low and low to high
- humming simple tunes

What if I am having voice problems?

Appointments:

Inna Husain, MD

Dept Rush Otorhinolaryngology Head &
Neck Surgery

312-942-6100

Cynthia Hildner, MS CCC-SLP

Speech-Language Pathology

312-942-5332

Thanks!



Questions?

Identifying our Biases to Create a Better University

Angela L Davis
Learning Consultant



RUSH
LEADERSHIP
and LEARNING
ACADEMY

IT'S HOW MEDICINE SHOULD BE®

Objectives

- Identify some of our bias and where they come from
- Become aware of how our bias impact interactions with others
- Gain practical ways to effectively manage bias

Definitions

Bias

- Cause to feel or show inclination or prejudice for or against someone or something

Implicit Bias

- Refers to the attitudes or stereotypes that affect our understanding, actions, and decisions in an unconscious manner

What are your assumptions . . . ?

- Walmart/Neiman Marcus
- Tattoos, Piercing, Stretching
- Democrats/Republicans
- Foreign/Domestic born
- South side/North side
- Heavy/Athletic build

Differences

Race

Ethnicity

Gender

Religion

Age

Language

Physical Ability

Marital Status

Social Class

Veteran Status

Nationality

Education

Mental Ability

Sexual Orientation

Geography

Political Affiliation

Physical Appearance

Children/No Children

Differences – Students

Learning Style

Study Habits

Personality Attributes

Education History

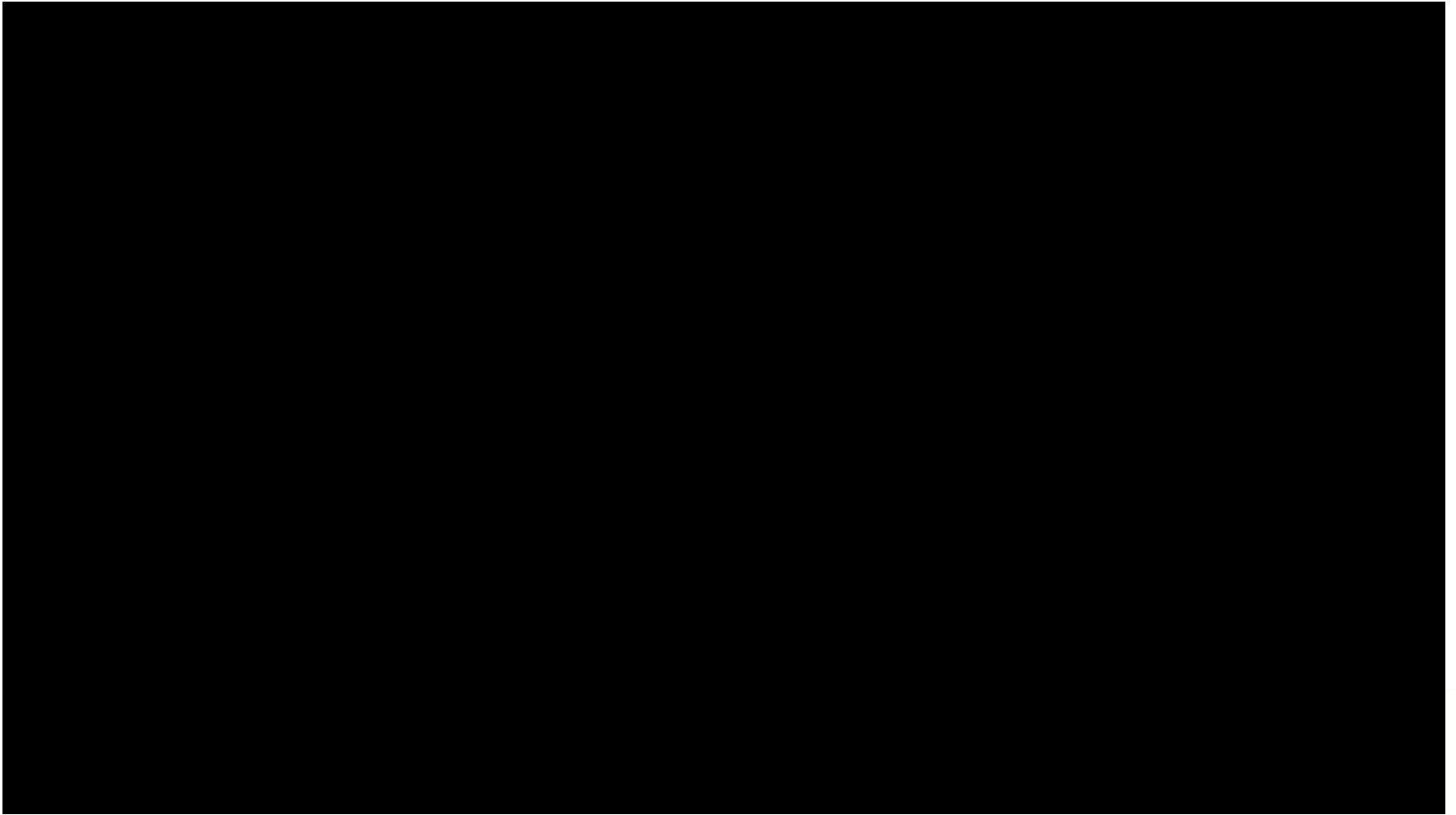
Learning Ability

Thinking Skills

Questions

- What stereotypes/assumptions do others have about you?
- What stereotypes/assumptions do you have about students?

Example



Impact of Bias - aka What's at Stake?

- Student recruitment
- Retention
- University Reputation
- Student Experience
- Achieving the strategic priorities of the university
- Your credibility

Bottom Line

We need to get comfortable with
being uncomfortable!

What do you hear?

Have students expressed any incidence of bias while learning at Rush?

Let's talk about it

Rush Example – What would you do?

A student raises a complaint based on an observation he made of the faculty member during a class discussion. It happened that the minority students sat together on one side of the classroom while the majority students sat together on the other side. The faculty member was observed to have his back to the minority students during most of the class.

What can you do?

- PAUSE!!!!
- Check your assumptions
- Lead with curiosity
- Listen
- Ask for feedback
- Consider your ‘end game’
- If you make a mistake, apologize

Additional Resources

- <https://implicit.harvard.edu/implicit/takeatest.html>
- **Everyday Bias** - *Identifying and Navigating Unconscious Judgments in Our Daily Lives* by Howard J Ross

Learner Management: Establishing Affective Expectations

Statement of Disclosure



Participants must attend the entire session in order to earn contact hour credit. Verification of participation will be noted by learner initial/signature on the roster.

Planners and presenters have declared the absence or presence of any real or perceived conflict of interest which might influence the planning of this activity.

No commercial support has influenced the planning of the educational objectives or the content of this activity.

If there were any commercial support provided for this activity, it would be used for events that are not related to continuing education.

There is no endorsement of any product by the provider or RUMC associated with this activity.

It is expected that no presentation will relate to products governed by the Food and Drug Administration. But, during the course of this activity, if there is discussion related to such products, FDA-approved and non-approved uses will be disclosed to participants.

- What is the affective domain?
- How do we develop desired affective characteristics in your students?
- How do we evaluate the affective domain?
- How do you establish effective and appropriate student relationships?
- How do you lead effective discussion?

- Developing professional and humanistic characteristics

Core Values → Beliefs → Attitudes → Behaviors

- Affective Domain
 - Receiving
 - Responding
 - Valuing
 - Organization
 - Characterization

Affective Domain Objectives

| Level or Category | Behavioral Objectives |
|---|---|
| <p>Receiving</p> <p>Awareness, willingness to hear, selected attention.</p> | <ol style="list-style-type: none"> 1. Listens attentively during class and takes lecture notes. 2. Demonstrates respect when others are expressing opinions, interpretation or viewpoints or providing clarification. 3. Demonstrates attention to selected portions of the lecture. |
| <p>Responding</p> <p>Active participation, reacts to particular phenomena, willing to respond, takes satisfaction in responding.</p> | <ol style="list-style-type: none"> 1. Participates in class discussion. 2. Questions new concepts to fully understand them. 3. Provides a more in-depth report or presentation on a concept. 4. Contributes to the learning atmosphere in the classroom. 5. Demonstrates satisfaction with contributions made during class. 6. Volunteers for special assignments or tasks. 7. Helps others understand concepts. |
| <p>Valuing</p> <p>Attaches worth to an object, concept or behavior ranging from simple acceptance to a state of commitment; clues to valuing are expressed in the learner's behavior.</p> | <ol style="list-style-type: none"> 1. Demonstrates problem-solving abilities. 2. Proposes a plan for improvement using newly learned information. 3. Expresses sensitivity toward individual and cultural differences. 4. Shares materials and information with others. 5. Encourages others to do well and helps with their problems. 6. Completes obligations in doing group work and assists those reluctant to participate in group work. 7. Defends the application of newly learned concepts in the practical setting. |

Organization

Accepts newly learned information and organizes it to fit the current value system; sometimes information conflicts with previous values, requiring modification of one's value system.

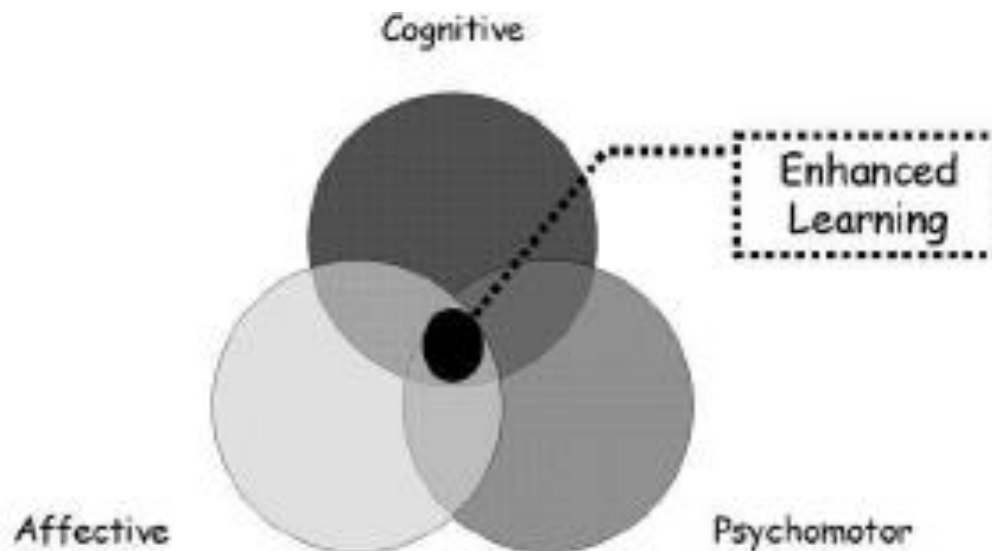
1. Accepts responsibility for one's behavior.
2. Accepts professional ethical standards.
3. States personal position reflecting a balance between the needs of the patient and the needs of the facility.
4. Establishes a philosophy regarding patient care, performance and behaviors.
5. Prioritizes time and tasks effectively to maximize efficiency.
6. Demonstrates a progressively growing state of self-confidence.
7. Formulates and commits to long-range career goals.

Characterization

Internalizes values; value system controls behavior; behavior is predictable, consistent and pervasive; individual's behavior reflects values over a long period of time and become a characteristic lifestyle.

1. Seeks objectivity in interpreting events and problem solving.
2. Changes opinions when evidence is contrary to beliefs.
3. Suspends judgment when evidence is inadequate.
4. Bases ideas and opinions on best evidence available and on scientific studies.
5. Demonstrates self-reliance when working independently.
6. Displays a professional commitment to ethical practice on a daily basis.
7. Values people for who they are and not on how they look or their social position.
8. Conducts oneself according to professional ethics and patient needs.
9. Emanates professionalism and self-confidence.

| <i>Learning Domains</i> | <i>Learning Models</i> | |
|---------------------------------|----------------------------|-----------------------------|
| | Kolb | Shulman |
| Affective | Concrete Experience | Engagement and Motivation |
| Cognitive | | Knowledge and Understanding |
| Psychomotor | | Performance and Action |
| Affective | Reflective Observation | Reflection and Critique |
| Cognitive | Abstract Conceptualization | Judgment and Design |
| Affective-Cognitive-Psychomotor | Active Experimentation | Commitment and Identity |



Learning Domains

Learning Objective: To screen older adults in the community for risks for falls

| | Learning Model | Teaching Strategy |
|-------------------------------------|-----------------------------|--|
| Affective | Engagement and Motivation | Lecture |
| Cognitive | Knowledge and Understanding | Laboratory with classmates |
| Psychomotor | Performance and Action | Balance clinic in the community: uncertainty and unpredictability |
| Affective | Reflection and Critique | Learning experience Knowledge and performance Values and beliefs |
| Cognitive | Judgment and Design | Meaning of the experience Perspective |
| Affective–Cognitive– Psychomotor | Commitment and Identity | Clinical judgment |

- Challenges of clinical teaching
 - Lack of clear objectives or expectations
 - Taught at the wrong level – Novice or Expert
 - Focuses on recall of facts ---- more problem solving
 - Lack of participation
 - Inadequate direct observations
 - No time for feedback
 - Insufficient time for reflection and discussion
 - Lack of incentives and awards for teaching
 - Patient related challenges

- Stanford Model --- 7 key categories
 - Promoting a positive learning environment
 - Control of sessions
 - Communication of goals
 - Promoting understanding and retention
 - Evaluation
 - Feedback
 - Promoting self-directed learning

- How do we develop desired affective characteristics in your students?

- Formal and Hidden Curriculum
 - Stop- “Do as I say, not as I do.”
 - Create an accepting, nonjudgmental classroom
 - Be active in professional organizations
 - Be objective and fair
 - Role model the values you want
 - Provide constructive feedback
 - Stress a cooperative rather than competitive learning environment

- Stress intrinsic rewards
 - Recognize best practices
- Role playing
- Create awareness of professional organizations
- Emphasize patient needs and concerns throughout the program
 - Discuss ethical dilemmas
- Use small groups to address issues
- Journaling student experiences

- Encourage different views of a situation
 - Discuss case studies
 - Identify problems discuss solutions
- Incorporate volunteerism into course requirements
- Create learning contracts outlining desired results
- Add a value component to each syllabus
 - See handout

- How do we evaluate the affective domain?
 - Self-Assessment
 - Rubrics
 - Clinical preceptor
 - Employer evaluation

Factors That Contribute to Generic Inabilities

1. Silence

- Do academic faculty fail to provide timely feedback to students who exhibit unprofessional behaviors?
- Are inappropriate behaviors ignored, such as tardiness, absenteeism, instant messaging, internet surfing, and/or inappropriate attire?

2. Misunderstanding of Motivations

- Is consideration given to understanding a student's behavior before passing judgment? Is there some information that may be missing?
- Is the problem a difference in learning styles? Is it lack of adequate preparation?
- Is the behavior harmful, outside the standards of the profession, or simply different?
- Does the presence of the behavior warrant an immediate response or a response at a more appropriate time?

3. Academic and Clinical Education Disparity

a) Practice culture that does not support teaching

- Is the CI committed to creating student/patient learning experiences?
- Is learning in the practice setting structured so that it is meaningful; simple to complex, concrete to abstract, normal to abnormal?
- Does the CI explicitly cultivate a healthy learning environment by intentionally linking the student's knowledge and background to the pathological effects of disease, illness, and injury on human function including psychosocial aspects?
- Have increased productivity demands and lack of opportunity for advancement (clinical ladders) resulted in a decreased motivation to serve as a CI?
- Is there a low expectation for advancing practice and expertise such that there is little encouragement or support of the student's desire for critical inquiry and the requirement for use of evidence in their decision making?
- Are students perceived and treated as "unpaid workers"?

3. Academic and Clinical Education Disparity

b) Sub-optimal educational partnership

- Has the DCE met or been in direct contact with the clinical manager and the CCCE to determine their level of commitment to having learners in their practice setting?
- Is the rigor and pace of the practice experience compatible with the student's level of preparation (simple vs complex patients, patient volume, pace of the learning experience)?
- Is there an expectation that a partnering relationship will be created and nurtured through sequential student placements versus a "1-time" rotation?
- Does the clinical education partnership add to the practice or is the responsibility for teaching interns perceived as an "add on?"

4. Anti–Role Modeling Behaviors

a) Clinical Faculty

- Is the CI unprepared to teach, not aware of student’s level of preparation or the school’s curricular plan (objectives) for the clinical experience?
- Is the CI disinterested in practice, lacking a commitment to lifelong learning, showing poor work ethics?
- Does the CI fail to directly observe student’s performance or provide timely feedback to students?
- Are therapists or medical providers in the practice and the CI positive role models?
- Does the CI value the role of clinical instructor and do others value it?

b) Academic Faculty

- Is the faculty out of touch with the demands and realities of practice?
- Do faculty exhibit inappropriate behaviors and have poor work ethics?

4. Anti–Role Modeling Behaviors

c) Lack of professionalism

- Are clinical and academic faculty members of their professional association(s)?
- Is there awareness of the regulatory constraints affecting the delivery of care including the cost of the physical therapy services delivered?
- Is value placed upon demonstrating continued competence and use of evidence in clinical decision making?
- Is there an awareness of and commitment to professional responsibilities beyond that of practice?

- How do we evaluate the affective domain?
 - Rubrics- article handout
 - Affective expectations in the classroom

- How do we evaluate the affective domain?
 - Clinical preceptor
 - Employer evaluation

III. BEHAVIORAL SKILLS (Affective Domain)

THE GRADUATE:

| | | | | | |
|--|-------------------------|-------------------------|-------------------------|------------------------------------|-------------------------|
| A. Has effective oral communication skills. | <input type="radio"/> 5 | <input type="radio"/> 4 | <input type="radio"/> 3 | <input checked="" type="radio"/> 2 | <input type="radio"/> 1 |
| B. Has effective written communication skills. | <input type="radio"/> 5 | <input type="radio"/> 4 | <input type="radio"/> 3 | <input checked="" type="radio"/> 2 | <input type="radio"/> 1 |
| C. Behaves in an ethical and professional manner. | <input type="radio"/> 5 | <input type="radio"/> 4 | <input type="radio"/> 3 | <input checked="" type="radio"/> 2 | <input type="radio"/> 1 |
| D. Functions effectively as a member of the healthcare team. | <input type="radio"/> 5 | <input type="radio"/> 4 | <input type="radio"/> 3 | <input checked="" type="radio"/> 2 | <input type="radio"/> 1 |
| E. Accepts supervision and works effectively with supervisory personnel. | <input type="radio"/> 5 | <input type="radio"/> 4 | <input type="radio"/> 3 | <input checked="" type="radio"/> 2 | <input type="radio"/> 1 |
| F. Is self-directed and responsible for his/her own actions. | <input type="radio"/> 5 | <input type="radio"/> 4 | <input type="radio"/> 3 | <input checked="" type="radio"/> 2 | <input type="radio"/> 1 |
| G. Arrives to work prepared and on time. | <input type="radio"/> 5 | <input type="radio"/> 4 | <input type="radio"/> 3 | <input checked="" type="radio"/> 2 | <input type="radio"/> 1 |
| H. Contributes to a positive environment in the department. | <input type="radio"/> 5 | <input type="radio"/> 4 | <input type="radio"/> 3 | <input checked="" type="radio"/> 2 | <input type="radio"/> 1 |
| I. Displays respect for beliefs and values of all persons regardless of cultural background, religion, age or lifestyle. | <input type="radio"/> 5 | <input type="radio"/> 4 | <input type="radio"/> 3 | <input checked="" type="radio"/> 2 | <input type="radio"/> 1 |

Comments:

- How do you establish effective and appropriate student relationships?

Expectations for the Teacher-Learner Relationship

Rush Medical College has a long-standing tradition of valuing and creating a productive and positive learning environment for its students – this environment is an institutional asset that is vital to carrying out our missions in teaching, patient care, and research. The relationship between teachers and learners should be based on mutual trust, respect, and responsibility. The expectations for maintaining a professional teacher-learner relationship are relevant to all faculty, residents, staff, and students who participate in educational activities in the classroom, laboratory, research, or clinical settings where there is a focus on education, patient care, and ethical conduct.

Expectations for Learners

Students are expected to participate in the learning process in an active, respectful and professional manner. Students' motivation and actions should be appropriately directed at gaining the knowledge, skills, and values that are required to become a competent, ethical, and compassionate physician. This includes the following:

- Being adequately prepared for learning activities in the classroom, laboratory, research, and clinical settings,
- Treating faculty, residents, staff, and fellow students with respect and collegiality,
- Actively and appropriately seeking information to improve their own performance,
- Reflecting on their performance and educational experiences to inform their self-directed learning and study,
- Adhering to the tenets of the "University Statement on Student Conduct" and the "University Statement on Academic Honesty," as well as the student-authored "Student Honor Code," Resolving conflict in an appropriate and professional manner, and
- Providing constructive feedback and evaluation about their learning experiences.

Expectations for Teachers

Teachers are expected to participate in the learning process in an active, respectful and professional manner. Faculty, residents, and staff who work with students and residents are charged with helping these learners to become competent, ethical, and compassionate physicians. This includes the following:

- Being adequately prepared for learning activities in the classroom, laboratory, research, and clinical settings,
- Treating learners and fellow teachers with respect and collegiality,
- Providing learners with clear expectations for performance, and when applicable, a detailed, written outline of course objectives and expectations,
- Providing learners with ongoing, specific and constructive feedback about their performance, Reflecting on their teaching to inform their own self-directed learning and study,
- Actively participating in the development and improvement of courses and their content, Timely completion of fair and accurate evaluation of student performance,

- How do you lead effective discussion?
 - Videos from The Great Courses: The Art of Teaching: Best Practices from a Master Educator titled Engaging with Discussion, Part 1 and 2 by Patrick Allitt.
 - Read IDEA paper #49 - Effective Classroom Discussions.

- Engaging with Discussion by Dr. Allitt
 - Discussion allows students to practice thinking through of problems as well as organizing key concepts.
 - Praise students for their comments and accurate summaries.
 - If a student blunders, give them an early opportunity to restore their credibility.
 - Ask open-ended questions to stimulate discussion and leave time for students to think about answers.
 - Frame a new question to lead students to a different topic.

- Seminars are useful for close analysis of texts, and for getting students to think systematically about argumentation, vocabulary, rhetoric, and style.
- Seminars help students refine public speaking skills, precision with language, and ability to persuade one another.
- Create incentives and reward intelligent participation generously.
- Insist that students say what they “think” and can justify their thoughts.
- Be demanding but leaven your rigor with humor.

- Valkenburg JV, Holden LK. Teaching methods in the affective domain. *Radiologic Technology*. 2004;75(5):347-354.
- Goulet C, Owen-Smith P. Cognitive-affective learning in physical therapy education: From implicit to explicit. *Journal of Physical Therapy Education*. 2005;19(3):67-72.
- Ramani S, Leinster S. AMEE Guide no. 34: Teaching in the clinical environment. *Medical Teacher*. 2008;30: 347-364
- Wolff-Burke M, Ingram D, Lewis K, et al. Generic inabilities and the use of a decision-making rubric for addressing deficits in professional behavior. *Journal of Physical Therapy Education*. 2007;21(3):13-22.

Affective Domain in the Classroom - GUIDE TO PROFESSIONAL CONDUCT

Professionalism relates to the intellectual, ethical, behavioral and attitudinal attributes necessary to perform as a health care provider. The student will be expected to:

Attention

1. Demonstrate awareness of the importance of learning by asking pertinent questions, identifying areas of importance in clinical practice and reporting and recording those areas.
2. Disruptive behavior in class, lab and clinicals, such as talking or other activity interferes with effective teaching and learning and should be avoided.

Participation

1. Complete assigned work and prepare for class, laboratory, and clinical objectives prior to attending.
2. Participate in formal and informal discussions, answer questions, report on experiences, and volunteer for special tasks and research.
3. Initiate alteration in patient care techniques when appropriate via notification of instructors, nursing staff and physician.

Dependability and Appearance

1. Attend and be punctual and reliable in completing assignments with minimal instructor supervision.
2. Promote a professional demeanor by appropriate hygiene, grooming and attire.

Communication

1. Demonstrate a pleasant and positive attitude when dealing with patients and co-workers by greeting them by name, approaching them in a nonthreatening manner, and setting them at ease.
2. Explain procedures clearly to the patient.
3. Ask patients how they feel and solicit patient comments regarding the patient's overall condition and response to therapy.
4. Communicate clearly to nursing staff and physicians regarding the patient status, utilizing appropriate charting, oral communication and the established chain of command.
5. Demonstrate a pleasant and positive attitude when dealing with co-workers, instructors, faculty, nurses and physicians.

Organization

1. Display recognition of the importance of interpersonal relationships with students, faculty, and other members of the health care team by acting in a cordial and pleasant manner.
2. Work as a team with fellow students, instructors, nursing staff and the physician in providing patient care.
3. Organize work assignments effectively.
4. Collect information from appropriate resources.
5. Correlate respiratory care to overall patient condition.
6. Adapt respiratory care techniques to overcome difficulties.
7. Devise or suggest new techniques welfare or patient or unit efficiency.

Safety

1. Verify identity of patients before initiating therapeutic action.
2. Interpret written information and verbal directions correctly.
3. Observe and report significant changes in patient's condition promptly to appropriate person(s).
4. Act to prevent accidents and injury to patients, personnel and self.
5. Transfer previously learned theory and skills to new/different patient situations.
6. Request help from faculty/staff when unsure.
7. Comply with hospital and university guidelines for performance.

Examples of critical errors in professional conduct and judgment include:

1. Failure to place the patient's welfare as first priority.
2. Failure to maintain physical, mental, and emotional composure in all situations.
3. Consistent ineffective, inefficient use of time in clinical setting.
4. Failure to be honest with patients, faculty, and colleagues.
5. Scholastic dishonesty in any form.

Generic Inabilities and the Use of a Decision-Making Rubric for Addressing Deficits in Professional Behavior

Melissa Wolff-Burke, PT, EdD, ATC, Debbie Ingram, PT, EdD, Kathy Lewis, PT, JD, Corrie Odom, PT, DPT, ATC, and Lisa Donegan Shoaf, PT, PhD

Background and Purpose. The difficulty of identification, remediation, and evaluation of inappropriate behaviors remains a challenge for academic and clinical faculty who are hesitant to address deficits in the affective domain. Because inappropriate behavior can potentially affect patient care and outcomes, academic and clinical faculty must be able to identify and respond to these “Generic Inabilities.” The purpose of this article is to identify factors that foster Generic Inabilities and provide guidance to clinical and academic faculty on their fiduciary responsibilities and courses of action.

Position and Rationale. The physical therapy profession has developed a variety of documents that describe physical therapists’ responsibilities and obligations to professionalism; these can be considered a “Physical Therapy Code of Conduct.” An examination of behaviors that are

Melissa Wolff-Burke is an associate professor and director of clinical education, Shenandoah University, Division of Physical Therapy, 333 West Cork Street, Suite 40, Winchester, VA 22601 (mwolff@su.edu). Please address all correspondence to Melissa Wolff-Burke.

Debbie Ingram is a professor and director of clinical education, University of Tennessee at Chattanooga, Department of Physical Therapy, 615 McCallie Avenue, Chattanooga, TN 37403.

Kathy Lewis is an associate professor at Wichita State University, Physical Therapy department, 813 Woodridge Drive, Wichita, KS 67206.

Corrie Odom is an assistant professor and academic coordinator of clinical education at Duke University, Doctor of Physical Therapy Division, 2200 West Main Street, Erwin Square, Suite A-210, DUMC Box 104002, Durham, NC 27705.

Lisa Donegan Shoaf is an assistant professor and director of clinical education at Virginia Commonwealth University, Medical College of Virginia, Department of Physical Therapy, Station Box 980224, Richmond, VA 23298.

Received August 18, 2006, and accepted July 24, 2007.

contrary to expected conduct, termed “Generic Inabilities,” can open the conversation regarding generally unacceptable behaviors and may assist academic and clinical faculty to address unprofessional and negative behaviors when observed. Factors that contribute to the development or continuance of Generic Inabilities are silence, a misunderstanding of motivations, academic and clinical education disparities, and anti-role modeling. Numerous laws, policies, and procedures seek to protect the public from unscrupulous, incompetent, and unethical practitioners. Therefore, clinical and academic faculties have a legal and ethical responsibility to act in the face of inappropriate behaviors.

Recommendations. A decision-making rubric is proposed for addressing Generic Inabilities. It includes detailed fact-finding, a consideration of the ethical principles, an assessment of the expected professional duties, an analysis of the desired outcomes, implementation of action(s), and re-assessment as needed. The adapted decision-making rubric for addressing behavioral issues takes the practitioner through a series of 7 questions that lead to implementation of a specific action.

Key Words: Generic Abilities, Generic Inabilities, Professionalism, Unprofessional behaviors, Decision making.

BACKGROUND AND PURPOSE

Professionalism is not a spectator sport.

Stefan Schulz¹

Although the physical therapy-specific Generic Abilities² have been validated,³ expanded,⁴ and used in the profession for 10 years, the difficulty of identification, remediation, and evaluation of inappropriate behaviors, or “Generic Inabilities”⁵ remains a challenge for academic and clinical faculty. Evidence indicates that clinical instructors (CIs) are able to recognize and address cognitive deficits^{6,7,8,9} but are less likely to address and remediate deficits in the affective domain.^{10,11,12,13} “Professional growth involves changes in our knowledge, our skills

and our attitudes, values and beliefs”^{14(p33)} and inappropriate behavior can potentially affect patient care and outcomes. Therefore, academic and clinical faculty must be able to identify and respond to these Generic Inabilities. For the purposes of this article, Generic Inabilities refer to behaviors in any domain of learning (cognitive, psychomotor, and/or affective) that are perceived to be the antithesis of expected professional behaviors. The purpose of this article is to identify factors that foster Generic Inabilities and to provide guidance to clinical and academic faculty on their fiduciary responsibilities and courses of action.

POSITION AND RATIONALE

A Physical Therapy Code of Conduct

The physical therapy profession has developed documents that describe and guide the professional development of physical therapists and can be considered a physical therapy *code of conduct*. Similar in concept to the code of conduct of the armed forces that “outlines the basic responsibility and obligation of all US service members,”¹⁵ this collection of documents describes physical therapists’ responsibilities and obligations to professionalism. The documents include those used primarily in the academic setting (eg, *Evaluative Criteria for Accreditation of Education Programs for the Preparation of Physical Therapists*¹⁶; *A Normative Model of Physical Therapist Professional Education: Version 2004*¹⁷; *Vision 2020’s Strategic Plan for Transitioning to a Doctoring Profession (RC-01)*²²; *Minimum Required Skills of Physical Therapist Graduates at Entry-Level*²⁸) and those used in the academic and clinical setting (eg, *Professionalism in Physical Therapy: Core Values*²¹; *the Model for Ability-Based Assessment in Physical Therapy Education*²; *the Physical Therapist Clinical Performance Instrument*²⁹; *Code of Ethics*¹⁶; *Guide for Professional Conduct*¹⁷; *the Guide for Professional Conduct of the Physical Therapist Assistant*¹⁸; *Clinical Instructor Education and Credentialing Program*²⁴). Collectively, these documents provide a comprehensive picture of expected professional behaviors.

Professional Standards and Recommendations

American Physical Therapy Association's (APTA) *Code of Ethics*¹⁶ defines the accepted principles of professional conduct of the physical therapist in 11 areas: respecting rights and dignity; acting trustworthy; complying with laws; exercising sound judgment; maintaining competence; promoting high standards; seeking reasonable compensation; sharing accurate information; public protection; addressing public health needs; and demonstrating respect of others working in health care. APTA's *Guide for Professional Conduct*¹⁷ provides additional interpretation of these 11 principles. Similarly, guidance is given for expected practice and behavior of the physical therapist assistant (PTA) in *Standards of Ethical Conduct for the Physical Therapist Assistant*¹⁸ and *Guide for Conduct of the Physical Therapist Assistant*.¹⁹ The PTA documents include 7 standards: respecting rights and dignity; acting trustworthy; practicing with supervision; complying with laws; maintaining competence; making judgments consistent with education; and protecting the public. Some state practice acts specifically refer to the APTA's *Code of Ethics*¹⁶ and *Guide for Professional Conduct*¹⁷ in defining the accepted behavior for licensees.²⁰ *Professionalism in Physical Therapy: Core Values*²¹ was developed as a result of the Vision 2020 *Strategic Plan for Transitioning to a Doctoring Profession*.²² Through a consensus-based conference, expert physical therapists were asked to determine "what the graduate of a physical therapist program ought to demonstrate with respect to professionalism."²² The participants identified and defined Core Values of accountability, altruism, compassion/caring, excellence, integrity, professional duty, and social responsibility. A companion *Core Values: Self-Assessment*²³ document encourages physical therapists to reflect on their own application of the Core Values using a frequency rating scale.

To improve their ability to identify and evaluate the cognitive, affective, and psychomotor abilities of students, CIs are encouraged to participate in APTA's *Clinical Instructor Education and Credentialing Program*.²⁴ Assessment of these behaviors may be improved by training,²⁵ and CIs who gain skills in assessment may be better equipped to meet the challenges of remediation for students who demonstrate unprofessional behaviors.

Academic Standards

The vision of doctorally-prepared, direct access, autonomous providers is emphasized in guiding documents of the profession and academic programs. Vision 2020²² is the strategic vision of the physical therapy profession and embodies the principles of professionalism. With academic programs expected to play a major role in teaching and assessing professional behaviors, evidence of instruction and outcomes related to professionalism is required in *Evaluative Criteria for Accreditation of Education Programs for the Preparation of Physical Therapists*.²⁶ For example, students are expected to develop culturally appropriate communication skills. *A Normative Model of Physical Therapist Professional Education: Version 2004*²⁷ includes the Core Values as one of the professional practice expectations to be addressed in the curriculum. For example, to highlight the Core Value of social responsibility, students participate in community service activities supervised by the faculty. To further address the Vision 2020 Strategic Plan,²² another consensus conference was held to determine the *Minimum Required Skills of Physical Therapist Graduates at Entry-Level*.²⁸ Demonstration of the Core Values was included as a foundational or minimum skill.

During professional education, physical therapist students participate in clinical experiences. The *Physical Therapist Clinical Performance Instrument (CPI)*²⁹ is the clinical assessment tool utilized by the majority

of physical therapist education programs³⁰ for full-time clinical experiences. Sample behaviors and performance expectations (eg, quality of care, supervision/guidance required, consistency of performance, complexity of task/environment, efficiency of performance) provide guidance to accurately identify the student's level of performance. This evaluation tool is being revised and will include an assessment of APTA's Core Values.

Generic Inabilities

Various authors have described a mismatch in expectations for professionalism and active learning,⁷ aggressive confrontation with faculty,³¹ and poor communication and unprofessional behavior.⁶ Similar findings of inappropriate behaviors and descriptions of those behaviors, such as poor communication, behaving unprofessionally, demonstrating a lack of interest, and having an "attitude" led to use of the term *Generic Inabilities*⁵ and a list that provided specific descriptors of the unprofessional behaviors. By associating the terminology for unacceptable behavior with the more familiar terminology of the physical therapy-specific Generic Abilities, the author suggested that academic faculty and students could begin a dialogue and examination of these behaviors. Opening the conversation regarding generally unacceptable behaviors might allow academic and clinical faculty to feel more confident when addressing unprofessional and negative behaviors⁵ (Table 1). Medical school educators have also identified appropriate and inappropriate behaviors of medical students, supporting the premise that this problem crosses disciplines^{32,33,34,35,36} (Table 2).

Factors That Contribute to the Development or Continuance of Generic Inabilities

While the educational and training environments have changed substantially in recent years, physical therapist educators continue

Table 1. Descriptors of "Generic Inabilities" or Unprofessional Behavior in Physical Therapist Students

| Hays, 1999 | Hayward, 1999 | Carey and Ness, 2001 | Wolff-Burke, 2005 |
|--|--|--|---|
| <ul style="list-style-type: none"> • Poor communication: inappropriate nonverbal behavior, inappropriate interactions with patients and colleagues, inappropriate response to feedback • Unprofessional behavior: poor stress management, poor work, failure to accept responsibility, poor commitment to learning, failure to recognize limit, poor common sense, inappropriate personal behavior | <ul style="list-style-type: none"> • Arriving late • Taking off unscheduled time, thereby leaving patients without care • Noncompliance with dress code • Inappropriate provider-patient communication • Using vulgar language • Insubordination | <ul style="list-style-type: none"> • Confrontation over examination points, attendance policy, selection of clinical sites • Using profane language • Encroaching upon personal space of faculty • Urging faculty to resign • Berating faculty in front of other students • Organizing a boycott of a particular assignment • Hostile behaviors | <ul style="list-style-type: none"> • An attitude: arrogance, affiliation is a waste of time • Lack of interest: unprepared, lacks initiative • Poor communication: inappropriate language, gestures, conversations; not able to communicate needs • Being unprofessional: basic issues, immature, not taking responsibility |

Table 2. Descriptors of Unprofessional Behaviors in Medical Students

| Piper (from Wilhelm and Lapsey, 2001; Wilkerson, 2001), 2003 | Papadakis, 2004 | Hicks, 2005 | Teherani, 2005 |
|---|--|---|--|
| <ul style="list-style-type: none"> • Sexual harassment • Racial or ethnic slurs; intimidation and abusive language; degrading or demeaning comments; profanity or offensive language • Threatening or intimidating • Derogatory comments about quality of care • Inappropriate medical entries • Imposing idiosyncrasies on staff | <ul style="list-style-type: none"> • Unmet professional responsibility • Lack of effort toward self improvement and adaptability • Diminished relationships with patients and families • Diminished relationships with members of the health care team | <ul style="list-style-type: none"> • Dishonesty • Arrogance or disrespectfulness • Prejudice • Negative or abrasive interactions • Lack of accountability • Fiscal irresponsibility • Lack of commitment to lifelong learning • Lack of diligence • Personal excesses • Sexual misconduct | <ul style="list-style-type: none"> • Poor reliability/responsibility • Lack of self-improvement and adaptability • Poor initiative and motivation |

to rely heavily on clinical education experiences, part-time and full-time, for socializing students to this profession, “so it is pertinent to ask whether we are cultivating in current students and residents the professional behaviors we would seek should we need medical care.”³⁷ During professional education, intrinsic and extrinsic factors that are potential contributing factors to Generic Inabilities include a culture of silence, a misunderstanding of motivations, a weak relationship between the academic and clinical partners, and anti-role modeling behaviors. Hesitancy to assess performance in the affective domain and failure to confront persons who exhibit inappropriate or unacceptable behaviors contribute to the development and continuance of undesirable attributes and behaviors referred to as the following Generic Inabilities (Table 3):

1. Silence

In medical and physical therapist education programs, the silence surrounding evaluation of unprofessional behavior has been identified as a cause for concern.^{39,40} Practitioners and academic faculty have pointed to a myriad of reasons why they are reluctant to address unprofessional behavior in colleagues and students. Among these reasons are a displeasure for whistle-blowing, the idea that the behavior is someone else’s problem, the virtue of helping, financial pressures, large classes, time limitations, emphasis on technical knowledge and skills, lack of appropriate evaluation tools, lack of objectivity in evaluation, confidentiality concerns, lack of confidence in the accuracy of the observed behavior, damaged working relationships, possibility of retaliation, concerns about litigation and due process, ambiguous outcomes, and lack of support from the academic institution.^{5,39,41,42} Certainly, one’s own lack of confidence in how to take action when confronted with unprofessional behaviors cannot be overlooked. This silence may

be interpreted as a form of acceptance.

2. Misunderstanding of Motivations

Mindful conditions, not silence, must exist in the classroom and clinic if students are to develop the expected levels of professionalism. Simply identifying a behavior as inappropriate, without clarity on the motivation for the behavior, is inadequate, as “behaviors themselves may not in fact be obvious or transparent indications of ‘professionalism.’”⁴³ Yet judgments about an individual’s response that are observed as a behavior may rest with how the situation is interpreted.⁴⁴ Differences in values, generation, learning style, and locus of control will affect a student’s decisions prior to demonstrating a behavior. Adding to the confusion is the notion that what may be unprofessional behavior to one person is acceptable to another.⁴² However, a minimum standard must exist to which all can agree. Awareness of similarities and differences of motivations among students and faculty can serve to create an environment for success.

3. Academic and Clinical Education Disparity

The culture of the Academy. Academic faculty, as teachers of the profession, must facilitate students’ development of an identity that exemplifies the professional skills, principles, and values of a physical therapist. Faculty should assume first-line responsibility for holding students accountable for demonstrating desirable behaviors, and for modeling similar behaviors themselves.^{45,46,47} This should be an explicit process, one that is planned, structured, and routinely assessed by all faculty in order to promote professionalism.^{48,49,50} Although the previously mentioned documents of the profession explicitly describe expected behaviors, development of professionalism is not a simple task. Faculty with considerable experience have difficulty discussing and remedying behavioral

problems in students.^{48,51} Emphasis on traditional learning and teaching may neglect the broader aims of professional education curricula that include informing students of (and modeling) the expectations for professional behavior in the classroom and during clinical rotations. Like mindful practice, mindful teaching has great consequence on the academy’s product: Its graduates.⁵²

The culture of clinical education. Through clinical internship experiences, students are fully engaged with the practice environment, patients, and the professionals whom they aspire to become. In her recent article, Plack⁵³ discusses the essential role of experiential and situated learning to physical therapist practice. Clinical instructors and students reported that total immersion in the practice environment, not the classroom, enabled them to learn the culture and norms of the profession. Students reported that being made aware of the physical therapists’ day-to-day professional communication and interactions was critical to the development of a “professional identity.”

The center coordinator of clinical education (CCCE) must identify clinicians who will demonstrate the expected professional identity, be good role models, and teach by example, such that their practice behaviors exemplify the ideals of the profession.^{45,50,54} Clinical managers must allow CIs time during the workday to become familiar with the expectations of the academic program, to plan for the student’s arrival, to communicate with the students and academic program, and to teach and assess student performance.

Clinicians must recognize that, by accepting responsibility for a student, they are accepting a teaching position, a role and identity that require a greater commitment to the process than merely supervision. Today’s CI is faced with the challenge of delivering quality patient care and meeting productiv-

ity goals while providing optimal learning experiences for students.³⁸ Students will have frequent encounters with uncertainty and ambiguity, so close supervision to ensure patient safety⁴ and timely feedback by the CI is necessary to avoid promoting ineffective practice.⁶ Gandy⁵⁵ reported that, after fulfilling productivity requirements, completing

documentation, and administrative duties, CIs had approximately 36 minutes per day for teaching students. This creates a negative incentive for CIs when they are expected to maintain a consistent level of productivity without regard for their effort and responsibility during clinical teaching. CIs who are overburdened with productivity demands

and view the student as an unpaid, supervised employee, will not identify with their role as a teacher and a role model.

Suboptimal educational partnership. An under-recognized trend in health care classrooms and clinical education is that of evaluating knowledge over behaviors.^{36,39,56} In

Table 3. Factors That Contribute to Generic Inabilities: A Self-Assessment

1. Silence

- Do academic faculty fail to provide timely feedback to students who exhibit unprofessional behaviors?
- Are inappropriate behaviors ignored, such as tardiness, absenteeism, instant messaging, internet surfing, and/or inappropriate attire?

2. Misunderstanding of Motivations

- Is consideration given to understanding a student’s behavior before passing judgment? Is there some information that may be missing?
- Is the problem a difference in learning styles? Is it lack of adequate preparation?
- Is the behavior harmful, outside the standards of the profession, or simply different?
- Does the presence of the behavior warrant an immediate response or a response at a more appropriate time?

3. Academic and Clinical Education Disparity

a) Practice culture that does not support teaching

- Is the CI committed to creating student/patient learning experiences?
- Is learning in the practice setting structured so that it is meaningful; simple to complex, concrete to abstract, normal to abnormal?
- Does the CI explicitly cultivate a healthy learning environment by intentionally linking the student’s knowledge and background to the pathological effects of disease, illness, and injury on human function including psychosocial aspects?
- Have increased productivity demands and lack of opportunity for advancement (clinical ladders) resulted in a decreased motivation to serve as a CI?
- Is there a low expectation for advancing practice and expertise such that there is little encouragement or support of the student’s desire for critical inquiry and the requirement for use of evidence in their decision making?
- Are students perceived and treated as “unpaid workers”?

b) Sub-optimal educational partnership

- Has the DCE met or been in direct contact with the clinical manager and the CCCE to determine their level of commitment to having learners in their practice setting?
- Is the rigor and pace of the practice experience compatible with the student’s level of preparation (simple vs complex patients, patient volume, pace of the learning experience)?
- Is there an expectation that a partnering relationship will be created and nurtured through sequential student placements versus a “1-time” rotation?
- Does the clinical education partnership add to the practice or is the responsibility for teaching interns perceived as an “add on?”

4. Anti-Role Modeling Behaviors

a) Clinical Faculty

- Is the CI unprepared to teach, not aware of student’s level of preparation or the school’s curricular plan (objectives) for the clinical experience?
- Is the CI disinterested in practice, lacking a commitment to lifelong learning, showing poor work ethics?
- Does the CI fail to directly observe student’s performance or provide timely feedback to students?
- Are physical therapists in the practice and the CI positive role models?
- Does the CI value the role of clinical instructor and do others value it?

b) Academic Faculty

- Is the faculty out of touch with the demands and realities of practice?
- Do faculty exhibit inappropriate behaviors and have poor work ethics?

c) Lack of professionalism

- Are clinical and academic faculty members of their professional association(s)?
- Is there awareness of the regulatory constraints affecting the delivery of care including the cost of the physical therapy services delivered?
- Is value placed upon demonstrating continued competence and use of evidence in clinical decision making?
- Is there an awareness of and commitment to professional responsibilities beyond that of practice?

addition, CIs frequently have a greater level of personal comfort providing constructive criticism verbally rather than in writing.^{36,57} They face the temptation to “pass the buck,” leaving someone else to remediate the unprofessional behavior.^{36,58} These points serve as stark examples of partnership problems that contribute to the disconnect between the academic program goals, the clinical facility, and the professional standards. Without an explicit and concerted effort, a unified identity or ethos that reflects the physical therapy Core Values will remain elusive.

Clearly, the ultimate responsibility for assuring readiness for entry to the profession lies with the academic institution. However, accreditation standards explicitly define expectations for stronger relationships between professional programs and clinical faculty in an effort to assure competence in practice and teaching abilities.²⁶ The intent is to improve the learning experience by creating an educational environment that is uniform across the educational spectrum, embraces behavioral outcomes in all areas of practice, and is representative of a doctoring profession.

4. Anti-Role Modeling Behaviors

Faculty, both academic and clinical, who are not familiar with the core documents of their profession, who do not utilize evidence to support their decision making, who take little time to assess student performance and less time for reflecting on their own practice are anti-role models and should not be entrusted with teaching students. Poor teaching and student reasoning fatigue is fertile ground for the development of undesirable behaviors and suboptimal practice.⁵⁹ Academic and clinical faculty who are in the role unwillingly or are unprepared will be ineffective teachers of the profession and are less likely to expend the effort to correct behavior problems when they arise. Those who give little attention to their responsibilities as role models will miss opportunities to socialize learners to the ideology of a doctoring profession, a process that transcends lecturing.

When teaching students our Core Values, we must consider the real world in which they will work and relax. The concept of “teaching” must include not only lectures in the classroom, small group discussions, exercises in the laboratory, and care for patients in clinic but also conversations held in the hallway, jokes told in the cafeteria, and stories exchanged about a “great case” on our way to the parking lot.”³⁷

Participants in one study described how clini-

cians acted as role models, helping “develop a sense of belonging and a sense of becoming physical therapists.”⁵³ Being a good role model requires a willingness to abide by a behavioral code that best represents the collective profession. Clinical instructors and academic faculty who are good role models should, for example, value the role and responsibility of teaching, be members of APTA, communicate appropriately, possess good interpersonal skills, utilize the *Guide to Physical Therapist Practice*⁶⁰ in practice, consistently seek new evidence to assist in clinical decision making, seek to collaborate with others in contributing to evidence in practice, have a thorough understanding of reimbursement practices, and actively contribute to initiatives in their professional and public communities.

Legal Implications of Generic Inabilities

Clinical affiliation agreements, policies and procedures of clinical sites and universities, practice acts, case law, and jurisprudence research are additional resources for guides to action related to professional behavior. Each of these has a common premise: Protecting the public from unscrupulous, incompetent, and unethical practitioners is a legal responsibility.

Clinical affiliation agreements are more than a mere arrangement for students to work with patients at selected sites. Legal counsel of the university and clinical sites have vested interests in protecting the public while students are given the privilege of fine-tuning their clinical skills. When a concern arises, it behooves the CI and the academic coordinator of clinical education (ACCE) or director of clinical education (DCE) to review terms of the clinical affiliation agreement for guidance on a course of action. (Throughout the remainder of this article, DCE is synonymous with ACCE.) For example, a common clause in these agreements might state, “The University upon request of the facility may withdraw any student from the facility when his/her work, conduct or health may be deemed detrimental to patients or clients.” Accordingly, the CI is obligated to make this request when conditions suggest that the work, conduct, or health of the student may be detrimental, and the DCE is then contractually obligated to remove the student. To determine whether a particular situation is detrimental, the DCE may need to refer to policies and procedures of the clinical site as well as standards of care. Failure to act and failure to document actions can result in a liability disaster if a patient or client institutes legal action. As a deterrent and to emphasize

that clinical rotations are privileges rather than absolute rights, reviewing selected clinical affiliation agreement clauses with students prior to their attending clinical rotations is recommended. Requiring students to sign a statement that they agree to abide by the clinical affiliation agreement and the policies and procedures of their assigned clinical site, and making the obligations of both parties explicit may provide a strong deterrent. Most, if not all, clinical facilities have met accreditation standards that include policies and procedures to avoid and manage detrimental situations. These documents can be valuable guides for the CI and DCE, even when a problem is not well defined.

The standard of care includes professional conduct as evidenced by practice acts and case law.^{61,62,63,64} Licensing boards spend a vast majority of time dealing with conduct issues, ie, sex, lies, and drugs.⁶⁵ For evidence of this, one only needs to review postings of disciplinary actions on many state boards’ Web sites. Does the nature of the overwhelming majority of conduct issues provide evidence that the educational performance expectations are out of balance, with an emphasis on technical skills and cognition to the detriment of behavior and value skills? Universities cannot ensure that graduates will comply with professional conduct standards; however, ignoring this factor and passing the problem to the public sector is costing the profession, patients, and the public.

Although no studies have been found that compare conduct with patient complaints, licensure disciplinary actions, conduct in education, or malpractice in physical therapy, several studies of the medical profession strongly suggest that professionalism is an essential competency that should be demonstrated as a requirement for graduation from medical school. Disciplinary action against physicians by medical boards was strongly associated with unprofessional behavior by the same individuals during medical school.^{33,56,66} The 2 most common behavioral problems were irresponsibility and diminished ability to improve the behaviors.^{33,56,66}

Fear that a student may institute legal action against those involved with his or her education is a major deterrent to addressing inappropriate behaviors.⁴¹ Although anyone can file a lawsuit at any time, an aggrieved student will not necessarily prevail when the student knows about professional expectations and has had fair treatment when expectations have not been met. The prevailing law across the country is that courts give deference to professional judgment of faculty, licensing boards, and facility administrators, especially in the health care arena. In

reality, the greatest risk is failing to act until patients or clients suffer detrimental harm. Risk management to avoid liability dictates that appropriate actions are taken, policies and procedures are followed, and documentation provides sufficient evidence to support professional judgment and fair procedures.

RECOMMENDATIONS

Utilizing a Decision-Making Rubric to Address Generic Inabilities

The case has been made in medical literature about the importance of identifying inappropriate behaviors early in a professional program, from an academic, clinical, and a legal perspective.^{32,35,36,39,42,56} Utilizing a decision-making method will assist the DCE, CCCE, and CI in identifying inappropriate behaviors and provide a structure for an objective process to arrive at a reasonable course of action. CIs need to be empowered to evaluate and remediate unprofessional behavior quickly rather than ignoring it or minimally addressing it, because the literature indicates the unlikelihood that the behavior will resolve on its own.^{5,33,41}

Although professional behavior issues have been described in the literature, as previously discussed, studies have not addressed a framework for decision making around this issue. In the absence of research, one can look to literature on ethical decision making, as ethical issues can involve decisions related to professional behavior and its impact in the context of health care. Three decision-making methods for addressing ethical situations have been described and are now being discussed in the context of physical therapist education programs and practice. In their text on medical ethics, Seedhouse and Lovett⁶⁷ describe an objective method for working through an ethical situation or dilemma. Kidder,⁶⁸ in his text on resolving ethical dilemmas, describes a related model that includes a 9-step decision-making process. Swisher et al⁶⁹ developed a decision-making framework to assist physical therapists and physical therapist assistants when confronted with ethical decisions, and describe a way to “walk all the way around” an ethical problem. These models may have utility in addressing Generic Inabilities if re-adapted. All models include detailed fact-finding, a

consideration of the ethical principles involved, and an assessment of the expected professional duties. An analysis of the desired outcomes and practical aspects of the situation, including tests for right versus wrong, are considered. This is followed by implementation of action(s) and re-assessment as needed. These models conclude with an investigation of options, implementation of a decision, and re-evaluation and reflection about what was implemented. No empirical studies have been conducted that examine the utility of these models for ethical decision making or for use in decision-making related to Generic Inabilities. These models have been adapted to offer a proposed framework where none currently exists. The framework can provide the educator and clinician with a more objective tool to assist in decision-making related to inappropriate professional behaviors, and can offer guidance for actions to address the problem(s).

The adapted decision-making rubric for addressing behavioral issues takes the practitioner through a series of 7 questions that lead to implementation of a specific action (Appendix). The first 3 steps involve investigation of the facts. Steps 1 and 2 ask the practitioner to determine the behavioral issues occurring in the situation and identify the individuals or parties involved. Step 3 considers the known facts of the situation and a search for any additional information needed before moving forward with the decision-making process. Step 4 requires the practitioner to analyze the significance of the situation. At this point in the decision-making process, the practitioner must determine the seriousness of the behavior problem. Is the behavior just annoying, or is it a significant problem with possible safety, legal, or ethical implications relevant to practice? What is the level of importance that needs to be attributed to this situation and its appropriate resolution? As part of this step, the specific legal implications previously discussed should be assessed carefully to determine the level of risk for the clinical facility, academic facility, patients, and staff involved.

The final steps in the rubric move the practitioner toward implementation of an action plan. Decision-making, Step 5, considers what options or strategies are appropriate

as actions to address the behavioral issues. Resource availability also must be considered here. Steps 6 and 7 are the implementation of the actions and evaluation of their effectiveness. Step 6 includes multiple means of communication between the DCE, CCCE, CI, and student, and possibly others as well. There may be a need to include faculty assessment of the student's overall presentation relative to professional behaviors while in the professional program and his or her readiness for the clinical setting. Interventions could include student counseling specific to the situation, explicit remedial interventions, removal from the clinical setting, and support for the CI and clinical site by the DCE. Support could include assisting in the development of specific strategies for remediation, framing a learning contract, or a site visit. The DCE should emphasize to the CI and CCCE that he or she is taking the student issue seriously and is available for assistance to address the situation effectively. Step 7, evaluation, is critical if the student remains in the clinical setting with remedial strategies in place. For this step, the DCE, CCCE, and CI must re-assess the situation and the effectiveness of the strategies utilized.

CONCLUSION

The conversation related to inappropriate behaviors must take place with all stakeholders. Although this topic is unpleasant to discuss and address, silence is detrimental to patient care. The documents of the profession, which describe the physical therapy “code of conduct,” serve as a standard and guide by which academic and clinical educators can examine performance, guide effective remediation, and support outcome decisions, particularly in the challenging assessment area of affective behaviors. Future empirical studies will be valuable in examining the success of addressing these behaviors and remedying them, and the utility of the framework for decision making provided in this discussion. When Generic Inabilities are identified and compared to the expected standards of the profession, and an objective, goal-directed plan is put into place using a framework for decision making; all stakeholders can participate in becoming more professional on an equal footing, because, “Professionalism is not a spectator sport.”¹

Appendix. Decision-making Rubric and Application To a Case

The Novice CI and the Aggressive Student

The student's clinical schedule indicated an 8:30 arrival time in the clinic. At 8:50, the student called the CI (inexperienced, this was her first student), and said that she had too many things to do and could not come to clinic. The CI felt intimidated by the student and said, "Well, OK." The syllabus required students to contact the DCE and CCCE before 8:00 am if unable to attend the clinical experience for any reason. The student left a phone message for the DCE stating that she did not attend clinic that day. The DCE contacted the student by telephone, and the response from the student was that she had to "pay bills, go to the bank and the post office." The student became defensive when questioned by the DCE and indicated these errands were more important than going to the clinic that day, adding, "Besides, the CI said it was OK."

| Steps of Rubric | Considerations | Possible Dialogue Between Student and CI |
|--|---|---|
| Step 1 - What is/are the behavioral issue(s) occurring in the situation? (Investigation) | <ul style="list-style-type: none"> • Student's lack of understanding of requirement of clinic attendance. • Patient care responsibilities. • Disregard for clinical contract obligations despite personal issues. • Disregard for Core Values and Generic Abilities. • CI's inability to address the behavior assertively. | |
| Step 2 - Who are the individuals or parties involved? (Investigation) | <ul style="list-style-type: none"> • The individuals involved are the student and the CI. • The CCCE and the DCE will need to be involved in remediation. | <p>CI – "I just finished a conversation with your (DCE) and we need to discuss your absence from clinic yesterday." Student – "What's the matter now?"</p> |
| Step 3 - What are the facts of the situation? What other facts do you need to know? (Investigation) | <p>Facts: The student called late to say she was not going to be at clinic that day because she had too many things to do. The CI was intimidated and silent about the inappropriate behavior, and said OK.</p> <p>What additional facts may you need to find?</p> <ul style="list-style-type: none"> • Was the student aware of the clinical contract, facility, and school policies related to attendance? • Was there an emergency need for the errands? • Are there generational or value differences that could explain the motivation for the behavior, even though this is not an excuse to behave in the described manner? • Had the CI seen and ignored or acquiesced to this behavior previously? • Can anyone else verify the accuracy of the facts as described? • Is there an unknown underlying cause? | <p>CI – "Your university, this facility, and I all have expectations of you as a student who has chosen your profession and has chosen to be here. When you began this clinical experience, we discussed mutual expectations and you agreed to uphold them. Not coming to clinic yesterday was not part of our agreement and is unacceptable." Student – "What's the big deal – it was only 1 day!"</p> |
| Step 4 - How significant is this situation? Is the behavior just annoying or is it problematic? Are there potential safety, legal, or ethical concerns associated with it that are relevant to practice? Does the behavior violate program or clinic's Policy and Procedures about attendance and subsequent repercussions for violations? (Analysis) | <ul style="list-style-type: none"> • This situation is problematic because it reveals the student's lack of appreciation for the importance of being in the clinic, despite personal issues. • It is not a safety issue but was a violation of the course syllabus, which is a contract. • This demonstrates a lack of commitment to a variety of Core Values, Generic Abilities, and principles from the Code of Ethics. | <p>CI – "The problem is evident in your response: you do not have an appreciation for and commitment to your patients if you are willing to disregard your responsibilities to attend to personal matters during your work time." Student – "Well, I had things come up that I needed to attend to. If I hadn't driven to the bank with my car payment it would have been late and then I would have to pay a late fee."</p> |

(continued)

| | | |
|--|--|--|
| <p>Step 5- What are your options for strategies or actions to address the behavior? (Decision-making)</p> | <ul style="list-style-type: none"> • Counseling with student by DCE; establishing a learning contract with explicit expectations for success and consequences of failure; student self-assessment. • DCE mentors CI in more assertive behavior, expectations for performance, and may also recommend APTA's CI Credentialing Program. • Documentation of the incident by the DCE and the CI – possible use of the Anecdotal Record form. • Reflective assignments using the self-assessment of the student based on Core Values, the Generic Abilities, Code of Ethics, and Policy and Procedures of the school and the facility. • Removal of student from the clinic. • Clinical site visit. • Written warning letter placed in student file. | |
| <p>Step 6 - What will you actually do to address the situation? (Implementation)</p> | <ul style="list-style-type: none"> • Implementation of counseling, learning contract, self-assessment. • Warning letter documented in student record. | <p>CI – “As a professional, you will need to manage patients and other work-related responsibilities. Bottom line—people will be depending on you. I will hold you accountable to the expectations we discussed. Today begins with verbal counseling and a learning contract we will develop in collaboration with your DCE. This document will serve as a formal written statement about my expectations for your performance. Do you understand that if this continues, further action will be taken?”</p> |
| <p>Step 7 - How will you evaluate effectiveness of your actions? (Evaluation)</p> | <ul style="list-style-type: none"> • Ongoing verbal or written communication between all parties related to the student’s performance. • CPI comments and VAS score should reflect level of achievement of appropriate professional behaviors at mid-term and at final. • Student self-reflection documents should demonstrate growth. • No further incidents related to this behavior should occur. • If related or similar behaviors occur, they should be addressed immediately by the CI and reported to the CCCE and the DCE for resolution based on a progressive discipline plan. | <p>Student – “I get it now. Do we have to go through all this? I don’t always think past my own needs or issues. I really think that this is more than is necessary to address this issue.”</p> <p>CI – “That brings up a good point about your ability to self-assess. It is important that you recognize your behaviors and determine how/what to do in a given situation. What are some ways we might help you do that?”</p> |

REFERENCES:

- Schulz S. Commentary, apathy: our true threat. *J Phys Ther Educ.* 2001;15(3):23-24.
- May WW, Morgan BJ, Lemke JC, Karst GM, Stone HL. Model for ability-based assessment in physical therapy education. *Phys Ther.* 1995;9(1) 3-6.
- Jette DU, Portney LG. Construct validation of a model for professional behavior in physical therapist students. *J Phys Ther Educ.* 2003;83:432-443
- May W, Straker G, Foord-May L. *Opportunity Favors the Prepared: A Guide to Facilitating the Development of Professional Behavior.* May & Associates Consulting: Stoneham Mass; 1997.
- Wolff-Burke M. Clinical instructors' descriptions of physical therapist student professional behaviors. *J Phys Ther Educ.* 2005;19(1);67-75.
- Hayes KW, Huber G, Rogers J, Saunders B. Behaviors that cause clinical instructors to question the clinical competence of physical therapist students. *Phys Ther.* 1999;79(7):653-671.
- Hayward L, Noonan A, Shain D. Qualitative case study of physical therapist students' attitudes, motivations, and affective behaviors. *J Allied Health.* 1999; 28(3):155-164.
- Gandy J. How clinicians address student clinical education problems. *Phys Ther.* 1984;64(5):729.
- Goulet C, Owen-Smith P. Cognitive-affective learning in physical therapy: from implicit to explicit. *J Phys Ther Educ.* 2005;19(3);67-72.
- Davis C. Affective education for the health professional. *Phys Ther.* 1981;61(11):1587-1593.
- Hojat M, Borenstein B, Veloski J. Cognitive and noncognitive factors in predicting the clinical performance of medical school graduates. *J Med Educ.* 1988;63:323-325.
- Papadakis M, Osborn E, Cooke M, Healy K. A strategy for the detection and evaluation of unprofessional behavior in medical students. *Acad Med.* 1999;74(9):980-990.
- Swick H, Szenas P, Danoff D, Whitcomb M. Teaching professionalism in undergraduate medical education. *JAMA.* 1999;282(9):830-832.
- Davis C. *Patient Practitioner Interaction: An Experimental Manual for Developing the Art of Health Care.* 3rd ed. Thorofare, NJ: Slack Inc; 1998.
- US Military Code of Conduct. Available at: http://www.silent-warriors.com/code_of_conduct.html. Accessed September 26, 2006.
- American Physical Therapy Association. *Code of Ethics.* Alexandria, Va: American Physical Therapy Association; 2000.
- American Physical Therapy Association. *Guide for Professional Conduct.* Alexandria, Va: American Physical Therapy Association; 2004.
- American Physical Therapy Association. *Assistant.* Alexandria, Va: American Physical Therapy Association; 2004.
- American Physical Therapy Association. *Standards of Ethical Conduct for the Physical Therapist Assistant.* Alexandria, Va: American Physical Therapy Association; 2000.
- Federation of State Boards of Physical Therapy. Available at: <http://www.fsbpt.org/licensing/index.asp>. Accessed on July 6, 2007.
- American Physical Therapy Association. *Professionalism in Physical Therapy: Core Values.* Alexandria, Va: American Physical Therapy Association; 2003.
- American Physical Therapy Association. *APTA Vision Sentence for Physical Therapy 2020 and APTA Vision Statement for Physical Therapy 2020.* http://www.apta.org/AM/Template.cfm?Section=Vision_20201&Template=/TaggedPage/TaggedPageDisplay.cfm&TPLID=285&ContentID=32061. Accessed April 23, 2007.
- American Physical Therapy Association. *Professionalism in Physical Therapy: Core Values. Self-Assessment.* Alexandria, Va: American Physical Therapy Association; 2003.
- American Physical Therapy Association. *Clinical Instructor Education and Credentialing Program.* Alexandria, Va: American Physical Therapy Association; 2005.
- Vendrey A, Carter R. The influence of training on the rating of physical therapist student performance in the clinical setting. *J Allied Health.* 2004;33(1):62-69(8).
- American Physical Therapy Association. Commission on Accreditation of Physical Therapy Education. *Evaluative Criteria for Accreditation of Educational Programs for the Preparation of Physical Therapists.* Alexandria, Va: American Physical Therapy Association; 2006.
- American Physical Therapy Association. *A Normative Model of Physical Therapist Professional Education: Version 2004.* Alexandria, Va: American Physical Therapy Association; 2004.
- American Physical Therapy Association. *Minimum Required Skills of Physical Therapist Graduates at Entry-Level.* Alexandria, Va: American Physical Therapy Association; 2005.
- American Physical Therapy Association. *Physical Therapist Clinical Performance Instrument.* Alexandria, Va: American Physical Therapy Association; 1997.
- Ingram D, Ayerdi M, Kuriadom R. A study of clinical education grading systems in physical therapy programs. Presented at: American Physical Therapy Association 2003 Annual Conference Meeting; June 18-22, 2003; Washington, DC.
- Carey J, Ness K. Erosion of professional behaviors in physical therapist students. *J Phys Ther Educ.* 2001;15(3):20-22.
- Arnold L. Assessing professional behavior: yesterday, today, and tomorrow. *Acad Med.* 2002;77(6):502-515.
- Papadakis M, Hodgson C, Carol S, Teherani A, Kohatsu N. Unprofessional behavior in medical school is associated with subsequent disciplinary action by a state medical board. *Acad Med.* 2004;79(3):244-9.
- Teherani A, Hodgson C, Banach M, Papadakis M. Domains of unprofessional behavior during medical school associated with future disciplinary action by a state medical board. *Acad Med.* 2005;80(Suppl 10):S17-20.
- Piper L. Addressing the phenomenon of disruptive physician behavior. *Health Care Manager.* 2003;22(4):335-339.
- Hicks P, Cox S, Espey E, et al. To the point: medical education reviews—dealing with student difficulties in the clinical setting. *Acad Med.* 2005;193(6):1915-1922.
- Stern DT, Papadakis M. The developing physician: becoming a professional. *N Engl J Med.* 2006;355:1794-1799.
- Swisher LL, Page CG. *Professionalism in Physical Therapy: History, Practice & Development.* St. Louis, Mo: Elsevier Saunders; 2005
- Arnold L. Responding to the professionalism of learners and faculty in orthopaedic surgery. *Clin Orthop Rel Res.* 2006;449:205-213.
- Wolff M. Addressing inappropriate professional behaviors demonstrated by physical therapy students on clinical rotations [dissertation]. Knoxville, Tenn: College of Education, University of Tennessee at Knoxville; 2000.
- Dudek N. Failure to fail: the perspectives of clinical supervisors. *Acad Med.* 2005;80(Suppl 10):S84-S87.
- Ginsburg S, Regehr G, Hatala R, et al. Context, conflict and resolution: a new conceptual framework for evaluating professionalism. *Acad Med.* 2000;75(Suppl 10):S6-S11.
- Ginsburg S, Regehr G, Lingard L. Basing the evaluation of professionalism on observable behaviors: a cautionary tale. *Acad Med.* 2004;79(10 Suppl):S1-S4.
- White R. *Controversies in Environmental Sociology.* Melbourne, Australia: Cambridge University Press; 2004
- Ricer RE. Defining preceptor, mentor, and role model. *Fam Med.* 1998;30(5): 328.
- Shepard K, Jensen G, eds. *Handbook of Teaching for Physical Therapists.* Burlington, Mass: Butterworth-Heinemann; 2002.
- Mostrom E. Professionalism in physical therapy: a reflection on ways of being in physical therapy education [editorial]. *J Phys Ther Educ.* 2004;18(1):2-3.
- Papadakis MA, Osborn EH, Cooke M, Healy K. A strategy for the detection and evaluation of unprofessional behavior in medical students. *Acad Med.* 1999; 74(9):980-990.
- Kalet A, Krackov S, Rey M. Mentoring for a new era. *Acad Med.* 2002;77(11):1171-1172.
- Stern D. Practicing what we preach? An analysis of the curriculum of values in medical education. *Am J Med.* 1998;104:569-575.
- Jette DU, Portney LG. Construct validation of a model for professional behavior in physical

- therapist students. *Phys Ther.* 2003;83:432-443.
52. Epstein R. Mindful practice. *JAMA.* 1999;282(9):833-839.
 53. Plack MM. The development of communication skills, interpersonal skills, and a professional identity within a community of practice. *J Phys Ther Educ.* 2006;20(1):37-46.
 54. Papdakis MA. Do as I say, not as I do. *Am J Med.* 1998;104:605-606.
 55. Gandy J. Getting the most out of clinical education. Paper presented at: National Student Conclave; October 21-24, 2004; Charlotte, NC.
 56. Papadakis MA, Teherani A, Banach MA, Knettler TR, Rattner SL, Stern DT, Veloski JJ, Hodgson CS. Disciplinary action by medical boards and prior behavior in medical school. *N Engl J Med.* 2005;353(25):2673-2682.
 57. Hemmer P, Hawkins R, Jackson J, Pangaro L. Assessing how well three evaluation methods detect deficiencies in medical students' professionalism in two settings of an internal medicine clerkship. *Acad Med.* 2000;75(2):167-173.
 58. Shue C, Arnold L, Stern D. Maximizing participation in peer assessment of professionalism: the students speak. *Acad Med.* 2005;80(Suppl 10):S1-S5.
 59. Higgs J, Jones M. *Clinical Reasoning in the Health Professions.* 2nd ed. Woburn, Mass: Butterworth-Heinemann; 2002.
 60. American Physical Therapy Association. *Guide to Physical Therapist Practice.* Revised 2nd ed. Alexandria, Va: American Physical Therapy Association; 2003.
 61. *Freilich v Upper Chesapeake Health Inc,* 313 F 3d 205, (4th Cir 2002).
 62. *Meyers v Columbia/HCA Healthcare Corp.* (6th Cir 2003).
 63. *Ghanem v Presbyterian Intercommunity Hosp.* (Cal App 2003).
 64. *Griffiths v Medical Board of Cal.* (Cal App 2002).
 65. Safriet B. "Cooperation and teamwork among board staff, board members and board attorneys: part I." *Federation Forum* [serial online]. 2006;21:1-2,13,16-17.
 66. Khaliq AA, Dimassi H, et al. Disciplinary action against physicians: who is likely to get disciplined? *Am J Med.* 2005;118(7):773-7.
 67. Seedhouse D, Lovett L. *Practical Medical Ethics.* New York, NY: John Wiley and Sons; 1992.
 68. Kidder M. *How Good People Make Tough Choices: Resolving Dilemmas of Ethical Living.* New York, NY: Fireside; 1995.
 69. Swisher LL, Arslanian LE, Davis CM. The realm-individual process-situation (RIPS) model of ethical decision-making. *HPA Resource:* 2005;5(3):1-8.

Copyright of Journal of Physical Therapy Education is the property of American Physical Therapy Association, Education Section and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.



Effective Classroom Discussions¹

William E. Cashin, professor emeritus • Kansas State University

*“The prototypic teaching method for active learning is discussion.”
Svinicki and McKeachie (2011, p. 36)*

What is a discussion? No one seems to define it. Lowman (1995, p. 159) suggested: “(A) useful classroom discussion...consists of student comments separated by frequent probes and clarifications by the teacher that facilitate involvement and development of thinking by the whole group.” In this paper, *discussion* is defined as two-way, spoken communication between the teacher and the students, and more importantly, among the students themselves.

This paper primarily addresses discussion in small classes that meet one or more times a week, or in smaller classes that meet one or more times during the week as part of a course consisting of one or more large lectures each week. Discussions can take the form of recitation, dialogue, and guided or open exchanges. However, many of the suggestions in this paper should also be useful for shorter discussion sessions as part of a lecture class, since discussions are an effective way to get students to actively process what they learn in lectures (Lowman, 1995, p. 161).

Further Readings. This IDEA Paper relies heavily on three books: Davis (2009), *Tools for teaching* (pp. 95-111); Forsyth (2003), *The professor's guide to teaching* (pp. 89-103); Svinicki and McKeachie (2011), *McKeachie's teaching tips* (pp. 36-54).

Other helpful books devoted entirely to discussions include Bligh (2000), *What's the point in discussion?*; Brookfield and Preskill (2005), *Discussion as a way of teaching*; Christensen, Garvin, and Sweet, (Eds.) (1991), *Education for judgment: The artistry of discussion leadership*; Kustra and Potter (2008), *Leading effective discussions*.

Strengths and Limitations of Classroom Discussion Approaches

Discussions are well suited to facilitate a number of course goals. As stated by Lowman, “(I)n addition to clarifying content, teaching rational thinking, and highlighting affective judgments, discussion is particularly effective at increasing student involvement and active learning in classes” (1995, p. 164). Discussion engages students in what they are presented with in lectures or other class assignments. Discussion approaches are effective in developing students' thinking skills and higher-level learning such as application, analysis, synthesis, and evaluation (Bloom et al., 1956), and also creativity (Anderson and Krathwohl, 2001; Bligh, 2000).

Discussion can help students acquire better communication skills as they learn to present their ideas clearly and briefly; it also provides opportunities to practice listening to, and following what, others are saying. In addition, discussions can contribute to students' affective development by increasing their interest in a variety of subjects, helping to clarify their values, and aiding in recognizing — and perhaps changing — some attitudes.

As a teaching method, discussion permits students to be active in their own learning, which increases their motivation to learn and makes the process more interesting. And finally, discussion provides feedback to you about your students' acquisition of learning through questions, comments, elaborations, and justifications. These interactions allow you to plumb the depths of students' understanding.

¹This paper is an update of IDEA Paper No. 15, *Improving Discussions* (Cashin & McKnight, 1986).

Like all teaching methods, discussion approaches have their limitations as well as their strengths. Discussions are *not* an effective way to cover a significant amount of content, and they are time consuming, requiring more preparation and class time. However, even when you are very well prepared, the discussion may not follow the direction you anticipated, resulting in less control. To some extent, you must go where the students' questions and interests take the group, which may not be consistent with your initial plan.

It can also be difficult to get students to participate in a discussion, particularly when some of them may not even know *how* to effectively participate. Finally, a topic may be very controversial or elicit excessive emotional reactions. Discussion is a complex teaching method that requires careful planning and preparation for both you and your students (Brookfield and Preskill, 2005). A number of authors provide additional details about the strengths and limitations of discussions (see Bligh, 2000, chap. 1-4; Brookfield and Preskill, 2005, chap. 2; Forsyth, 2003, p. 93).

Even with the challenges of discussion approaches, a number of strategies can make them more effective and maximize their benefits.

Creating the Expectation for Student Participation in Discussion

If at all possible, create a physical environment that supports discussion. Arrange the seating so it is easy for everyone to see one another, ideally in some kind of circle or curve, making yourself part of the group (e.g., not behind a desk, but seated with your students). Padded chairs can help, if they are available. Help students get to know each other and get them to talk during the first class session. Bligh (2000, pp. 173-177) provides further guidance about the physical environment.

Early in your course, perhaps during the second class, share your expectations for participation, both verbally and in the syllabus, including the ground rules for discussion. For example, students are to come to class prepared, and to have read the assignment or completed the appropriate research; they are to participate in the discussion and test their ideas and conclusions; they should raise their hands (or, alternatively, you will call on them randomly).

Below are the stages of a typical classroom discussion, which are based on the steps in problem solving found in almost any general psychology textbook.

- Define the question, topic, or problem to give the discussion focus.
- Have students suggest possible answers or solutions.
- Collect relevant information or data that might help answer the question(s) at issue.
- Evaluate positions argued by, or solutions proposed by, the students during the discussion.

- Try to have the group reach a decision about the best position to start with or the best solution to try, based on the discussion. (See Svinicki and McKeachie, 2011, p. 42, for a related approach; and Bligh, 2000.)

To ensure that students take discussions seriously, you may need to adjust your existing reward system (Brookfield and Preskill, 2005). If you will grade students for participation, explain how. Consider self-evaluations, peer-to-peer evaluations, and rubrics that behaviorally describe expected and unacceptable levels of participation (see Davis, 2009, pp. 110-111, for suggestions).

Teacher's Roles

Get to know your students. Obviously this applies to all forms of teaching, but it can be particularly important for successful discussions. Along with the class roster, you probably have information about your students provided by the registrar's office — study it. Ask students about their background and their goals (Cashin, 2010, p. 3). In IDEA Paper No. 39, Fleming (2003) describes a number of strategies to help you develop rapport with your students.

Be prepared. An effective discussion requires much more preparation than an effective lecture. In a lecture, you can decide what you will cover. In a discussion, you should be prepared to explore any issue reasonably related to the discussion topic. This means you must know the topic very well. Be ready to address potential issues or questions that the students might bring up. Outline your possible answers or responses.

Begin the discussion. Many times, and certainly the first time, you as the instructor will begin the discussion. Svinicki and McKeachie (2011) discuss a number of ways to start the discussion — with a question, a controversy, or a common experience. Choosing something from the students' "real life" is one tactic. Providing a common experience by means of a reading, film, or similar example of mass media is another. Ensure that your students have sufficient information to make the discussion productive.

Facilitate the discussion.

- Be patient, since discussions take time to get started. Allow for pauses and silence. Although silence may feel socially awkward, it gives both you and the students time to think. You may need to train your students (and yourself) to feel comfortable with silence.
- Listen to what each student says.
- Observe who is — and is not — participating.

Ask Questions. Ask a student for clarification, or to support his or her comment or opinion; use *open-ended* questions (that cannot simply be answered by a "yes" or a "no" or one word); ask *divergent* questions (where there can be more than one *acceptable* answer). However, do *not* question a single student too long.

Deal with conflicts. It is important *not* to ignore conflicts. First, try to clarify what seems to be the disagreement; it might simply be a cognitive misunderstanding. Listing the pros and cons visually (e.g., whiteboard, handout, discussion board) can be helpful. If the conflict involves many students, let the group talk about their disagreement in some manner. (See also Kustra and Potter, 2008, pp. 59-65.)

Provide summaries. Periodically during the discussion, and certainly at the end, provide a summary and perhaps some conclusions of the discussion. Verify group consensus and check to see whether *all* the students do actually agree: “Does that statement reflect what *all of you* think?”

Reflect on what took place during the discussion. After the discussion, think about what worked well and what you might do differently. Think about which student(s) did or did not participate in the discussion. Which of them contributed most? Did any student(s) dominate? What was the quality of the students’ comments? And especially, what did the students learn?

Further Readings — Asking and Answering Questions. Cashin (1995), IDEA Paper No. 31: Answering and Asking Questions; Davis (2009), chap. 12 and 13; Forsyth (2003), pp. 72-74; Kustra and Potter (2008), pp. 31-38; Svinicki and McKeachie (2011), chap. 5.

Students’ Roles

Students should be prepared. In keeping with your expectations, students are to come to the discussion prepared. Typically, this means that not only are they to have read the assignment, but thought about it in the context of the topic being studied.

Students should participate. Assuming that discussions are a required part of the course, students must participate. Totally silent observers do not earn full credit in such a course. This does not mean that silent observers do not learn anything, but the students who participate learn more, which is the purpose of a discussion class.

Students should explain with clarity. One purpose of discussions is to allow students to test their ideas and conclusions. This requires not only that students develop ideas, but that they explain their ideas or conclusions with clarity, and where possible, with reasonable brevity. Forsyth (2003, p. 101) suggests that students should make statements brief and clear, and ask for clarification if they don’t understand what someone else has said.

Students should listen. Student participation involves not only speaking, but listening to what other students are saying, and either indicating some level of understanding or asking for clarification. If you see that some students are so eager to make their own points that they do *not* listen to what the previous speaker has said, you might introduce a rule that no one may make his or her point without first

paraphrasing what the previous speaker said — to that speaker’s satisfaction. (See also Bligh, 2000, pp. 32-33.)

Fostering Participation

First, what are some obstacles to student participation? Svinicki and McKeachie (2011, pp. 44-45) discuss five barriers to good discussion: habits of passive learning; fear of appearing stupid; trying too hard to find the answer the teacher is looking for; failing to see value in the discussion topic or process; and wanting to settle on a solution before alternatives have been considered.

Davis (2009, p. 107) outlines six faulty assumptions students often hold about discussions: one must argue for only one position; knowledge is really just opinion; personal experience is the real source of knowledge; issues should not be discussed unless there is agreement; individual rights are violated when ideas are challenged; and individuals in a discussion should never feel uncomfortable.

Davis (2009, p. 99) also lists nine pointers you can give your students about participating in discussions. For example, students should seek the *best* answers instead of trying to convince others of the correctness of *their* answers; they should try to keep an open mind rather than stick to a previous opinion; and students should stay with the present issue before introducing a new one.

Several other specific strategies can promote participation in discussions.

Ask general (divergent) questions. Questions that can have more than one acceptable answer (e.g., “What is your opinion about...?”) can lead to more discussion. In addition, give students your questions about the reading *before* you will be discussing them. (See Svinicki and McKeachie, 2011, pp. 47-48.)

Avoid looking only at the student talking. Although it may seem counterintuitive to look away, and eye contact does tell a student that you are paying attention, looking too long at one student can seem threatening. Also, you need to monitor how the other students in the group are reacting.

Control excessive talkers. Even though the students who talk the most are sometimes the “better” students, avoid automatically calling on them first, even after a seemingly long silence. Ask to hear from someone who hasn’t said anything yet. If one student’s excessive talking becomes a problem, you may want to talk with that student about it outside of class. (See also Brookfield and Preskill, 2005, pp. 169-177.) Sometimes the excessive talker is you (or me) — the teacher! Videotaping a class and watching it later may provide useful information about this (as well as many other aspects of your class). (See also Brookfield and Preskill, 2005, pp. 193-200.)

Ask for examples and illustrations. This is particularly important when discussing complex ideas, or concepts students often have difficulty understanding.

Allow for pauses and silences. Sometimes in American culture, we act as though there should never be a quiet time in our conversations. Silence, even for a minute or more, allows the students, and you, time to think. This “wait time” is especially helpful to students who are more introverted and may not be getting an opportunity to participate (Davis, 2009).

Be sensitive to feelings and emotional reactions. Some topics may generate strong negative — or positive — feelings, or you may notice that a student is becoming upset or angry as the discussion progresses, any of which may become obstacles to learning. Ideally, the student will bring up the problem so it can be discussed. To prompt this, you may simply wish to say, “You seem to have strong feelings about this.” Or you may need to explore: “Would you say some more about that?” You may want to talk to the student after class.

Encourage and recognize students’ contributions. Listen carefully to each student’s comments, sometimes paraphrasing to show that you understand. Give students a chance to clarify what they meant, or link Student B’s comment to something Student A said.

Further Readings — Effective Groups and Specialized Activities (can be used with discussion classes as well as groups that are part of large classes). Bligh (2000), pp. 105-188; Brookfield and Preskill (2005), chap. 6; Davis (2009), chap. 21; Forsyth (2003), pp. 103-110; Svinicki and McKeachie (2011), chap. 14 and 15.

Conclusion

You should *not* consider the suggestions in this IDEA Paper to be prescriptions — things that you *must* do. Rather, think of them not as *answers*, but as *questions*. Ask yourself, “To what extent might these suggestions help the students in my class?” You are the teacher — you are the one to decide.

Further Readings — Facilitating Online Discussions. While the focus of this paper is on classroom discussions, a number of authors have suggestions for effective use of discussion via technology. See Brookfield and Preskill (2005), chap. 11 and 12; Davis (2009), pp. 497-503; Forsyth (2003), pp. 233-260; Svinicki and McKeachie (2011), chap. 17.

References

- Anderson, L.W. & Krathwohl, D. (2001). *A taxonomy for learning, teaching, and assessing: A revision of Bloom's taxonomy of educational objectives*. New York: Longman.
- Bligh, D.A. (2000). *What's the point in discussion?* Portland, OR: Intellect Books.
- Bloom, B.S., Engelhart, M.D., Furst, E.J., Hill, W.H., & Krathwohl, D.R. (1956). *Taxonomy of educational objectives: Handbook I, the cognitive domain*. New York: David McKay.
- Brookfield, S.D. & Preskill, S. (2005). *Discussion as a way of teaching* (2nd ed.). San Francisco: Jossey-Bass.
- Cashin, W.E. (1995). Answering and Asking Questions. IDEA Paper No. 31. Manhattan, KS: Kansas State University, Center for Faculty Evaluation and Development.
- Cashin, W.E. (2010). Effective Lecturing. IDEA Paper No. 46. Manhattan, KS: The IDEA Center.
- Cashin, W.E. & McKnight, P.C. (1986). Improving Discussions. IDEA Paper No. 15. Manhattan, KS: Kansas State University, Center for Faculty Evaluation and Development.
- Christensen, C.R., Garvin, D.A., & Sweet, A. (Eds.), (1991). *Education for judgment: The artistry of discussion leadership*. Boston: Harvard Business School.
- Davis, B.G. (2009). *Tools for teaching* (2nd ed.). San Francisco: Jossey-Bass.
- Fleming, N. (2003). Establishing Rapport: Personal Interaction and Learning. IDEA Paper No. 39. Manhattan, KS: The IDEA Center.
- Forsyth, D.R. (2003). *The professor's guide to teaching: Psychological principles and practices*. Washington, DC: American Psychological Association.
- Kustra, E.D.H. & Potter, M.K. (2008). *Leading effective discussions*. STLHE Green Guide 9. London, Canada: Society for Teaching and Learning in Higher Education.
- Lowman, J. (1995). *Mastering the techniques of teaching* (2nd ed.). San Francisco: Jossey-Bass.
- Svinicki, M. & McKeachie, W.J. (2011). *McKeachie's teaching tips: Strategies, research, and theory for college and university teachers* (13th ed.). Belmont, CA: Wadsworth.

T: 800.255.2757

T: 785.320.2400

F: 785.320.2424

E: info@theideacenter.org

www.theideacenter.org

©2011 The IDEA Center

Manhattan, Kansas

Maximizing Rush Library Resources

Presented by Reina Williams, MLIS
Reference Librarian and
Education Coordinator
Rush University Library



What will you learn today?

Advance search strategies in PubMed and Scopus

Google search strategies and tips

Keywords and Subject Headings

Brainstorming keywords

List or draw a map of terms you would use to search on a topic of interest.

If you do not have a topic you can choose from a topic below:

Researching health disparities in rural areas of Illinois

How to improve glucose levels in patients diagnosed with diabetes?

What is PubMed?

How do I access PubMed?

Let's go to the Rush Library's Website!

Quick Links

Databases


e-Journals

e-Books

Catalog

CHAT

Databases

CINAHL Complete
Ovid
Psychiatry Online (incl. DSM Premium)
PsycINFO
PubMed
Scopus
UpToDate
Google Scholar
 All Databases...

Resources

Access Medicine
ClinicalKey
InCites Journal Citation Reports
Mobile Resources
Nursing Reference Center
RefWorks
VisualDx
Copyright Resources **New**

Services

Dissertation & Thesis Formatting
Electronic Reserves
Faculty Publications Database
Interlibrary Loan
ILLiad Login
Library Account Registration/Update
Renew Books and Media
Schedule an Appointment

Rush

My Apps
University Portal
RULearning
Rush Archives
Rush Email
Rush University

Scopus

Tips for Searching in Scopus

Google/Google Scholar

Research Help

Librarians are available

Monday - Thursday, 9:00 am - 4:30 pm

Friday, 9:00 am - 4:00 pm

Research Help

Schedule a one-on-one consultation with a librarian for assistance with:

Database and web searching

To schedule, visit or call (312) 942-5950 during our hours, or email lib_ref@rush.edu

Thank you!

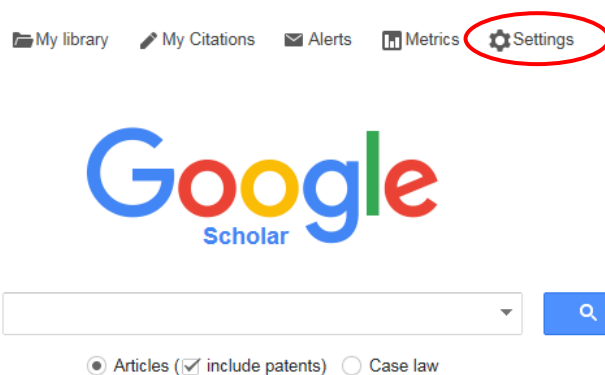


Link Google Scholar to Rush Library Holdings

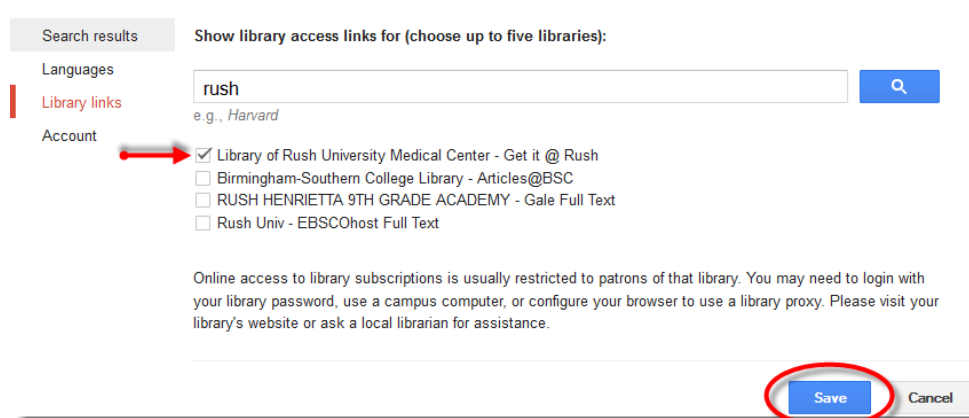
Often, the documents found through Google Scholar are not freely available in full-text.

For easier (and free) access to these same documents through Rush Library, link Google Scholar to Rush Library holdings.

1. Access Google Scholar at <http://scholar.google.com>.
2. If you have a Google account, log in. If not, you will need to apply the following changes to any computers you regularly use.
3. Click *Settings*.
4. Click *Library Links* in the horizontal menu.
5. Enter "Rush" into the search bar, and click the magnifying glass icon.



6. Mark the checkbox next to "Library of Rush University Medical Center—Get it @ Rush."



7. Once the Scholar preferences have been set, a Get It @ Rush icon can be accessed by clicking *More* beneath each search result. Click the *Get It @ Rush* icon to see if Rush Library offers full-text access to the document. If access is not available through Rush, you will be given the option to request the item through interlibrary loan.

If Google does not include a *Get It @ Rush* icon for an article, you can find out if Rush offers full text access to the journal by searching for the journal title in our eJournals list (click *eJournals & eBooks* from the Quick Links column on our library website).

Questions? Contact us at (312)-942-5950 or lib_ref@rush.edu, and visit our website at <http://rushu.libguides.com/>

SCOPUS *Quick Start Guide*

THE LIBRARY OF RUSH UNIVERSITY MEDICAL CENTER

Scopus is a large multidisciplinary database of references to peer-reviewed literature from more than 20,000 journals and other resources.

Searching Scopus

1. Go to the Library homepage at <http://rushu.libguides.com/>
2. In the left-hand Quick Links menu, click on *Scopus*.

The screenshot shows the Scopus search interface. At the top, there are tabs for "Documents", "Authors", "Affiliations", and "Advanced". Below these is a search bar with the text "Search" and a placeholder example: "E.g., 'Cognitive architectures' AND robots". To the right of the search bar is a dropdown menu currently set to "Article title, Abstract, Keywords" with a plus sign icon. Below the search bar are "Limit" options, including "Date range (inclusive)" with radio buttons for "Published" (selected) and "All years", and "to Present". There is also an option for "Added to Scopus in the last 7 days". Three callout boxes provide instructions: 1. "For a keyword search, enter your search statement in the search box. Use curly brackets {} around phrases." 2. "Article Title, Abstract, Keywords" is selected by default. Use the drop-down menu to select other options." 3. Use the "Limit to" options to restrict your search by date, document type or subject area.

Refining Your Results

1. Sort

From the drop-down menu on the top right of the results page, you can sort your results by:

- Date (Newest): the default sort option. The most recently published results will appear at the top of the list
- Date (Oldest): the oldest results will appear at the top of the list
- Cited by: the number of times a work has been cited by other authors
- Relevance: the number of times your search terms appear in the record
- First Author (A-Z) or (Z-A): alphabetical by author surname
- Source Title: alphabetical by source (e.g., journal) title

2. Search within your results

If you have a large number of results, you can narrow your search by entering additional keywords in the *Search within results* box on the left-hand side of the results screen.

Questions? Call (312) 942-5950 or email Lib_Ref@rush.edu
Visit the Library website at <http://rushu.libguides.com/>

3. Limit

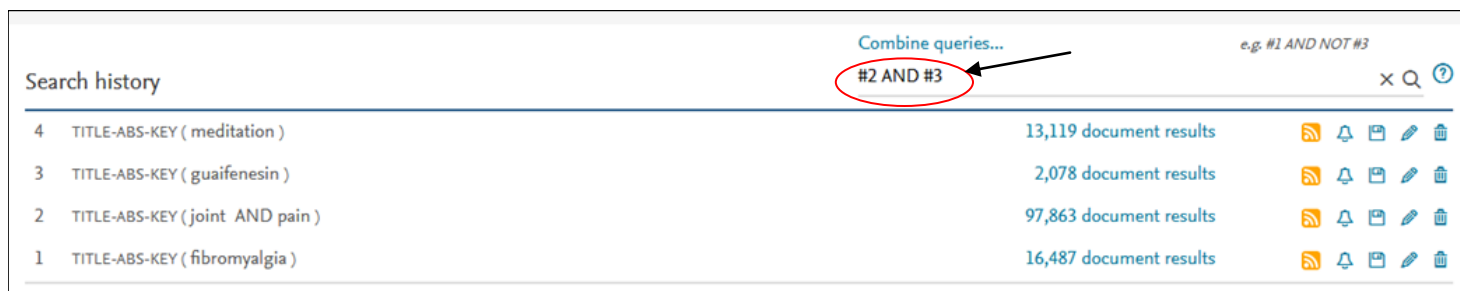
Limit your results using the list of options on the left side of the page. These include year of publication, author, subject, and document type.

Search History and Combining Results

A good search strategy is to search for keywords separately and then combine the results to narrow down your topic. To access the search screen and your search history, click on *Search* in the upper left.



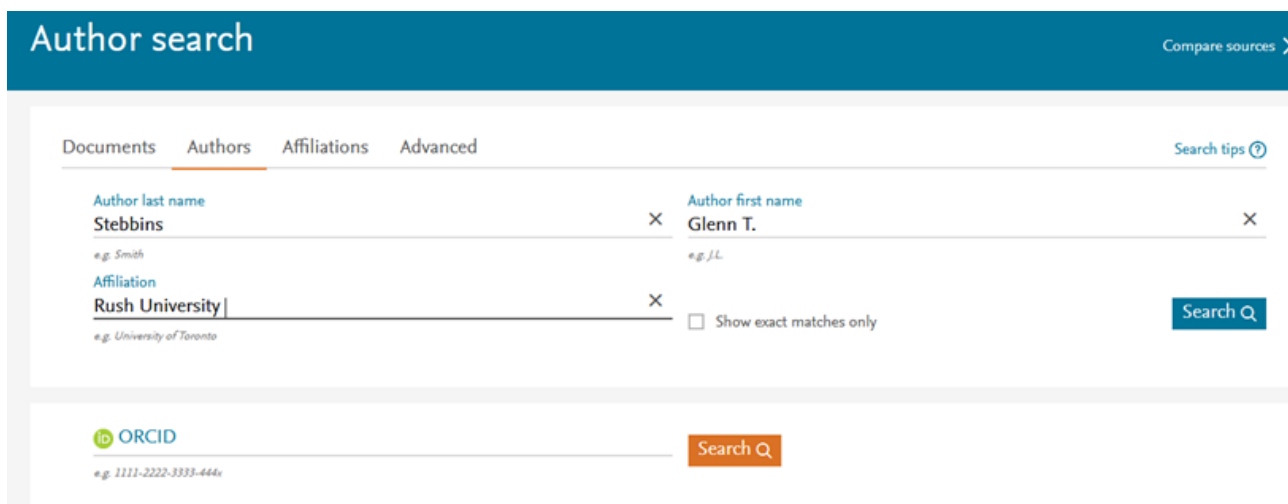
Perform a search for each keyword separately. Each search will be listed in the search history near the bottom of the screen. You can combine searches by entering the search numbers that you want to combine into the *Search history* search bar. For example, entering *#2 AND #3* will create a new search for all documents that contain both the search terms from search #2 and search #3.



Searching by Author

You can also search by Author or Affiliation.

1. Click on the *Author Search* tab on the Scopus homepage.
2. Enter the surname and initials of the author of the paper in the format shown on screen
3. Enter the institutional affiliation (e.g., Rush University), if known, and click *Search*.
4. Click the box next to the desired author name and click *Show Documents*.
5. All the papers by this author are listed by date.
6. You can narrow your results with the *Search within results* bar and *Refine* options.



After selecting an author you can also click on *View citation overview* to see a list of the author’s papers and the number of times that each has been cited. Click on the individual citation counts to view the list of documents that cited the original paper.

Sorting General Searches using Cited by

One of the unique features of Scopus is the ability to see how many times a paper is cited. You can also sort your search results by the number of times which the paper has been cited. The number in the *Cited* column indicates how many times the paper has been cited. Click on the number to bring up the list of papers that cite this paper.

| Documents | Citations | <2014 | 2014 | 2015 | 2016 | 2017 | 2018 | Subtotal | >2018 | Total |
|----------------------------|---|-------------|------------|-------------|-------------|-------------|------------|-------------|----------|--------------|
| | Total | 7475 | 920 | 1084 | 1182 | 1406 | 512 | 5104 | 0 | 12579 |
| <input type="checkbox"/> 1 | Movement Disorder Society-Sponsored Revision of the Unified ... | 2008 | 290 | 121 | 181 | 203 | 282 | 121 | 908 | 1198 |
| <input type="checkbox"/> 2 | Movement Disorder Society Task Force report on the Hoehn and... | 2004 | 234 | 71 | 96 | 101 | 111 | 37 | 416 | 650 |
| <input type="checkbox"/> 3 | Movement disorder society-sponsored revision of the unified ... | 2007 | 147 | 43 | 69 | 63 | 76 | 23 | 274 | 421 |
| <input type="checkbox"/> 4 | Risk factors for nursing home placement in advanced parkinso... | 1993 | 299 | 14 | 13 | 15 | 13 | 5 | 60 | 359 |
| <input type="checkbox"/> 5 | Depression rating scales in Parkinson's disease: Critique an... | 2007 | 212 | 25 | 29 | 37 | 36 | 11 | 138 | 350 |

Saving, Printing and Emailing Records

On your results page, check the boxes next to the references you want to save, print or email. Click *More* above the results list, and select the desired action. Follow the on-screen instructions. The *Create bibliography* option allows you to format selected references in a range of referencing styles (e.g., APA, Harvard).

Accessing the Paper (Get It @ Rush) **Get It@RUSH**

When you find an article that is appropriate for your topic, click to see if Rush has a copy of the article. The example below is for a link to an online database that has the article. Click on the database link to access the full text. If Rush does not have a print or digital copy, you can request the article via interlibrary loan.

Title: Intravascular immunity as a key to systemic vasculitis: a work in progress, gaining momentum
Source: Clinical and experimental immunology [0009-9104] Ramirez, G A yr:2014 vol:175 iss:2 pg:150 -166

Full Text

- Full text available via [Synergy Blackwell Free](#)
- Full text available via [Wiley Online Library 2013 Full Collection](#)
- Full text available via [Wiley Online Library STM 2011](#)

Filters

Filters are available in the left navigation column and may be used to focus search results. Click on a filter to activate or deactivate the filter. Multiple filters can be used at the same time.

To reveal additional filter options, click **Show Additional Filters** or **Customize** under each filter type. Check desired selections then click **Show** button.



The Filters Activated message appears above the search results list. Applied limits remain in effect until they are removed or cleared.

Advanced Searching

The **Advanced** link provides two options to refine a search:

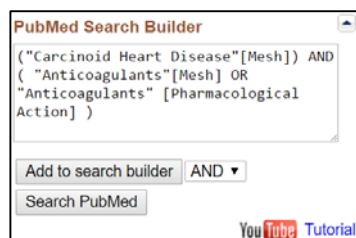
1. Use the **PubMed Advanced Search Builder** to create a search using **AND**, **OR**, or **NOT**. Apply a specific field to your term using the drop down menu. The **Show Index List** displays the search field index and the number of citations for each term.
2. **History** tracks and numbers each of your previous search strategies. Click on “Add to Builder” to add previous searches to your Advanced Search Builder.

MeSH Database

PubMed citations are indexed using a powerful vocabulary called Medical Subject Headings (MeSH).

Use the Drop-Down Search menu to access the **MeSH** Database. Search for a term or concept and click **Search**. Click on the desired term to view that term (when multiple items are retrieved) and select subheadings and other options.

Click Add to Search Builder button on the right side of the page to start a PubMed search. Other MeSH Searches may be added. Click the Search PubMed button to complete the search.



Clinical Queries

Clinical Queries makes it easy to find articles that report applied clinical research. You can search for Systematic Reviews, Medical Genetics, or Clinical Study Categories.

1. Click on the link from the PubMed homepage
2. Enter a search term in the box.
3. Click the Search Button
4. Click **See All** at the bottom of the page to return to PubMed.

Funded in whole or in part with Federal funds from the National Library of Medicine (NLM), National Institutes of Health (NIH), under cooperative agreement No. UG4LM012340 with the University of Maryland, Baltimore. This resource is freely available at:

<https://nmlm.gov/training/resources/pmtri.pdf>

Reviewed: January 2018

PubMed is the U.S. National Library of Medicine’s (NLM) premiere search system for health information. It is available **free** on the Internet at <https://pubmed.gov>.

PubMed Content

Over 27 million citations for biomedical literature from MEDLINE, life science journals, and online books.

Citations may include links to full-text content from PubMed Central and publisher web sites.

PubMed Features

- Sophisticated search capabilities, including spell checker, Advanced Search Builder, and tools to search for clinical topics.
- Find Search terms using the MeSH (Medical Subject Heading) database of MEDLINE’s controlled vocabulary.
- Store citation collections and receive e-mail updates from saved searches using PubMed’s My NCBI.
- Link to full-text articles, information library holdings, and other NLM databases and search interfaces

Assistance and Training

Click on the **Help** link or on the PubMed homepage under “Using PubMed” select **PubMed Quick Start Guide** or **PubMed Tutorials**.

PubMed Searching

To search PubMed, type a word or phrase into the search box (e.g., a subject, author, and/or journal). Then click the **Search** button or *Enter* key.

Optional: combine search terms with connector words: **AND**, **OR**, or **NOT** using upper case letters.

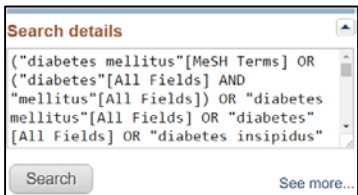
An Auto Suggest drop-down menu appears when entering words and the **Titles with Your Search Terms** option may appear in your search results.

Once you run your search, PubMed displays a list of results in Summary format. To change how results are displayed, click on **Format: Summary** to change the format.

Search Details

Search Details is located on the right navigation column. This box provides information on how PubMed ran the search. PubMed looks first for the entire word or phrase as:

1. Medical Subject Heading (MeSH) term
2. Journal Titles
3. Author(s)



PubMed finally will search **All Fields** for the word(s). Update a search by making changes in the Search Details box and click Search to run the new search strategy.

Sensors

Sensors display results in a shaded area above the regular PubMed search results.

- **Citation Sensor:** matches search terms with citation elements (e.g. blood choi 2009)
- **Gene Sensor:** identifies gene symbols linking to gene citations and databases (e.g. CFTR)

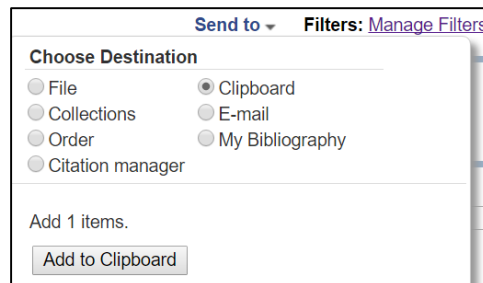
Similar Articles

This feature searches for citations similar to the one selected. In the Summary format, click on the **Similar Articles** link under each citation.



Clipboard

The **Clipboard** feature stores selected citations from one or more searches for eight hours. Select citations by clicking the check box next to each citation. From the **Send To** menu, select **Clipboard**; then click “Add to Clipboard.”



Click on the Clipboard items link to view citations. Permanently store citations in PubMed My NCBI **Collections**, also accessed from the **Send to** menu.

Access Full-Text

Many PubMed citations offer links to the full text of articles through PubMed Central (PMC), a free digital archive of life sciences journal literature, to library holdings, and to publisher websites. Loansome Doc allows registered users to order copies of articles from a medical library. Contact your librarian for details or visit <https://nnlm.gov> for more information.

Print, Email, and Download

After selecting Citations (e.g. from checked boxes or **Clipboard**), identify a format (click on Summary for additional formats and print directly from you browser.

From the **Send To** menu, you can choose to **E-mail** the citations to yourself or a colleague or select **Citation Manager** to create a file to use with an external citation management software.

My NCBI

My NCBI is a free tool that retains user information and database preferences to provide a customized service for many NCBI databases, including PubMed.

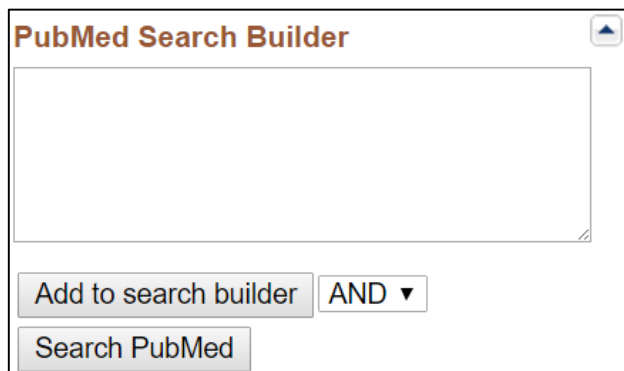
Sign in to NCBI

PubMed's **My NCBI** features:

- Save searches
- Set personal preferences and display formats
- Store search strategies and citation collections
- Develop personal filter options.
- Create alerts by offering automatic e-mail updates and RSS Feeds of saved searches

Use MeSH Terms to Search PubMed

Use the PubMed Search Builder to combine multiple MeSH terms and Subheadings.



1. Check the boxes of the desired MeSH terms, subheadings, and/or restrictions.
2. Select either **AND**, **OR**, or **NOT** from the drop-down menu, then click the **Add to Search Builder** button.
3. Continue to search for other MeSH and add terms.
4. *NOTE: Make any necessary changes to the parentheses and terms in the search box to clarify the search.*
5. When finished, click **Search PubMed**

Alternatively: do complex searches in pieces. Send groups of terms separately to PubMed and combine terms in PubMed's **Advanced Search Builder** utilizing your **Search History** to add items to your search builder.

Advanced MeSH Tips

Search **PubMed** directly by using specific MeSH headings, subheadings, and other qualifier codes (not case sensitive). For the complete list, visit **PubMed Help** and the **Search Field Descriptions and Tags** link.

- **MeSH Headings:** **[mh]** or **[MeSH]** may be added to a term to restrict your PubMed search to only MeSH terms (e.g. knee [mh])
- **Subheadings:** Two letters may be used for subheadings. Therapy is **th**; to search for articles on cancer therapies, you can use "Neoplasms/therapy"[Mesh] or Neoplasms/th as equivalent searches.
- Do not include MeSH terms found below this term in the MeSH hierarchy: use **[mh:noexp]**, **[majr:noexp]**, or **[sh:noexp]** to restrict searches to articles focused on the broadest MeSH term.

Assistance and Training

Help and **Tutorials** are available. Find additional information in the MeSH browser:
<https://www.ncbi.nlm.nih.gov/mesh>.

*Funded in whole or in part with Federal funds from the National Library of Medicine (NLM), National Institutes of Health (NIH), under cooperative agreement No. UG4LM012340 with the University of Maryland, Baltimore. This resource is freely available at:
<https://nmlm.gov/training/resources/meshtri.pdf>*

Reviewed: January 2018

Searching PubMed® with MeSH®

The National Library of Medicine's (NLM) **Medical Subject Headings (MeSH)** is the controlled vocabulary thesaurus used for indexing articles for PubMed, available at **PubMed.gov**.

MeSH provides a consistent way to retrieve information where different terms are used by authors for the same concept or topic. MeSH terms apply to citations with the label "*PubMed - Indexed for MEDLINE.*"

Features in MeSH

- Contains over 28,000 descriptors.
- Over 90,000 entry terms.
- 240,000 Supplementary Concept Records to specific chemicals, diseases, and drug protocols.
- MeSH terms can be used to improve your searches and help broaden or narrow your results.

Getting Started

Access MeSH in PubMed from the drop-down menu OR click on the **MeSH Database** link from the PubMed homepage.



Enter a topic in the search bar and click the Search button. Results will vary from: a single term (prognosis), multiple terms (measles), or related terms (cancer).

[Neoplasms](#)
 1. New abnormal growth of tissue.

Note: Verify that the definition of the term matches the expected definition.

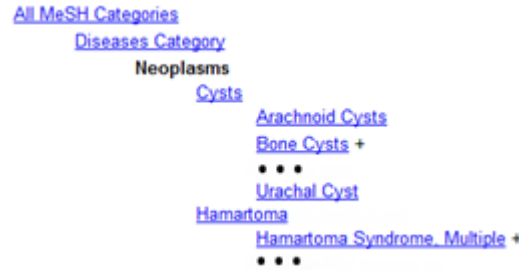
Refine a Search

The MeSH Database offers options to clarify and focus searches. Click the selected MeSH term (Neoplasms in this example) to view:

- Definition, often with the year introduced.
- Check boxes including:
 - **Subheadings**
 - Restrict Search to MeSH Major Topic
 - Do not include MeSH terms found below this term in the MeSH hierarchy.
- **Entry Terms** (similar terms used by authors)
- **See Also** related and linked terms
- MeSH hierarchy of linked terms.

The MeSH Hierarchy

MeSH terms are arranged hierarchically by subject categories with more specific (narrower) terms arranged beneath broader terms. PubMed automatically searches to include all narrower terms.



An unrestricted search for **neoplasms** will include articles which focus on the main term (neoplasms), but also include the narrower terms (e.g. urachal cyst).

Check **Do not include MeSH terms found below this term in the MeSH hierarchy** for articles focused only on the main term and eliminate the narrower terms.

Note: Focus a search by using the MeSH hierarchy to identify appropriate broader or narrower terms or to find additional search terms. Click on terms to access them.

Related Information

Search MeSH and select one specific term. Use **Related Information** to search with the term.

- PubMed
- PubMed – Major Topic
- Clinical Queries
- NLM MeSH Browser

Major Topic Headings

Subject analysts examine each article and assign the most specific MeSH terms applicable, with a related subheading; typically ten to twelve headings per citations. In PubMed, the major topic is represented by an asterisk.

MeSH Terms
[Fentanyl](#)
[Neoplasms/therapy*](#)

To view MeSH terms for a selected article in PubMed, click on the link to **MeSH Terms** below the citation in the Abstract Format.

Publication Types, MeSH Terms, Substances

In the MeSH Database, use **Restrict to MeSH Major Topic** to limit a search to citations where that term is the major focus of the article. The term is added to the search builder will be followed by [MAJR] (e.g. **“Neoplasms” [MAJR]**)

Subheadings (Qualifiers)

Subheadings help describe more completely a particular aspect of a topic. In the MeSH database, subheadings logically paired with the main heading are presented. Check the appropriate box(es), then use the **Add to Search Builder** button with **OR** to build a search.

Subheadings:

| | |
|---|--|
| <input checked="" type="checkbox"/> analysis | <input checked="" type="checkbox"/> epidemiology |
| <input type="checkbox"/> antagonists and inhibitors | <input type="checkbox"/> ethnology |
| | <input type="checkbox"/> etiology |

In this example, the search would include: (“Neoplasms/analysis”[MeSH] OR “Neoplasms/epidemiology”[MeSH])