Oklahoma Osteopathic Association

Tandy Grand Opening CME

Melissa A. Gastorf, DO, FACOFP
Program Chair

Joseph R. Johnson, DO, FACOOG
Program Vice Chair

September 29 - October 1, 2017 | OSU Center for Health Sciences

Program Approved for
17 Category 1-A Credits from the AOA

Program Pending Approval for
up to 17 Prescribed Credits from the AAFP
# Tandy Grand Opening Jubilee & CME

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### Friday, September 29, 2017

- Evaluation of the Hip - What Primary Care Needs to Know for Successful Endoscopic Treatment
- Bugs & Drugs - Why it Matters
- Treatment of Vulvar Abscesses - An STI Update

### Saturday, September 30, 2017

- Education for the Next Generation of Osteopathic Physicians
- Cherokee Nation HCV Program: From Evaluation to Cure to Elimination
- Enhanced Recover After Surgery (E.R.A.S.)
- Pediatric Obesity - Curbing An Epidemic with ECHO
- Proper Prescribing: Investigation & Prosecution of (Im) Proper Prescribing
- Pediatric Emergencies: A Primary Care Crisis
- HIV in Oklahoma - Making a Difference
- Diabetic Recognition & Management for the Rural Physician
- Difficult to Treat Hypertension
- Differential Edema of the Legs

### Sunday, October 1, 2017

- Using Simulation to Enhance Medical Education
- A History of Systemic Thrombolysis for Stroke: Can We Trust the Clinical Guidelines?
- Obstetrical Emergencies - What We Know
- Addiction - Changing Our Aspect of Practice
The mission of the Oklahoma Osteopathic Association is to advocate for the osteopathic profession and promote the health and well being of all Oklahomans.

Tandy Grand Opening Jubilee & CME
September 29 - October 1, 2017
Oklahoma State University Center for Health Sciences
Tulsa, Oklahoma

Mission Statement
The mission of the Oklahoma Osteopathic Association is to advocate for the osteopathic profession and promote the health and well being of all Oklahomans.

Program Attendee Notice
Thank you for your continued support of our continuing medical education (CME) offerings. Please feel free to contact our staff representatives to resolve any problems you may have regarding facilities, handouts, program contents, etc. Should you have concerns about the program’s compliance with the American Osteopathic Association (AOA) Uniform Guidelines, please express these concerns to Lana G. Ivy, MBA, CFRE, CEO/Executive Director, Oklahoma Osteopathic Association. For any unresolved issues regarding compliance with the AOA Uniform Guidelines, you may contact the AOA Division of CME at 142 E. Ontario Street, Chicago, IL 60611, 800-621-1773.

How Speakers and Topics Are Selected
The Oklahoma Osteopathic Association’s Bureau on Continuing Medical Education meets twice annually to choose seminar chairs, topics of interest, and the best presenters available to speak on each chosen topic. In addition, past program evaluations are used in determining speakers and topics from past conferences.

Grievance Policy
Program grievances will be presented to the Oklahoma Osteopathic Association Board of Trustees and dealt with appropriately. If this action did not resolve the problem to satisfaction, the person with the grievance will be directed to the American Osteopathic Association’s Division of Continuing Medical Education.

Commercial Exhibit Area
All exhibit areas are arranged in a separate room adjacent to the conference meeting room. In some instances, foyer space is utilized for spillover when needed. Exhibit booths are reserved by the Oklahoma Osteopathic Association and are available on a first-come first-serve basis. Exhibit space is assigned in some instances, i.e., near the door for book sales, near electrical outlets for those exhibits that need electricity.
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Professional Program Needs Assessment
Medicine is not a stagnant practice, new and improved treatments and guidelines evolve in an effort to provide the best treatment to our patients. As physicians, it’s our duty to keep our practices up-to-date for the benefit of our patients.

Program Objectives
Upon completion of this program, physicians will be updated on new recommendations and guidelines on a variety of topics that benefits all specialties.
For Immediate Release
Contact: Lana G. Ivy, MBA, CFRE, CEO/Executive Director
405-528-4848
lana@okosteo.org

Dr. ___________________________ of ___________________________ attended the continuing medical education seminar entitled Tandy Grand Opening Jubilee & CME sponsored by the Oklahoma Osteopathic Association (OOA). Osteopathic physicians (DOs) from across the state convened on September 29 - October 1, 2017 in Tulsa, Oklahoma, at the Oklahoma State University Center for Health Sciences for the educational seminar.

The OOA recognizes medicine is not a stagnant practice, new and improved treatments and guidelines evolve in an effort to provide the best treatment to our patients. As physicians, it’s our duty to keep our practices up-to-date for the benefit of our patients. The mission of the OOA is not only to advocate for the osteopathic profession but also to promote the health and well-being of all Oklahomans. It is the OOA’s goal to educate, engage and empower physicians to make a direct impact on Oklahoma.

The Oklahoma Osteopathic Association serves more than 2,000 members, including practicing physicians, residents, interns, osteopathic medical students and retired physicians. Doctors of osteopathic medicine, or DOs, practice in 68 of Oklahoma’s 77 counties and in 144 Oklahoma communities. Oklahoma DOs practice in all areas of medicine from neurology to sports medicine to radiology. DOs complete four years of medical training and continue their education in postgraduate internships and residencies. As complete physicians, DOs are able to prescribe medication and perform surgery. In addition, DOs have added training in osteopathic manipulative medicine, a hands-on treatment tool they can use to diagnose and treat injuries or illnesses. OMM can be used in conjunction with, and sometimes in place of, medication or surgery to restore mobility and function. For more information about Oklahoma DOs, visit the Oklahoma Osteopathic Association’s website at www.okosteo.org.
Seminar Presenters

Hal D. Martin, DO began his osteopathic journey when he graduated from Oklahoma State University in 1982, majoring in Pre-Med. After he earned his Doctor of Osteopathic Medicine degree from OSU College of Osteopathic Medicine, Dr. Martin completed his orthopedic surgery internship and residency in Ohio and Massachusetts. Board certified in orthopedic surgery, Dr. Martin has traveled the globe sharing his knowledge in sports medicine and hip disorders. Dr. Martin currently practices at the Baylor University Medical Center’s Hip Preservation Center in Dallas, Texas.

Jeffrey S. Stroup, Pharm D, FCCP, BCPS received his Doctor of Pharmacy from the Albany College of Pharmacy in Albany, New York in 2002 and completed his residency in endocrinology/adult medicine in the Department of Pharmacy Practice in Albany. Dr. Stroup is currently a professor of internal medicine and interim vice president for strategy at the Oklahoma State University Center for Health Sciences. He is also the chief operating officer of the OSU Medical Authority and Trust that oversees the OSU Medical Center. Dr. Stroup is an active researcher and frequent lecturer on diabetes, antimicrobials, and many other topics.

Daniel Oraee, DO earned is Doctor of Osteopathic Medicine degree from Touro University of Nevada College of Osteopathic Medicine in 2012 and through his community service, he became a T.O.U.C.H award recipient. Upon graduation, he continued his education through Oklahoma State University Medical Center’s obstetrics and gynecology residency program. Dr. Oraee is currently the Clinical Clerkship Coordinator and Assistant Clinical Professor of Obstetrics and Gynecology at Oklahoma State University.

Alissa P. Craft, DO, MBA graduated from the Kirksville College of Osteopathic Medicine in Kirksville, MO in 1992. She then completed a pediatric residency at Phoenix Children’s Hospital in Phoenix, AZ and a fellowship in neonatal perinatal medicine at the University of California, San Diego. From August 2015 – May 2017, Dr. Craft served as the Vice President of Accreditation at the American Osteopathic Association. In this role, she serves as Secretary for the Commission on Osteopathic College Accreditation (COCA), the only accrediting agency for the 40 plus training locations for doctors of osteopathic medicine in the United States. Prior to joining the American Osteopathic Association, Dr. Craft served as Associate Dean for Academic Affairs at the New York Institute of Technology College of Osteopathic Medicine and Director of Assessment and Accreditation for the College of Osteopathic Medicine of the Pacific. She also served as a member of the COCA.

Jorge G. Mera, MD is the director of infectious diseases for the Cherokee Nation Health Services (CNHS), the largest tribally operated health care system in the United States. During the last years his efforts have been dedicated to organizing the Cherokee Nation HCV elimination program as well as the HIV/HCV Extended Care Health Outcomes project (project ECHO) in the tribe. He is also the Director the CNHS HIV clinic since 2012 and the Director of the only Native American AETC local performance site in Oklahoma since 2013. Dr. Mera completed his fellowship in Infectious Disease and Clinical Microbiology at Baylor College of Medicine in Houston, Texas and is Board Certified by the American Board of Internal Medicine in Infectious Diseases. He is a clinical assistant professor in the department of internal medicine of the Oklahoma State University Health Science Center.
Brad A. White, DO graduated in 2007 where he earned his Doctor of Osteopathic Medicine degree from the Oklahoma State University College of Osteopathic Medicine. After graduation, Dr. White performed his internship and anesthesiology residency at the Oklahoma State University Medical Center. Board certified in anesthesiology, Dr. White shares his knowledge with future anesthesiologists as the anesthesiology residency program director at OSU Medical Center and an assistant clinical professor of anesthesiology at OSU Center for Health Sciences.

David Michael King, DO, FACOP, FAAP started his osteopathic career when he graduated from the Oklahoma State University College of Osteopathic Medicine in 2004. After completing his fast track pediatric internship and his pediatric and OMM residencies, Dr. King moved to Wisconsin to practice pediatrics. Two years later, Dr. King found a home in Guymon, Oklahoma, at Memorial Hospital of Texas County where he is the chief of staff and a pediatrician.

Duane G. Koehler, DO, FACOFP earned an associate degree in emergency medical technology from the University of Arkansas for Medical Sciences, completed his Bachelor of Science degree in health science from the University of Tulsa and earned his Doctor of Osteopathy degree from Oklahoma State University College. He also held the State Paramedic Certification in Emergency Medical Technology in Arkansas, working as a Registered EMT-Paramedic throughout his medical studies. Dr. Koehler is currently an adjunct clinical faculty member with OSU-COM and Department of Rural Health clinical assistant professor. He is a past president of the Oklahoma Osteopathic Association and is the president-elect of the American College of Osteopathic Family Physicians.

Jeremy L. Jones, DO, FACOP graduated from the Oklahoma State University College of Osteopathic Medicine in 2008. Board certified in pediatrics, Dr. Jones has an interest pediatric asthma, attention deficit hyperactivity disorder, immunizations, slow-transit constipation and atopic dermatitis. Dr. Jones currently practices at the OSU Pediatric Clinic in Tulsa, Oklahoma. When Dr. Jones is not at work, he enjoys listening to his wife Kayla play classical piano and spending time with his three daughters.

Madhuri J. Lad, DO, FACOI, AAHVM graduated tenth, out of 85, in her 2004 graduating class from the Oklahoma State University College of Osteopathic Medicine. Board certified in internal medicine and an HIV specialist, Dr. Lad is a clinical assistant professor in the Department of Internal Medicine at OSU Center for Health Sciences. In Dr. Lad’s spare time, she enjoys scrapbooking, photography, travel, interior design, cooking, and conducting presentations. She is a district and state award winner for her cooking and nutrition presentations.

Douglas C. Nolan, DO, FACOFP earned his Doctor of Osteopathic Medicine degree from the Oklahoma State University College of Osteopathic Medicine in 2000. He completed his internship from the Tulsa Regional Medical Center in 2001 and his family practice residency from OSU in 2003. Dr. Nolan is the program director/director of medical education for the Tahlequah City Hospital Family Practice Residency, associate dean for rural and tribal medicine for OSU-COM, hospital medical director for the Cherokee Nation Hasting Hospital, and diabetes program medical director for the Cherokee Nation Health Services.

Kenneth E. Calabrese, DO, MACOI is a 1970 graduate of the Kansas City College of Osteopath-
ic Medicine and Surgery. After completing his rotating internship at Lakeside Hospital, he entered the internal medicine residency program at Oklahoma Osteopathic Hospital, now OSU Medical Center. In 1977, he completed a nephrology and hypertension fellowship at the Cleveland Clinic and returned to OSU Medical Center to begin his practice and develop end stage renal dialysis services for the hospital. A board-certified internist and nephrologist, Dr. Calabrese is a member of the American College of Osteopathic Internists Gillum Society of Master Fellows. Dr. Calabrese is currently the president of the Oklahoma Osteopathic Association.

Parker K. Truong, DO earned his Doctor of Osteopathic Medicine degree from the Oklahoma State University College of Osteopathic Medicine in 2005. After an internal medicine residency at the University of Oklahoma Health Sciences Center in Oklahoma City, he completed fellowships in cardiology and interventional cardiology at OSU Medical Center. Board certified in cardiology, internal medicine, interventional cardiology, nuclear cardiology and adult echocardiography, Dr. Truong has been with Oklahoma Heart Hospital Physicians in Oklahoma City since 2012. He is a member of the Oklahoma Osteopathic Association, American Osteopathic Association and the American College of Cardiology.

Sarah White, NRP, CHSOS, is a Simulation Specialist and Educator at Oklahoma State Center for Health Sciences. She’s the first Certified Healthcare Simulation Specialist in the State of Oklahoma recognized by the Society for Simulation in Healthcare. She is a Nationally Registered Paramedic with more than 22 years’ experience in the field. She currently serves as a National Registry master level skills exam evaluator as well as the AHA Training Coordinator for OSU Center for Health Sciences student and residency programs.

Aaron Q. Lane, DO earned is Doctor of Osteopathic Medicine degree from the Oklahoma State University College of Osteopathic Medicine in 2002. He then completed his traditional rotating internship at St. Anthony Hospital in 2003 and his emergency medicine residency from INTEGRIS Southwest Medical Center in 2006. Dr. Lane traveled back north to become a clinical assistant professor of emergency medicine and emergency medicine clerkship director at the Oklahoma State University Medical Center.

Corey R. Babb, DO, FAOOG, IF earned his bachelor of arts, music composition, from Denison University in Granville, Ohio in 2004. From there, Dr. Babb received his Doctor of Osteopathic Medicine degree from the Oklahoma State University College of Osteopathic Medicine in 2008. After completing his obstetrics and gynecology internship and residency, Dr. Babb stayed in Tulsa to become an adjunct professor for OSU-COM’s Department of Osteopathic Manipulative Medicine, a laborist at Saint Francis Hospital, and an OB/GYN clinical assistant professor for OSU-COM.

Natasha N. Bray, DO, MSEd, FACOI, FACP earned her Doctor of Osteopathy from Oklahoma State University College of Osteopathic Medicine. Dr. Bray went onto the Philadelphia College of Osteopathic Medicine and completed her internship as the Chief Intern Physician and completed her residency at Cambridge Health Alliance/Harvard Affiliated Hospital. Dr. Bray is currently an internal medicine clinical assistant professor of rural health for Oklahoma State University College of Osteopathic Medicine in Tulsa, Oklahoma and a contract physician for the Choctaw Nation Health Services Authority.
TANDY GRAND OPENING CME

OKLAHOMA OSTEOPATHIC ASSOCIATION

MELISSA A. GASTORF, DO, FACOFP
PROGRAM CHAIR

JOSEPH R. JOHNSON, DO, FACOOG
PROGRAM VICE CHAIR

FRIDAY, SEPTEMBER 29, 2017

10:30 - 10:50 AM  TANDY BUILDING RIBBON CUTTING & DEDICATION (ALL INVITED)

NOON - 2 PM  LUNCH / PROPER PRESCRIBING
"INVESTIGATION & PROSECUTION OF (IN)PROPER PRESCRIBING"
Duane G. Koehler, DO, FACOFP (certified family practice, Tulsa, OK)

NOON - 1 PM  "PROPER PRESCRIBING"

11 AM - NOON  RECEPTION WITH SANJEEV ARORA, MD, FACP, MACP (ALL INVITED)

2 - 3 PM  "EVALUATION OF THE HIP - WHAT PRIMARY CARE NEEDS TO KNOW FOR SUCCESSFUL ENDOSCOPIC TREATMENT"
Hal D. Martin, DO (certified orthopedic surgery, Dallas, TX)

NOON - 2 PM  "PEDIATRIC EMERGENCIES: A PRIMARY CARE CRISIS"
Jeremy Jones, DO, FACOP (certified pediatrics, Tulsa, OK)

NOON - 2 PM  "HIV IN OKLAHOMA - MAKING A DIFFERENCE"
Madhuri J. Lad, DO, COAI, AAHIVM (certified internal medicine, Tulsa, OK)

11 AM - NOON  "DIFFICULT TO TREAT HYPERTENSION"
Kenneth E. Calabrese, DO, MACOI (certified internal medicine & nephrology, Tulsa, OK)

11 AM - NOON  "DIFFERENTIAL EDEMA OF THE LEGS"
Parker K. Truong, DO (certified interventional cardiology & nuclear medicine & echocardiography, Oklahoma City, OK)

8 - 9 AM  "USING SIMULATION TO ENHANCE MEDICAL EDUCATION"
Sarah White, NRP, CHSOS (simulation specialist, Tulsa OK)

9 - 10 AM  "CHEROKEE NATION HCV PROGRAM: FROM EVALUATION TO CURE TO ELIMINATION"
Jorge R. Mera, MD (certified internal medicine & infectious diseases, Tahlequah, OK)

9 - 10 AM  "EMERGENCY MYTH BUSTERS - THE CHALLENGE OF GUIDELINES"
Aaron Q. Lane, DO (certified emergency medicine, Tulsa, OK)

10 - 11 AM  "ENHANCED RECOVERY AFTER SURGERY (E.R.A.S.)"
Brad A. White, DO (certified anesthesiology, Tulsa, OK)

10 - 11 AM  "OBSTETRICAL EMERGENCIES - WHAT WE KNOW"
Corey R. Babb, DO, FACOOG, IF (certified obstetrics & gynecology, Tulsa, OK)

11 AM - NOON  "PEDIATRIC OBESITY - CURBING AN EPIDEMIC WITH ECHO"
David M. King, DO, FACOP, FAAP (certified pediatrics, Guymon, OK)

11 AM - NOON  "ADDITION - CHANGING OUR ASPECT OF PRACTICE"
Natasha N. Bray, DO, MSEd, FACOI, FACP (certified internal medicine, Tahlequah, OK)

SATURDAY, SEPTEMBER 30, 2017

8 - 9 AM  "EDUCATION FOR THE NEXT GENERATION OF OSTEOPATHIC PHYSICIANS"
Alissa P. Craft, DO, MBA (certified pediatrics, Phoenix, AZ)

9 - 10 AM  "CHEROKEE NATION HCV PROGRAM: FROM EVALUATION TO CURE TO ELIMINATION"
Jorge R. Mera, MD (certified internal medicine & infectious diseases, Tahlequah, OK)

10 - 11 AM  "ENHANCED RECOVERY AFTER SURGERY (E.R.A.S.)"
Brad A. White, DO (certified anesthesiology, Tulsa, OK)

11 AM - NOON  "PEDIATRIC OBESITY - CURBING AN EPIDEMIC WITH ECHO"
David M. King, DO, FACOP, FAAP (certified pediatrics, Guymon, OK)

11 AM - NOON  "OBSTETRICAL EMERGENCIES - WHAT WE KNOW"
Corey R. Babb, DO, FACOOG, IF (certified obstetrics & gynecology, Tulsa, OK)

SUNDAY, OCTOBER 1, 2017

8 - 9 AM  "USING SIMULATION TO ENHANCE MEDICAL EDUCATION"
Sarah White, NRP, CHSOS (simulation specialist, Tulsa OK)

9 - 10 AM  "EMERGENCY MYTH BUSTERS - THE CHALLENGE OF GUIDELINES"
Aaron Q. Lane, DO (certified emergency medicine, Tulsa, OK)

10 - 11 AM  "OBSTETRICAL EMERGENCIES - WHAT WE KNOW"
Corey R. Babb, DO, FACOOG, IF (certified obstetrics & gynecology, Tulsa, OK)

11 AM - NOON  "ADDITION - CHANGING OUR ASPECT OF PRACTICE"
Natasha N. Bray, DO, MSEd, FACOI, FACP (certified internal medicine, Tahlequah, OK)
Bugs and Drugs

Jeff Stroup, Pharm.D., FCCP, BCPS
Professor of Medicine
Oklahoma State University Center for Health Sciences

Bad Bugs, No Drugs

- Declining research investments in antimicrobial development
- The Antimicrobial Availability Task Force of the IDSA identified problematic pathogens including gram-negative bacteria
- Problematic pathogens can “escape” the activity of antibacterial drugs
  - “ESKAPE” pathogens include
    - Escherichia coli
    - Staphylococcus aureus
    - Klebsiella pneumoniae
    - Acinetobacter baumannii
    - Pseudomonas aeruginosa
    - Enterobacter spp

Review of Gram Stains

Gram Stains

Gram Positive Cocci (GPC)

- Pairs, Chains, Clusters
  - *staphylococcus*
- Pairs, Chains
  - *streptococcus*
  - *enterococcus*
- Pairs (lancet-shaped)
  - *streptococcus pneumoniae*
- Pairs
  - *enterococcus*
Gram Stains

Gram Positive Cocci (GPC)

- Catalase positive
  - staphylococcus
    - Coagulase positive
      - S. aureus
    - Coagulase negative
      - S. epidermidis
      - S. saprophyticus

- Catalase negative
  - streptococcus
  - enterococcus
  - micrococcus

Gram Stains

Gram Positive Bacilli (GPB)

- Diphtheroids
  - (small pleomorphic)
    - corynebacterium

- Large, with spores
  - clostridium
  - bacillus

- Branching, beaded
  - nocardia
  - actinomyces

- Other
  - listeria
  - lactobacillus
Gram Stains

Gram Negative Cocci (GNC)

- Diploccci (pairs)
  - *neisseria meningitidis*
  - *neisseria gonorrhoeae*
  - *moraxella catarrhalis*

- Other
  - *acinetobacter*

Gram Stains

Gram Negative Bacilli (GNB)

- Enterobacteriaceae
  - *escherichia coli*
  - *klebsiella pneumoniae*
  - *enterobacter*
  - *citrobacter*
  - *serratia*

- Lactose positive
  - *escherichia coli*
  - *klebsiella pneumoniae*
  - *enterobacter*
  - *citrobacter*
Gram Stains

Gram Negative Bacilli (GNB)

- Lactose negative / oxidase negative
  - *proteus mirabilis*
  - *providencia*
  - *morganella*
  - *serratia*
  - *salmonella*
  - *shigella*
  - *acinetobacter*
  - *stenotrophomonas*

- Lactose negative / oxidase positive
  - *pseudomonas*
  - *aeromonas*
  - *burkholderia*

Gram Stains

Anaerobes

- GPC
  - *peptostreptococcus*

- GPB
  - *propionibacterium*
  - *clostridium*
  - *actinomyces*
  - *lactobacillus*
  - *bifidobacterium*

- GNC
  - *veillonella*

- GNB
  - *bacteroides*
  - *fusobacterium*
Penicillins

- MOA: inhibition of bacterial cell wall synthesis and activation of endogenous autolytic system
- Bacteriocidal
- Time dependent killers (T > MIC)
- Adverse effects: Anaphylaxis, seizures, interstitial nephritis, diarrhea, thrombocytopenia, Jarisch-Herxheimer reactions
**Penicillins: Penicillin G**

- **PCN G IV** 8-24 million units/day (divided Q4)
  - Gram positive aerobic cocci
    - *Strep A, B, C, G*
  - Gram negative aerobes
    - *Neisseria meningitidis*
  - Spirochetes / Anaerobes
    - *Treponema pallidum / clostridium*

* Also procaine(IM) and benzathine(IM) PCN
**2mEq Na + 1.7mEq K per 1 million unit (dependent upon salt used)
***PCN VK 500mg po qid

**Other Penicillins**

- **Aminopenicillins**
  - Coverage: enterococcus / listeria
  - Ampicillin IV q 4-6 hours
- **Antistaphylococcal Penicillins**
  - Coverage: staphylococcus (MSSA)
  - Nafcillin (IV) 500 mg – 2 grams Q4-6
  - Oxacillin (IV) 500 mg – 2 grams Q4-6
  - Dicloxacillin (Dynapen®) 250 – 500 mg po Q6
- **Extended Spectrum Penicillins**
  - Coverage: gram negative bacilli
  - Ticarcillin (Ticar®) 3 grams IV Q 4
  - Piperacillin (Pipracil®) 3-4 grams IV Q 4-6
Penicillin Combinations

- PCN + B-lactamase inhibitor combinations
  - **Extended gram negative coverage + anaerobes**
  - Ampicillin / sulbactam (Unasyn®)
    - Dose 1.5 – 3 grams IV Q 6h
  - Ticarcillin / clavulanic acid (Timentin®)
    - Dose 3.1 grams IV Q 4-6 h
  - Piperacillin / tazobactam (Zosyn®)
    - Dose 3.375 grams IV Q 6h or 4.5g IV q8h
    - Dose 4.5 grams IV Q 6h in combination with an aminoglycoside for suspected pseudomonal infections
  - **Also amoxicillin/clavulanic acid 250-875mg po bid

Cephalosporins

- Bacteriocidal (time dependent killers)
- MOA: Inhibits bacterial wall synthesis
- PCN cross reactivity 5-15%
- Majority are renally eliminated
- Adverse Events include:
  - Seizures
  - C.diff.
  - Clotting abnormalities
Cephalosporins
First Generation

- Cefazolin (Ancef®, Kefzol®) 1-2 grams IV q8h
  - Gram positive coverage
    - *Streptococcus, Staphylococcus*
  - Gram negative coverage
    - *Proteus, E.Coli, Klebsiella (PEK)*

Also cephalexin, cefadroxil, cephadrine

Cephalosporins
Second Generation

- Cefuroxime (Zinacef®) 750-1500mg IV q8h
  - Gram positive coverage
    - *Streptococcus, Staphylococcus*
  - Gram negative coverage
    - *H.Influenza, Enterobacter, Neisseria (HEN-PEK)*
  - “Above the belt” Lung Infections
  - Also cefaclor, cefprozil, loracarbef
Cephalosporins
Second Generation

- Cefotetan (Cefotan®) 1-2 grams IV q12h
  - Clinically not as effective for gram positive organisms
  - Gram negative coverage (same as cefuroxime)
  - Anaerobic coverage: *B. fragilis*
  - “Below the belt”- abdominal infections
  - Watch for s/s of bleeding, hemolytic anemia

Also cefoxitin (Mefoxin®) 1-2 g IV q6-8h

Cephalosporins
Third Generation

- Ceftriaxone (Rocephin®) 1-2 grams IV q24h
  - Dose q 12h for meningitis
  - No renal adjustment
  - May inhibit bile outflow (induces biliary sludging)
- Cefotaxime (Claforan®) 1-2 grams IV q6-8h
  - Gram positive coverage
    - *Streptococcus* (not *staphylococcus*)
  - Gram negative coverage enhanced
    - *Enterobacter, Serratia, Citrobacter*
    - These do not cover *Pseudomonas*
Other 3rd Generations

- Cefizoxime IV (Cefizox)
- Cefoperazone IV (Cefobid)
- Cefditoren (Spectracef)
- Cefixime (Suprax)
- Cefpodoxime (Vantin)
- Ceftibuten (Cedax)
- Cefdinir (Omnicef)

Cephalosporins
Third Generation

- Ceftazidime (Fortaz®) 1-2 grams IV q8h
  - Gram positive coverage
  - Little or no coverage against these organisms
  - Gram negative coverage
    - Add Pseudomonas
Cephalosporins
Fourth Generation

- Cefepime (Maxipime®) 1-2 grams IV q12h
  - Gram positive coverage
    - *Staph* and *Strep*
  - Gram negative coverage
    - Including *Pseudomonas*

*Better staph, enterobacter, klebsiella than ceftazidime*
Other Cephalosporins

- Ceftaroline (Teflaro®)
- Broad spectrum cephalosporin with MRSA activity
  - No pseudomonal coverage
- Indicated for CAP and CSSTI
- IV only
- Dosing 600mg IV q 12h
- ADRs: nausea, increased Coombs positivity
- Benefits: no monitoring, cost versus “newer” MRSA agents

Cephalosporins

- In general NO coverage against:
  - Atypical Organisms
  - *Enterococcus*
  - Ceftaroline*
  - Listeria
Ceftolozane/Tazobactam

- Zerbaxa (Approved 12/19/14)
- Fifth generation cephalosporin
- Indication: complicated IAI (with metronidazole); UTI including pyelonephritis
- Coverage: pseudomonas, enterobacteriaceae (some ESBL, lacks carbapenemase), strep, bacteroides
- ADRs: hypersensitivity, pyrexia
- Dose: 1.5 grams every 8 hours
  - Renal adjustment

Ceftazidime / Avibactam

- Avycaz (Approved 2/25/15)
- Third generation cephalosporin
- Indication: complicated IAI (with metronidazole); UTI including pyelonephritis
- Coverage: pseudomonas, enterobacteriaceae (some ESBL and carbapenemase), limited gram positive and anaerobic coverage
- ADRs: hypersensitivity, CNS reactions
- Dose: 2.5 grams every 8 hours (infused over 2 hours)
  - Renal adjustment
Other Antibiotics

- **Azithromycin/Clarithromycin**
  - Strep/Atypical/MAC

- **Clindamycin**
  - Strep/Staph (D-Test)/Anaerobes

- **Metronidazole**
  - Protozoans/Aнаerobes/C.Diff

- **Sulfamethoxazole/Trimethoprim**
  - Staph/PJP/UTI

- **Rifampin**
  - Combo hardware infections

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**Doxycycline**

- Doxycycline (Vibramycin®) 100mg IV q12h
  - MOA: binds to the 30S ribosomal subunit
  - Gram positive coverage
    - *S.pneumoniae*
  - Gram negative coverage
    - *N.meningitidis, E.coli, M.catarrhalis, H.influenza*
  - Atypicals, rickettsia, borrelia, and chlamydia
  - Do not use in children, watch sun exposure
Minocycline

- Minocin IV
- Acinetobacter coverage
- **FDA Indication:** MINOCIN® (minocycline) for Injection is indicated for the treatment of infections due to susceptible isolates of designated microorganisms, including *Acinetobacter* species bacteria.
- **Dosage:** 200mg IV x 1 then 100mg IV q 12 hours

Tigecycline (Tygacil®)

- A glycyclcycline that inhibits protein translocation by binding to the 30S ribosome
- Indicated for complicated skin and intra-abdominal infections
- Active versus gram(+) including MRSA, gram (-), and anaerobes.
- **ADRs:** Nausea (29.5%), vomiting (19.5%)
- **Dose:** 100 mg IV x1, then 50mg IV q 12h
- **Dose adjustment with liver disease (Child Pugh class C)**
  - 100mg IV x 1, then 25mg IV q 12h
- **Niche:** ?
Aminoglycosides

MOA: inhibition of bacterial protein synthesis, bacteriocidal, concentration dependent with large PAE

- Gram + cocci (w/β-lactam antibiotic)
- Gram – bacilli
- Listeria monocytogenes (a gram+ bacilli) (w/ampicillin)

- ADRs: renal tubular necrosis, cochlear and vestibular damage

- Dosing: Once daily dosing, multiple daily dosing (traditional), synergy dosing

- Monitoring: Peak + Trough versus Hartford Nomogram
# Aminoglycoside comparison

<table>
<thead>
<tr>
<th>DRUG</th>
<th>DOSE (OD)</th>
<th>DOSE (MDD)</th>
<th>Peak (OD/MD)</th>
<th>Trough (OD/MD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENTAMICIN</td>
<td>5mg/kg</td>
<td>1.7mg/kg q 8h</td>
<td>16-24/4-10</td>
<td>&lt;1 / 1-2</td>
</tr>
<tr>
<td></td>
<td>(7mg/kg) if critically ill</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOBRAMYCIN</td>
<td>5mg/kg</td>
<td>1.7mg/kg q 8h</td>
<td>16-24/4-10</td>
<td>&lt;1 / 1-2</td>
</tr>
<tr>
<td></td>
<td>(7mg/kg) if critically ill</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AMIKACIN</td>
<td>15mg/kg</td>
<td>7.5mg/kg q 12h</td>
<td>56-64/15-30</td>
<td>&lt;1 / 5-10</td>
</tr>
</tbody>
</table>

## Hartford Nomogram

![Hartford Nomogram](image_url)
Vancomycin

- MOA: inhibition of bacterial cell wall synthesis
  - Excellent gram (+) coverage (MRSA)
  - Used for c. difficile 125mg po q6h
  - Redman’s syndrome, ototoxicity, nephrotoxicity
  - Dosing: 1g q 12 versus 15mg/kg q 12
  - Monitoring: Peak or Trough or both or neither?
  - Trough goals: none vs. 10-15 vs. 15-20

Therapeutic monitoring of vancomycin in adult patients: A consensus review of the American Society of Health-System Pharmacists, the Infectious Diseases Society of America, and the Society of Infectious Diseases Pharmacists

Micheal Rybak, Ben Lomaestro, John C. Rotschafer, Robert Moellering JR., William Craig, Marianne Biletter, Joseph. R. Dalovino, and Donald P. Levine

*Am J Health Syst Pharm. 2006;63:82-98.*
Mississippi Mud

Quinolones

- MOA: inhibits DNA gyrase and topoisomerase
  - Gram + cocci
  - Gram – cocci
  - Gram – bacilli

- ADRs: headache, tremors, restlessness, glucose abnormalities, QT prolongation?
- DI: warfarin, theophylline, cations, sucralfate, binding resins, antiarrythmics?
# Quinolone Comparison

<table>
<thead>
<tr>
<th>Generic</th>
<th>Brand</th>
<th>IV Dosing</th>
<th>Oral Dosing</th>
<th>Renal Adjustment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ciprofloxacin</td>
<td>Cipro</td>
<td>200-400mg q 12</td>
<td>500-750mg q 12</td>
<td>YES</td>
</tr>
<tr>
<td>Levofloxacin</td>
<td>Levaquin</td>
<td>500-750mg qd</td>
<td>500-750mg qd</td>
<td>YES</td>
</tr>
<tr>
<td>Moxifloxacin</td>
<td>Avelox</td>
<td>400mg qd</td>
<td>400mg qd</td>
<td>NO</td>
</tr>
<tr>
<td>Gemifloxacin</td>
<td>Factive</td>
<td>NONE</td>
<td>320mg qd</td>
<td>YES</td>
</tr>
</tbody>
</table>
Delafloxacin

- Baxdela (approved June 19, 2017)
- Fluoroquinolone
- Indications: ABSSSI
- Coverage: MSSA, MRSA, Pseudomonas
- Dosage:
  - 300mg IV q 12 hours
  - 450mg po q 12 hours
  - Not recommended for eGFR <15 or ESRD
**Carbapenems**

- MOA: bind to bacterial peptidases and PBPs, inhibit cell wall synthesis
  - Gram + cocci
  - Gram – bacilli
  - Anaerobes
- ADRs: seizures (1.5%), diarrhea, drug fever.
- Drugs/Doses:
  - Ertapenem 1g q 24h
  - Imipenem 500mg q 6h
  - Meropenem 1g q 8h
  - Doripenem 500mg IV q8h

**Monobactam**

- MOA: binds to transpeptidases and PBPs, inhibition of cell wall synthesis
- Aztreonam: gram - coverage only
- ADRs: rash, diarrhea
- Dose: 1-2g IV q6-8 h

**safe in PCN allergic pts**

Niche: PCN/Ceph anaphylaxis needing pseudomonal coverage
**Colistin**

- Introduced in 1952; utilized until the early 1980’s
- **MOA:** binds to LPSs and phospholipids in the outer cell membrane of Gram-negative bacteria. It competitively displaces divalent cations (Ca²⁺ and Mg²⁺) from the phosphate groups of membrane lipids, which leads to disruption of the outer cell membrane, leakage of intracellular contents and bacterial death
- **Uses:** MDR acinetobacter, pseudomonas, KPCs
- **Problems:** neuro and nephrotoxicity
- **Dosage:** Colistin methanesulfonate (CMS) 2.5–5 mg/kg (31,250–62,500 IU/kg) per day, divided into two to four equal doses.
- **Other Issues:** salts, combination therapy

**Quinupristin/Dalfopristin**

- **MOA:** act on bacterial ribosomes to inhibit protein synthesis
- **Coverage:** VRE, MRSA
- **ADRs:** infusion site reactions
- **Dose:** 7.5mg/kg IV q 8-12h
- **CYP450 3A4 inhibitor**
- **Rarely Utilized**
Linezolid

- MOA: Act on bacterial ribosomes to inhibit translocation
- Coverage: VRE, MRSA
- ADRs: myelosuppression, peripheral neuropathy
- DI's: SSRI (MAOI-B property)
- Dose: 600mg IV/po q 12h
- Pt assistance program!
  - 1-800-242-7014
- Higher incidence of use
**Tedizolid**

- Sivextro (Approved 6/20/14)
- MOA: bacteriostatic, act on bacterial ribosomes to inhibit translocation
- Indication: acute bacterial skin and skin structure infections (ABSSSIs)
- Coverage: gram positive including MRSA
- ADRs: GI, nausea, diarrhea, headache
- DIs: less MAOI compared to Linezolid
- Dose: 200mg IV or PO daily
  - No dosing adjustment

**Daptomycin**

- Cyclic lipopeptide
- MOA: rapid depolarization of bacterial membrane resulting in cell death
- Coverage: VRE, MRSA
- ADRs: increased LFTs + CPK
- Dose: 4-6mg/kg IV q 24h
  - Renal adjustment
- Niche: severe cellulitis, endocarditis, no pneumonia
Telavancin

- Lipoglycopeptide
- MOA: inhibits cell wall synthesis and also binds to the bacterial membrane
- Coverage: gram positive including MRSA
- ADRs: renal dysfunction, foamy urine, pregnancy warning
- Dose: 10mg/kg IV q 24h
  - Renal adjustment

Dalbavancin

- Dalvance (Approved 5/23/14)
- Lipoglycopeptide
- Indication: acute bacterial skin and skin structure infections (ABSSSIs)
- MOA: inhibits cell wall synthesis and also binds to the bacterial membrane
- Coverage: gram positive including MRSA, VRE, VISA
- ADRs: GI, headache, redman syndrome, ALT elevations)
- Dose: 1500mg IV x 1 OR 1000mg IV x 1, then 500mg IV x 1 (one week later)
  - Renal adjustment
  - 30 minute infusion
Oritavancin

- Orbactiv (Approved 8/6/14)
- Lipoglycopeptide
- Indication: acute bacterial skin and skin structure infections (ABSSSIs)
- MOA: inhibits cell wall synthesis and also binds to the bacterial membrane
- Coverage: gram positive including MRSA, VRE
- ADRs: nausea, vomiting, headache, diarrhea, ALT elevations
- DI: warfarin (concentrations may be increased)
- Dose: 1200 mg IV x 1 infused over 3 hours
  • No dosage adjustments

Brief Review Pseudomonal Coverage

- Beta Lactam
  • Piperacillin/tazobactam
  • Ceftazidime
  • Cefepime
  • Imipenem/Doripenem/ Meropenem
  • Ceftolozane/tazobactam
  • Ceftazidime/avibactam
- Aminoglycoside
  • Gentamicin/ Tobramycin/ Amikacin
- Fluoroquinolone
  • Ciprofloxacin/ Levofloxacin
- Monobactam
  • Aztreonam
**Brief “Serious” MRSA Infections**

- Vancomycin
- Daptomycin
- Linezolid
- Tedizolid
- Ceftaroline
- Tigecycline
- Telavancin/Oritavancin/Dalbavancin

**Brief Anaerobic Coverage**

- Penicillins
  - Piperacillin/tazobactam
  - Ampicillin/sulbactam
    - Amoxicillin/clavulanate
- Cephalosporins
  - Cefoxitin/Cefotetan
  - Ceftolozane/tazobactam
- Carbapenems
  - All (imipenem/ doripenem/ meropenem/ ertapenem)
- Metronidazole
- Fluoroquinolones
  - Moxifloxacin
- Clindamycin
- Tetracyclines
  - Tigecycline
**Antibiotic Problems**

Collateral Damage of Normal Flora
Antibiotic Fraggling

**Clostridium difficile**

<table>
<thead>
<tr>
<th>Clinical definition</th>
<th>Supportive clinical data</th>
<th>Recommended treatment</th>
<th>Strength of recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial episode, mild or moderate</td>
<td>Leukocytosis with a white blood cell count of 13,000 cells/µL or lower and a serum creatinine level less than 1.5 times the premorbid level</td>
<td>Metronidazole, 500 mg 3 times per day by mouth for 10-14 days</td>
<td>A-I</td>
</tr>
<tr>
<td>Initial episode, severe*</td>
<td>Leukocytosis with a white blood cell count of 15,000 cells/µL or higher or a serum creatinine level greater than or equal to 1.5 times the premorbid level</td>
<td>Vancomycin, 125 mg 4 times per day by mouth for 10-14 days</td>
<td>B-I</td>
</tr>
<tr>
<td>Initial episode, severe, complicated</td>
<td>Hypotension or shock, ileus, megacolien</td>
<td>Vancomycin, 500 mg 4 times per day by mouth or by nasogastric tube, plus metronidazole, 500 mg every 8 hours intravenously; If complete ileus, consider adding rectal instillation of vancomycin</td>
<td>C-III</td>
</tr>
<tr>
<td>First recurrence</td>
<td>...</td>
<td>Same as for initial episode</td>
<td>A-II</td>
</tr>
<tr>
<td>Second recurrence</td>
<td>...</td>
<td>Vancomycin in a tapered and/or pushed regimen</td>
<td>B-III</td>
</tr>
</tbody>
</table>

* The criteria proposed for defining severe or complicated CDI are based on expert opinion. These may need to be reviewed in the future upon publication of prospectively validated severity scores for patients with CDI.

**Tapered regimen** = 125 qid x 10-14d; 125 bid x 7d, 125 qd x 7d, 125 qod x 2-8 weeks
Bezlotoxumab is a fully human monoclonal antibody specific for exogenous toxin (toxin B).

**Bezlotoxumab: Mechanism of Action**

- Initial CDI episode, patient receives:
  - SoC antibiotics
  - BEZLO
- CDI resolves due to SoC antibiotics
- Outgrowth or newly-acquired *C. difficile* spores – risk of recurrence

- Systemic BEZLO enters gut lumen via paracellular transport, facilitated by toxin
- BEZLO blocks toxin binding to mucosal cells, prevents gut wall damage/inflammation
- Long half-life of BEZLO allows sustained toxin neutralization throughout at-risk recurrence period
- Gut microbiota recovers
**Fecal Microbiota Transplantation**

**Investigational New Drug Protocol**

The U.S. Food and Drug Administration (FDA) has classified human stool as a biological agent and determined that its use in fecal microbiota transplantation (FMT) therapy, and other research should be regulated to ensure patient safety. To use FMT to treat recurrent Clostridium difficile infection (CDI), an investigational new drug (IND) permit is required but is strongly encouraged and ultimately be required. To use IND for research or to treat any condition other than ACDI, an IND permit is required.

The FDA has released clarifying guidance in March 2016 and the OMB of Guidance for Industry. Entitlement Policy: Investigating Investigational New Drug Requirements for Use of Fecal Microbiota for Transplantation Treatment of Difficult to Cure Infections - Standard Therapies (SST) available for review. This guidance document has not been finalized by the FDA in accordance with the requirements of this protocol.

*Further Information and Resources for “known donors.”*

1. The donor must consent to the recipient to be supplied with a source of microbiota from a living donor who meets the microbiota donations.

Need help? Contact us:

---

**New Antimicrobial Stewardship Standard**

**Applies to Hospitals and Critical Access Hospitals**

**Effective January 1, 2017**

**Medication Management (NM)**

**Standard MM.08.04.01**

The [critical access] hospital has an antimicrobial stewardship program based on current scientific literature.

**Elements of Performance for MM.08.04.01**

1. Leaders establish antimicrobial stewardship as an organizational priority. (See also LD.01.03.01, EP 5)

   - **Note:** Examples of leadership commitment to an antimicrobial stewardship program are as follows:
     - Accountability documents
     - Budget plans

   - Infection prevention plans
   - Performance improvement plans
   - Strategic plans
   - Using the electronic health record to collect antimicrobial stewardship data

2. The [critical access] hospital educates, staff and licensed independent practitioners involved in antimicrobial ordering, dispensing, administration, and monitoring about antimicrobial resistance and antimicrobial stewardship practices. Education occurs upon hire or granting of initial privileges and periodically thereafter, based on organizational need.

3. The [critical access] hospital educates patients and their families as needed, regarding the appropriate use of antimicrobial medications, including antibiotics. (For more information on patient education, refer to Stan-

Continued on page 4
Meropenem-vaborbactam

Meropenem-vaborbactam, an investigational agent (formerly known as Carbavance®), is a combination of meropenem (a type of carbapenem) and the novel beta-lactamase inhibitor vaborbactam (formerly known as RPX7009). Meropenem-vaborbactam is being developed to treat serious gram-negative infections, such as cUTIs.
QUESTIONS?
Cherokee Nation HCV Program: From Evaluation to Cure to Elimination

Jorge Mera, MD, FACP
Whitney Essex, MSN, FNP-BC

Objectives

• Why is HCV a problem?
• Define elimination as it relates to infectious diseases
• Identify interventions required to achieve HCV elimination
• Describe the CNHS HCV Elimination program
Overview of Viral Hepatitis in the United States

- An estimated 3.5 million people are estimated to be living with HCV
- May be as high as 4.7 million

- Prescription opioid addiction is driving increases in heroin use and HBV, HCV, and HIV infection

- Only 9% of people living with HCV are cured

- HCV deaths continue to increase- most could have been prevented

Health Disparities in HCV

- More than half of people with HCV have lower income and education

- AI/AN have the highest rate of new HCV infections

- African Americans account for 25% of people with chronic HCV (but only 11% of the whole population)

- PLWHA
  - 1 in 4 people with HIV are coinfected, 1 in 2 among PLWHA

- PWID

- People who inject drugs
  - In 2014, estimated cause of 70% of new infections

- Incarcerated individuals
  - Estimated 33% of people with HCV have a history of incarceration

- Homeless people
  - Estimated 22-52% of homeless individuals have HCV
Increasing Deaths Due to Hepatitis C

More people are dying of HCV than all 60 other nationally notifiable infectious diseases combined.

Acute hepatitis C Incidence
USA, 2000 – 2013

What is driving the HCV epidemic today in the USA?

Source: National Notifiable Diseases Surveillance System (NNDSS)

Time Magazine, June 15, 2015
**Benefits of HCV Treatment**

- **Current treatments can cure >90% after 8-12 weeks**
  - Treatments work equally well in:
    - People who are coinfected with HIV
    - People of all races/ethnicities
    - People with moderate liver damage and other comorbidities
    - PWID that are engaged in MAT programs

- **Benefits:**
  - 73% reduction in liver cancer
  - 93% reduction in liver-related mortality

- **Impact:**
  - Prevention of 321,000 HCV deaths
  - Decreased HCV transmission to others
    - Networks of people who inject drugs
    - Women of childbearing age

---

**Stages of the HCV Continuum of Care**

- Only 9% of people living with HCV are CURED

---

Yehia et al, PLOS One, 2014
Considerations: Elimination

- National Academies of Sciences, Engineering and Medicine (formerly IOM)
  - Released report on April 11, 2016
  - Committee determined that:
    - Both hepatitis B and C could be rare diseases in the US
    - Considerable will and resources would be required to do this
  - Released report in April 2017 addresses what steps must be taken

*Decrease the incidence of HCV by 90% and mortality by 65% by the year 2030*
Discovery of HCV and Impact on HCV Incidence in US

22,000 cases of incident HCV infection reported in 2012

Definitions

• Control:
  − The reduction of disease incidence, prevalence, morbidity or mortality to a locally acceptable level as a result of deliberate efforts; continued intervention measures are required to maintain reduction. Example: diarrheal diseases

• Elimination:
  − Reduction to zero of the incidence of infection caused by a specific agent in a defined geographical area as a result of deliberate efforts; continued measures to prevent re-establishment of transmission are required. Example: measles, poliomyelitis.

• Eradication
  − Permanent reduction to zero of the worldwide incidence of infection caused by a specific agent as a result of deliberate efforts; intervention measures are no longer needed. Example: Smallpox

Miller M. et al. In Disease Control Priorities in Developing Countries: 2nd Edition 2006
Feasibility Criteria for Elimination

<table>
<thead>
<tr>
<th>In General¹</th>
<th>Hepatitis C Virus</th>
<th>Check list</th>
</tr>
</thead>
<tbody>
<tr>
<td>No non-human reservoir and the organism can not multiply in the environment</td>
<td>No human reservoir</td>
<td>✓</td>
</tr>
<tr>
<td>There are simple and accurate diagnostic tools</td>
<td>Serology widely available</td>
<td>✓</td>
</tr>
<tr>
<td>Practical interventions to interrupt transmission</td>
<td>Treatment as prevention Needle exchange programs Opioid substitution programs</td>
<td>✓</td>
</tr>
<tr>
<td>The infection can in most cases be cleared from the host</td>
<td>Treatment is 95 % curative</td>
<td>✓</td>
</tr>
</tbody>
</table>

1. Hopkins DR NEJM 2013. 368:1

Essential Goals to Eliminate HCV

- Prevent sequelae of advancing liver disease in those already infected
  - Baby Boomers, born 1945 -1965

- Prevent new or “incident” infections
  - Persons who inject drugs
  - Unsafe healthcare practices
  - Sexual exposures in Immunocompromised individuals
  - Women in child bearing age
    - To decrease maternal to child transmission
Cherokee Nation Jurisdiction

Sovereign Nation within a Nation

- 14 county area (over 9,200 sq mi.)
- Largest tribal operated health system (U.S.)
- Second largest Indian Nation in the U.S.
- 322,855 Registered citizens world-wide
- Medically serves 130,000 AI/AN

Cherokee Nation Health Services (CNHS)

- Rural area with high HCV prevalence
- 130,000 AI/AN
- 80,928 citizens ages 20 – 69
- HCV program since in 2012
  - ECHO model for delivery of HCV care
  - Clear pathways for medication procurement

Source: Cherokee Nation, 2017
CNHS HCV Clinic 2012-2014

- 262 HCV infected patients waiting to be treated
- Prevalence unknown, possibly 5.8%
- Possibly 3,285 patients!!!!!!

How do we increase screening?
How do we engage and treat more patients?

Hepatitis C Screening
Electronic Health Reminders Work!!!!!!

July 1, 2012 - June 30, 2013
July 1, 2014 - June 30, 2015
GOALS:
- Develop capacity to safely and effectively treat HCV in all areas and to monitor outcomes
- Develop a model to treat complex diseases in rural locations and developing countries

Methods
- Use Technology to leverage scarce healthcare resources
- Sharing “best practices”
- Case based learning
- Web-based database to monitor outcomes

The ECHO Model Improves CAPACITY and ACCESS Simultaneously

Case Presentations
**ECHO vs. Telemedicine**

ECHO Telehealth  
ECHO Supports Community Based Primary Care Teams  
Patients reached with specialty knowledge & expertise

Traditional Telemedicine  
Specialist Manages Patient Remotely

Telemedicine Improves ACCESS by using technology to bridge distance
First ProjectECHO HCV Team 2014

CNHS HCV Elimination Program Goals 8/2015 – 10/2018

1. Secure political commitment for HCV elimination

2. Expand the HCV screening program

3. Establish robust programs to link to care, treat, and cure patients with HCV.

4. Reduce the incidence of new HCV infections

CNHS: Cherokee Nation Health Services
Goal #1: Political Commitment
October 30, 2015, CNHS HCV Awareness Day

“As Native people and as Cherokee Nation citizens, we must keep striving to eliminate hepatitis C from our population.”
Chief Bill John Baker

Goal #2: Expand Screening Program

Screen 85% of Target Population
(80,928 AI/AN)

Universal Screening
• Ages 20-69

Non-Traditional Screening Sites
• Emergency Department
• Urgent Care
• Dental Clinics
• Behavioral Health
• OBGYN

Screening Modalities
• EHR Reminders
• Rapid Tests
• Lab Triggered screening

Cherokee Nation Health Services
HCV Screening in CNHS*  
10/2012 – 6/2017  
46 % of the target population has been screened

- Pre-elimination Period (10/2012-7/2015) 16,772 patients screened* 
- Post-elimination Period (8/2015 – 3/2017) 31,399 patients screened

HCV: Prevalence and Age Distribution*  
Post Elimination Period, 8/2015 – 5/2017

- 31,399 patients screened
- 1,076 HCV seropositive
  - Overall Prevalence ~ 3.4%
    - Male 4.4%
    - Female 2.9%
  - Baby boomers
    - 3.7% (12,540)
  - Younger than Baby Boomers
    - 3.3% (18,319)

*preliminary data
HCV Screening in Cherokee Nation*
8/2015 – 5/2017

HCV “Lab Triggered” Screening*
WW Hastings Hospital

*preliminary data
Lab Triggered Screening:
Location Where Patients Were Screened

97 patients with new HCV antibody screen at WW Hastings Hospital

- Urgent Care: 34%
- Emergency Department: 33%
- Primary Care: 14%
- Women’s Clinic: 8%
- Podiatry Clinic: 2%
- Orthopedic Clinic: 1%
- Surgery Clinic: 1%
- Behavioral Health: 3%
- Infectious Diseases: 3%
- Dental Clinic: 2%

67% of the HCV seropositive patients were detected in the Urgent Care/Emergency Department

HCV Screening in the Hospital Dental Clinic*

AWARENESS AND ENGAGED IN CARE STATUS AT THE TIME OF SCREENING IN THE DENTAL CLINIC N=36

- Unaware of HCV: 33%
- VL negative: 31%
- Aware, VL positive, Engaged: 17%
- Aware, VL positive, Not engaged: 19%

NUMBER OF PATIENTS Screened for HCV in the Dental Clinic, March 2016 – Feb 2017

*preliminary data

Cherokee Nation Health Services
Goal #3: Link to Care, Treat, and Cure

Evaluate 85%
Treat 85%
Cure 85%

Expand Clinical Capacity
- ProjectECHO

Expand Case Management Capacity
- Patient navigator
- Medication procurement
- Clinical case management

Cherokee Nation Health Services

HCV Services Available at CNHS
8/2015 – 9/2017

HCV Clinics
Treatment Group Characteristics*

No Difference in HCV Cure Rates between Provider Types at CNHS (n= 365)

Specialists are almost as good as primary care providers

Cherokee Nation Health Services

Genotypes
n= 547

- GT1: 14%
- GT2: 67%
- GT3: 19%

Fib-4 Index n=553

CNHS HCV Cascade of Care*

10/2012 - 6/2017

Number of Patients

- HCV RNA Positive Estimate: 1892
- HCV RNA Positive: 1229
- HCV evaluation: 957
- HCV antiviral treatment: 612

90% of patients who have completed treatment have achieved cure

*preliminary data
Goal #4: Reduce the Incidence of New HCV Infections

- Public and Provider Awareness
  - Public Campaign
  - Provider Training
- Contact Tracing
  - Acute HCV
  - PWID
- Harm Reduction
  - Treatment as Prevention
  - OST
  - NSEP (Not Implemented)

Cherokee Nation Health Services. PWID: People Who Inject Drugs
OST: Opioid Substitution Therapy, NSEP: Needle and Syringe Exchange Program

Public Campaign
September 20, 2016 - September 28, 2016.

Advertisement
- Gas pumping
- Indoor advertisement
- Radio advertisement
- Digital marketing
- Social media
Provider Education

- **HCV Providers**
  - University of Washington HCV Website
  - \(\frac{1}{2}\) day Preceptorship at the hub HCV clinic
  - Shadowing the provider on their first day of HCV clinic
  - Biannual workshops in the 8 outlying clinics
  - Bimonthly HCV projectECHO telehealth clinics

- **All providers**
  - Biannual workshops in the 8 outlying clinics
CNHS Buprenorphine Clinic*

- Buprenorphine Clinic started in March 2016 with 2 prescribers currently managing ~ 40 patients each
- Drop out rate has been < 10 % since March 2016
- No Emergency Department (ED) visits or hospitalizations due to buprenorphine misuse
- No ED visits or Hospitalizations for opioid overdose in patients managed with buprenorphine

Cherokee Nation Health Services
*preliminary data

Distribution of HCV Among Young Persons and Location of Syringe Service Programs

Of 29,382 persons 15-29 yrs. with HCV, 20% lived within 10 miles of a syringe service program.
How are we doing with our 85% Goals?

- Screening: 46% Completed, 54% Pending
- Evaluation: 78% Completed, 22% Pending
- Treatment: 64% Completed, 36% Pending
- Cure: 90% Completed, 10% Pending

Percentage

08/2015 - 10/2018

Moving Forward

- Advocate for NSEP
- Expand OST to all CNHS clinics
- Increase public awareness
- Intensify HCV screening in “hot spots”
- Engage and retain in care difficult to reach populations
- Identify networks of transmission to implement focused interventions (GHOST program)
- Adapt program goals to the newly defined recommendations for HCV elimination in the United States
- Define measures to monitor program outcomes
  - HCV incidence
  - HCV related mortality

Cherokee Nation Health Services
The visible people taking care of the invisible epidemic

GV (Wado)
Thank you

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Enhanced Recovery After Surgery (ERAS)

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Oklahoma State University Medical Center
Assistant Clinical Professor of Anesthesiology
Oklahoma State University Center for Health Sciences

Faculty Disclosure Statement

- I have no financial or conflict of interest with the following presentation
- I would love to potentially have a conflict of financial interest if any pharmaceutical or equipment company would like to give me money!
- I hope I properly cited all pictures, tables, and any other visual aids that I have potentially borrowed (stolen if you will) from other sources.
Goals and Objectives

- Background and History of ERAS
- Appreciation and Awareness for the Opiate Crisis/Epidemic
- Multimodal Approach to Pain
- Multidisciplinary Approach to ERAS
- Patient Benefits and Outcomes from ERAS
- Economical Impact of ERAS

"Be careful reading health books. You may die of a misprint."
- Mark Twain
ERAS? Tell Me More

- Multimodal, multidisciplinary approach to the care of the surgical patient
- Evidence-based comprehensive approach to perioperative care of the surgical patient
- Direct focus on patient-centered care with documented positive outcomes
- Directly shown to decrease Healthcare-associated infections (HAIs), length of hospital stay (LOS), healthcare costs, postoperative readmission rates, and most importantly patient morbidity and mortality

Clinical Basis

- Preoperative Patient Education (Psychological Stress Anxiolysis)
- Euvolemia and Nutritional Optimization
- Attenuation of Surgical Stress Response
- Optimal Pain Control
- Multimodal Analgesia
- Expedited Enteral Nutrition
- Ambulation
- Decreased rate of Organ Dysfunction
- Reduced Morbidity
- Enhanced Recovery with decreased length of stay

ERAS: It’s the 90’s, baby!
ERAS Origins

- First introduced by Henry Kehlet, MD, PhD in the mid 1990’s
- Focused on “Fast Tracking” surgery
- Primary emphasis on accelerated recovery through a multimodal/multidisciplinary approach to reducing patient surgical stress
- Dr. Kehlet as a colorectal surgeon proposed and implemented the innovative idea of “Fast Tracking” major abdominal surgery
- The thought process of challenging traditional practice with evidence-based practice begins to emerge
- Luckily, the 1990’s also sparked the wide spread adoption of minimally invasive laparoscopic techniques for surgical procedures
- The development of regional anesthetic techniques for pain control in the 1990’s also showed significant decreases in perioperative opiate requirements

YOU CAN’T CHANGE HOW WE’VE BEEN DOING SURGERY FOR YEARS!
What kind of results did Dr. Kehlet produce?

- Median postoperative hospital stay of two days for open colectomy patients vs the standardly accepted 5-10 days
- Dramatic improvement in postoperative pain control
- Faster return to Patient's baseline physiological functions
- Vast improvement in Patient satisfaction
- Sparked interest into multimodal analgesia approach to major surgical procedures
- Stimulated evidence-based research into the perioperative approach to a surgical patient
- Improved patient centered outcomes through a transdisciplinary implemented ERAS protocol

ERAS: Not a one trick Pony!

- Colorectal Surgery
- Gynecological Surgery
- Rectal Surgery
- Pelvic Surgery
- Vascular Surgery
- Urological Surgery
- Plastic and Reconstructive Surgery
- Orthopedics
So why is this so important to us as Oklahoma healthcare providers?

Chasing the Dragon

- 4 out of 5 heroin addicts started on prescription opioids
- Most common prescription opioids involved in drug overdose deaths are methadone, oxycodone, and hydrocodone (https://www.cdc.gov/drugoverdose/data-overdose.html)
- High percentage of Heroin addicts turned to Heroin from prescription opiates based on lower cost and easier access
- Women are more likely to have chronic pain, be prescribed higher doses, and use them for longer periods of time. From 1999-2010 there was a 400% increase in female overdose rates. (http://www.cdc.gov/vitalsigns/prescriptionpainkilleroverdoses/index.html)
Chasing the Dragon

- It is estimated that 26.4–36 million people worldwide are addicted to opioids with 2.1 million people in the United States suffering from substance abuse disorder related to prescription opioid use. (Substance Abuse and Mental Health Services Administration. Results from the 2012 National Survey on Drug Use and Health: Summary of National Findings. NSDUH Series H-46, HHS Publication No. (SMA) 13-4795. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2013.)
- In the United States this is particularly problematic, as Americans constitute only 5 percent of the world’s population, yet consume 80 percent of the global opioid supply, and 99 percent of the global hydrocodone supply, as well as two-thirds of the world’s illegal drugs. (Manchikanti L, Singh A. Therapeutic opioids: a ten-year perspective on the complexities and complications of the escalating use, abuse, and nonmedical use of opioids. Pain Physician. 2008 Mar;11(2 Suppl):S63-88.)

Surgery and Opiate addiction

- Roughly 50 million surgeries each year in the United States
- Its estimated 5-6 percent of patients not using opioids prior to surgery will still continue to fill prescription opiates well beyond an accepted surgery recovery period
- Pain medications written for pain control following surgery (minor or major) contributes to millions of new chronic opiate dependent/addicted Americans annually.
- Recent studies showing that opiate dependence can take hold in as little to 5-7 days.

Chad Brummett, M.D., director, division of pain research, University of Michigan Medical School, Ann Arbor; Anita Gupta, D.O., PharmD, international affairs fellow, Woodrow Wilson School, Princeton University, New Jersey; April 12, 2017, JAMA Surgery, online
The Foundation for Success

- Transdisciplinary education
- SIMPLE Protocols/Order sets/Algorithms
- Effective communication between all departments with distinct delineation of roles in the ERAS process
  - Pre-admission Testing Staff (Nursing and Anesthesia Providers)
  - Dietitians/Social Workers/Counselors/Chaplains
  - Nursing Staff (Preoperative/Intraoperative/Postoperative/Medical Floor)
  - Anesthesia Providers/Surgeons/Primary Care Providers/Specialists
  - Residents/Interns/Medical Students/Nursing Students

COMMUNICATION

No! No! NO, Nurse!!!!! I said "SLIP" off his SPECTACLES!!!!!

www.MyspaceGraphicsandanimations.com
Pre-hospital and Preadmission Testing

- Patient takes active role in the planning phase of their surgery
- Realistic Goals set for pain management and length of stay
- Detailed Patient/Family/Caregiver Education
- Nutritional and Hydration Education
- Patient Optimization and Risk Stratification
- Pre-habilitation of Select Patients
  - Labs
  - Tests (Guided to patient’s Co-morbidities and Functional Status)
  - Consultations (Cardiology, Pulmonology, GI, Nephrology, etc)
  - Medication Review and Optimization
  - SMOKING CESSATION
  - Stress Activity

Preoperative

- Thromboprophylaxis- Reduce thromboembolic events
- Abx Prophylaxis- Reduce infection rates
- Nausea and Vomiting Prophylaxis- Minimize PONV, wound dehiscence, and prolonged PACU stay.
- Avoid Mechanical Bowel Prep (not always feasible, commonly selective based on patient, surgery, and surgeon)
- Diet and Carbohydrate loading
  - Reduces Insulin resistance and promotes faster recovery of bowel
  - Patient ceases regular diet at MN (no MBP) and at 6 PM if MBP on night before
  - Patient can continue clear liquids (or carbohydrate drinks) as they wish until 2 hours before surgery
  - 20 ounce carbohydrate drink consumed 2 hours before induction of anesthesia
  - It is safe for patients (including those with diabetes, obesity, and GERD) to drink carbohydrate-rich drinks up to 2 hours before elective surgery

Preoperative Multimodal Analgesia

Multimodal analgesia involves use of multiple, simultaneous mechanisms of pain control acting synergistically to improve analgesic effect and reduce the doses of any single agent to minimize risks of side-effects.


Effective, narcotic-sparing analgesia is a major component of every Enhanced Recovery Protocol (ERP), however, the risk of highly variable responses, poor analgesia and opioid-related side effects (ORADE) remains an issue related to poor outcomes and satisfaction, and is strongly related to the risk of narcotic dependence after surgery.

Multimodal Analgesia

- REGIONAL ANESTHESIA!!!
- Acetaminophen (Oral or IV)
- Gabapentin and Pregabalin
- Local Anesthetics: IV Lidocaine infusion
- NMDA Receptor Antagonists
  - Ketamine (Bolus and/or Infusion)
  - Magnesium Sulfate
  - Memantine
  - Methadone
- NSAIDS (Oral, IV, Topical, or Rectal)
  - Nonselective COX inhibitors: Ketorolac, ASA, Ibuprofen, and Diclofenac
  - Selective COX 2 inhibitors: Celecoxib and Parecoxib

Pre-Holding Cocktail

- Gabapentin – 600mg PO, reduce to 300mg PO if older than 60. Do not give if over 70 unless they are currently on gabapentin or lyrica.
- Tylenol PO vs IV 1000mg if >70kg, 650mg if <70kg.
- Celecoxib 200mg PO (age 18-64)
- Utilize PONV Risk Protocol for use of Scopolamine Transderm Patch
- Entereg (Alvimopan)
  - 12 mg PO in the preop holding area if Surgeon requests
  - Continue 12 mg PO BID until first bowel movement or D/C
  - Selectively binds to mu opiate receptors in the GI tract and prevents the effects of opiates on GI motility
  - Does not have an effect on opioid pain control
Intraoperative Objectives

- Regional Anesthetic Blockade
  - Abdominal wall blocks, Intrathecal Narcotics, or Thoracic/Lumbar Epidurals
  - Short acting opiates, multimodal IV analgesics, and quick acting anesthetics
  - No drains, OG/NG Tubes, or Foley catheters left in patient

- Patient is closely monitored to maintain normothermia with forced air warmers, warm fluids, and appropriate room temperature.

- Goal Directed Fluid Therapy
  - Guided by a goal-directed algorithm using a pleth variability index
  - Less fluids showing better outcomes compared to traditional "flooding of fluids"
  - Roughly 80% crystalloid distributes into extravascular space
  - Less fluid mean less bowel wall edema, perioperative weight gain, and prolonged ileus
### Postoperative Considerations

<table>
<thead>
<tr>
<th>Regional anesthsia/analgesia</th>
</tr>
</thead>
<tbody>
<tr>
<td>No nasogastric tubes</td>
</tr>
<tr>
<td>Prevention of nausea and vomiting</td>
</tr>
<tr>
<td>Goal-directed fluid therapy</td>
</tr>
<tr>
<td>Early removal/avoidance of catheter</td>
</tr>
<tr>
<td>Early oral nutrition</td>
</tr>
<tr>
<td>Non-opioid oral analgesia</td>
</tr>
<tr>
<td>Early mobilization</td>
</tr>
<tr>
<td>Stimulation of gut motility</td>
</tr>
<tr>
<td>Audit of compliance/outcomes</td>
</tr>
</tbody>
</table>

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**The Best Medicine**

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career-news.healthcallings.com
Postoperative Considerations

- Remove all drains, tubes, and catheters if not already done prior to leaving OR/PACU
- Postoperative Glucose control
- Postoperative Analgesia
  - Continue Epidural (open surgery) up to 72 hours
  - Continue Multimodal Analgesia
- AMBULATION ASAP!
  - Most begin the night of surgery
- Diet begins the night of surgery
  - Chewing gum in PACU in Laparoscopic surgeries
  - Clear liquids (no carbonation) on day of surgery and solids by POD #2
  - Saline lock IV POD #1

Get a MOVE on it

- Mobilization can’t be stressed enough
- Strict Mobilization schedule
  - Out of bed 1-2 times on day of surgery
  - POD#1: 150-180 minutes out of bed
  - POD#2: 240 minutes out of bed
  - POD#3: 360 minutes out of bed and each day following
Discharge Criteria

- Based on Patient’s function and not a set timeline of days
- **Functional Criteria:**
  - Ambulation at an appropriate level
  - Return of bowel function based on bowel movements and flatulence
  - Ability to tolerate liquid diet
  - Pain controlled by oral medications
  - No signs of surgical site infection or systemic infection

Overall Benefits of ERAS

- ERAS patients in multiple studies regained gastrointestinal function more quickly (from 4–5 days to 2 days) and had a shorter convalescence (shown by clinical outcome measures 6 weeks after surgery).

- ERAS has been shown to reduce the average length of stay from 8–10 days to 3–4 days.

- Meta-analysis of randomized controlled trials have shown that ERAS programs reduce overall complication rates and LOS, without affecting 30-day readmission rates.
Overall Benefits of ERAS

- Direct reduction in Surgical Site Infections (SSIs)
  - Multiple studies showing a lowering up to 10%
- Increase in Patient Satisfaction
  - Improved Press Ganey Scores
  - Improved hospital satisfaction and pain control

Cost Savings

- Multiple studies showing cost savings/patient
  - Mayo Clinic: $1,039/patient
  - University Hospital of Lausanne: $2,084/patient
  - Duke: $1,854/patient
  - University of Virginia: $7,129/patient
- Reduced LOS leads to direct savings in regards to throughput
  - By freeing up hospital space for other admissions a direct increase in cost savings occurs
- The major financial impact is not in the reduced cost associated with shortening LOS (as most hospital costs accrue early in admission), but the increased revenue that accompanies the capacity for additional hospital admission. (J Am Coll Surg. 2015 Apr;220(4):430-43. doi: 10.1016/j.amcollsurg.2014.12.046. Epub 2015 Jan 9.)
Questions?
Relevant Disclosure and Resolution

I have no relevant financial relationships or affiliations with commercial interests to disclose.
Learning Objectives

1. Promote medical-community collaborative engagement in the area of pediatric obesity prevention and treatment

2. Promote community advocacy efforts in the area of pediatric obesity prevention and treatment

3. Address the impact of policy on obesity prevention and treatment

Continuing Medical Education Credit

1. T/F The Tulsa County Health Department Healthy Living Program strives to prevent and reduce tobacco use and obesity across Tulsa County.

2. T/F The Healthy Living Program is only one example of a Tobacco Settlement Endowment Trust Center of Excellence. There are many others throughout the state of Oklahoma with similar missions.

3. T/F Tobacco Settlement Endowment Trust activities are funded by Oklahoma taxpayers.

4. T/F The Fit 2 Learn Summit is free for attendees.

5. T/F The Fit 2 Learn Summit is open to classroom and physical education teachers, out of school time personnel, child nutrition directors and staff, interested parents and community members, and community and school level policy makers.
**Tobacco Settlement Endowment Trust**

- TSET works to reduce Oklahoma’s leading causes of preventable death – **tobacco use and obesity** – in order to reduce cancer and cardiovascular disease.
- TSET **distributes community-based grants** to improve the health of Oklahomans by reducing tobacco use, improving nutrition, and increasing physical activity.
- TSET also **funds research** for the prevention and treatment of cancer.
- Tobacco settlement funds are invested by a Board of Investors, and **only the earnings** from those investments are used by a Board of Directors to support efforts to improve the health of Oklahomans.
- TSET funds **DO NOT** come from taxes.
References


Additional Resources

- University of Connecticut Rudd Center for Food Policy and Obesity “Preventing Weight Bias: Helping Without Harming in Clinical Practice” http://www.uconnruddcenter.org/
- Obesity Action Coalition http://www.obesityaction.org/
- Project Implicit https://implicit.harvard.edu/implicit/
- Tulsa’s Anti-Bullying Collaboration http://www.preventbullyingtulsa.org/
- US Department of Health and Human Services https://www.stopbullying.gov/
- Oklahoma State Department of Education http://sde.ok.gov/sde/bullying-prevention
At the conclusion of this presentation the participants should be capable of identifying, and understanding:

1.) State and Federal Regulations on proper prescribing.
2.) Physician prescribing errors or omissions which constitute violations of the Osteopathic Medicine Act.
3.) Appropriate inclusions in medical records in order to comply with the Rules of the Board.
All health oversight agencies are established by law and share one common mission: to protect the public.

How do we protect the public, and the osteopathic profession, from the unscrupulous practitioner?

- State and Federal Statutes
- State and Federal Administrative Rules & Regulations
- Enforcement
- Screening and Licensing qualified applicants
OBNDD Prescribing Rules
OAC Title 475

- Only a registered practitioner may issue a prescription for a Schedule II, III, IV and V Controlled Dangerous Substance (CDS)

- It remains the responsibility of the practitioner to guard against diversion of CDS by authorized employees

- A prescription for a CDS to be effective must be issued for a legitimate medical purpose by a registered practitioner

- A prescription may not be issued for a CDS to a drug dependent person for the purpose of continuing his/her dependence on such drugs

- A corresponding responsibility rests with the pharmacist who fills the prescription

DEA Title 21
Code of Federal Regulations (CFR)

- 1301.71 Security Requirements Generally
  - All applicants and registrants shall provide effective controls and procedures to guard against . . . diversion of controlled substances

- 1301.76 Other Security Controls for Practitioners
  - The registrant shall not employ, as an agent or employee who has access to controlled substances, any person who has been convicted of a felony offense relating to controlled substances
Federal Rules

Code of Federal Regulations
21 CFR §829. Prescriptions

(a) Schedule II substances
Except when dispensed directly by a practitioner, other than a pharmacist, to an ultimate user, no controlled substance in schedule II, which is a prescription drug as determined under the Federal Food, Drug, and Cosmetic Act [21 U.S.C. 301 et seq.], may be dispensed without the written prescription of a practitioner, except that in emergency situations, as prescribed by the Secretary by regulation after consultation with the Attorney General, such drug may be dispensed upon oral prescription in accordance with section 503(b) of that Act [21 U.S.C. 353(b)]. Prescriptions shall be retained in conformity with the requirements of section 827 of this title. No prescription for a controlled substance in schedule II may be refilled.

(b) Schedule III and IV substances
Except when dispensed directly by a practitioner, other than a pharmacist, to an ultimate user, no controlled substance in schedule III or IV, which is a prescription drug as determined under the Federal Food, Drug, and Cosmetic Act [21 U.S.C. 301 et seq.], may be dispensed without a written or oral prescription in conformity with section 503(b) of that Act [21 U.S.C. 353(b)]. Such prescriptions may not be filled or refilled more than six months after the date thereof or be refilled more than five times after the date of the prescription unless renewed by the practitioner.

State Statutes, Rules, and Regulations

The Oklahoma Osteopathic Medicine Act
- Oklahoma Statute (O.S) Title 59
  - Sections 626 (3) (D), 637 (A) (2) (g) (3)

OAC Title 510 – State Board of Osteopathic Examiners
- Subchapter 9. Prescribing for Chronic Pain
  - Requirements for osteopathic physicians who prescribe for chronic, intractable pain

(visit our website – www.osboe.ok.gov)
The Statute (Law) – Title 59
What does it say?

- ... Investigators may investigate and inspect the records
- ... To ensure compliance with any State or Federal law or rule affecting the practice of osteopathic medicine
- ... Licensee shall be deemed to have given consent

**Refusal** to allow such access, entry, or inspection may constitute grounds for non-renewal, suspension or revocation of license

Violation of prescribing standards, *what can a doctor be charged with under Title 59?*

The Osteopathic Medicine Act

- Prescribing controlled substances without sufficient examination
- Not establishing a physician/patient relationship
- Not [prescribing] in good faith to relieve pain and suffering
- Indiscriminate or excessive prescribing of controlled drugs
- Violating any state or federal law on Controlled Dangerous Substances
Responsible Prescribing and Documentation

Documentation (OAC 510:5-9-1)

- Complete H & P
- Pain Assessment
- Physical and psychological function
- History of substance abuse
- Co-existing conditions
- Treatment of Objectives
- Risk/Benefit Discussion
- Other modalities

How – and why – do doctors get into trouble prescribing for chronic pain?

- Scammed by ‘professional’ patients
  - Failure to implement adequate screening procedures

- Failure to engage patient monitoring techniques
  - Guarding against drug diversion and abuse
  - Ignoring aberrant behavior and clinical impairment

- Failure to properly document patient charts
  - Inadequate H&P, lab, imaging, other diagnostic indicators
  - Treatment plans, assessments, records, referrals, consults

*Sometimes considered ‘passive mistakes’ resulting in non-punitive remedial action as opposed to punitive action (Board Order)*
What initiates an investigation by the Board?

- Complaints
  - Other physicians
  - Family members of patients
  - Pharmacists
  - Citizens of a community
  - Oklahoma Bureau of Narcotics
  - Drug Enforcement Administration

Preliminary Considerations

- During the investigation
  - Volume > CDS dosage units per month, year
  - Number CDS scripts per day
  - Class of CDS / combination
  - Ignoring or failing to check PMP
  - Patient Deaths
What precipitates serious and decisive Board action?

- Inappropriately, and intentionally, prescribing controlled dangerous substances for other than therapeutic reasons
  - Drugs for money
  - Drugs for drugs
  - Drugs for sex
  - Incompetence
  - Combination of the above

*Often resulting in long-term harm to patients, sometimes resulting in patient deaths (OD), contributory or directly*

**WHY?** Why would a doctor jeopardize their license, years of training, dedication and practice?

- The doctor is in financial trouble
- The doctor is impaired – chemical abuse/addiction
- The doctor suffers from a sexual addiction
- The doctor is incompetent
- A combination of any of the above factors

- and -

*It's easy!*

_Simply write prescriptions, hand them to patients, collect the money. They'll come back again, again and again. They won't call the Board._
Then what happens?

- Case goes to Board’s prosecuting attorney
- Charges (Complaint) are drafted
- Complaint submitted to the Board’s General Counsel for approval
- Respondent served with Citation, Notice of Hearing and Complaint
- Hearing before the Board

What are the consequences of Board action?

- Revocation
- Suspension
- Usually, emergency suspension or surrender of license
- Five (5) year Probation upon reinstatement
Consequences cont’d

- Competency evaluation (out-of-state)
- Prescribing course (out-of-state)
- Ethics course (out-of-state)
- Long-term treatment (out-of-state)
- Probation appearances (Board)
- Cost assessment of investigation and Board Hearing

Consequences cont’d

- Action to National Practitioner Databank
- Action to FSMB
- Action to Board website
- Action to OBN – loss of narcotic permit
- Action to DEA – loss of narcotic permit
- Possible criminal charges
- Show-cause hearings OBN / DEA
Consequences cont’d

- Legal fees (enormous)
- Loss of provider status – insurance
- Loss of hospital privileges
- Loss of specialty board certification

- Losses of a personal nature, at home and in the community!
- Catastrophic financial losses!

How do I stay out of trouble with the Board, OBN and DEA?

**DOCUMENTATION!**

“While the prescribing healthcare professional is obligated to treat pain, he or she must appreciate the importance of complete documentation . . .”

( *Pain Medicine News, Special Report, December 2004*)

“Curtailing drug abuse and drug diversion can be accomplished without unduly impeding the compassionate use of narcotic analgesics . . .”

( *Journal of Medical Licensure and Discipline, Vol 91, No. 2, 2005, David G. Greenberg, MD, MPH*)

**Screening, Monitoring, and Documentation**
Red Flags for Investigators

- Patients come from everywhere.
- Multiple drug stores used to fill prescriptions.
- Sparse medical records.
- Criminal records not checked: www.oscn.net
- Patient census

Red Flags for Investigators, cont’d

PMP Review
- High number of RX per month
- High number of dosage units per month
- Multiple prescribers for same patient
- Friends and Family receiving same CDS RX
- Multiple Overdose deaths
Accessibility to the Oklahoma State Board of Osteopathic Examiners

- Contact the Board by Mail:
  OSBOE
  4848 N. Lincoln Blvd., Suite 100
  Oklahoma City, OK 73105
- Contact the Board’s website:
  www.osboe.ok.gov
- Contact the Board by telephone:
  405.528.8625 (M-F) 8:00 a.m. – 4:30 p.m.
- Contact the Board by fax:
  405.557.0653
HIV IN OKLAHOMA...
MAKING A DIFFERENCE

Madhuri Lad, DO, FACOI, AAHIVS
Clinical Assistant Professor
OSU Department of Internal Medicine

OBJECTIVES

- Demographics
- Definitions
- Diagnosis and testing
- Treatment and complications
- Role of primary care
- Vaccinations
In 2014: 5,605 people with HIV
82% male (63% MSM), 17% female
23% black, 9% Hispanic, 56% white
Newly diagnosed in 2015: 319
# of deaths: 139
85% of male transmission due to MSM
MSM

- 4% of males in US
- 2/3 (67%) of all new HIV infections
- 52% of HIV-infected individuals in US
- Disproportionally affecting African American MSM and Latino MSM
- Annual anal paps due to increased risk of STIs, HPV, and anal cancers
- Annual hepatitis panel due to increased risk for HCV
Number and percentage of HIV-infected persons engaged in selected stages of the continuum of HIV care – United States

<table>
<thead>
<tr>
<th>Stage of Care</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV-infected</td>
<td>1178.350</td>
</tr>
<tr>
<td>HIV-diagnosed</td>
<td>941.950</td>
</tr>
<tr>
<td>Linked to HIV care</td>
<td>725.302</td>
</tr>
<tr>
<td>Retained in HIV care</td>
<td>480.395</td>
</tr>
<tr>
<td>On ART</td>
<td>426.590</td>
</tr>
<tr>
<td>Suppressed viral load (&lt;200 copies/mL)</td>
<td>328.475</td>
</tr>
</tbody>
</table>

Source: Adapted from Morbidity and Mortality Weekly Report 60: 1618-1623, 2011
DEFINITIONS

- HIV: Human immunodeficiency virus
- AIDS: Acquired immunodeficiency syndrome
  - CD4 = immune cells
  - Viral load = virus
- OI: Opportunistic infection
- ART: Antiretroviral therapy

Relationship between CD4 count and viral load

Figure 1: T-cell count = distance to crash, HIV RNA = speed of train

HIV RNA (viral load) = Speed of train

Slow: <5,000
Fast: 50,000+

CD4 count = Distance to crash

Source: John Coffin, PhD, Tufts University.
### HIV and AIDS

For more information, visit: aidsinfo.nih.gov

<table>
<thead>
<tr>
<th>Disease</th>
<th>Infectious organism</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pneumonia</td>
<td><em>Pneumocystis carinii</em></td>
</tr>
<tr>
<td>Pneumonia</td>
<td><em>Pneumocystis jiroveci</em></td>
</tr>
<tr>
<td>Kaposi’s sarcoma</td>
<td>Kaposi’s sarcoma virus (KSV)</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td><em>Mycobacterium avium</em></td>
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<tr>
<td>Tuberculosis</td>
<td><em>Mycobacterium tuberculosis</em></td>
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<tr>
<td>Cryptococcal meningitis</td>
<td><em>Cryptococcus neoformans</em></td>
</tr>
<tr>
<td>Toxoplasmic encephalitis</td>
<td><em>Toxoplasma gondii</em></td>
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<tr>
<td>Progressive multifocal</td>
<td>J C Virus (JCV)</td>
</tr>
<tr>
<td>Leukoencephalopathy</td>
<td></td>
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<tr>
<td>Cytomegalovirus encephalitis</td>
<td><em>Cytomegalovirus (CMV)</em></td>
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</tbody>
</table>
HOW IS HIV SPREAD?

- Blood
- Semen
- Pre-seminal fluid
- Vaginal fluids
- Rectal fluids
- Breast milk

HIV TESTING

- CDC recommends:
  a. Test ages 13-64 at least once
  b. Test annually if high risk
  c. Test all pregnant women
  d. Test when other STI’s present
HIV TESTING

- Antibody tests (3-12 weeks)
- Combination tests or Antibody/antigen tests (2-6 weeks)
- Nucleic acid tests (7-28 days)
- Rapid antibody tests
1-2 months

Flu-like symptoms
a. Fever
b. Headache
c. Rash
d. Lymphadenopathy
e. Diarrhea
<table>
<thead>
<tr>
<th>HISTORY</th>
</tr>
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<tbody>
<tr>
<td>❖ Date of diagnosis/ infection</td>
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<tr>
<td>❖ Previous ART regimens</td>
</tr>
<tr>
<td>❖ Previous CD4, VL, resistance, tolerance, response</td>
</tr>
<tr>
<td>❖ OI’s or malignancies</td>
</tr>
<tr>
<td>❖ Previous STI’s, abnormal pap</td>
</tr>
<tr>
<td>❖ Sexual history</td>
</tr>
<tr>
<td>❖ Any other risk factors</td>
</tr>
</tbody>
</table>
ANTIRETROVIRAL THERAPY (ART)

- Reduces HIV transmission
- Mortality declined (normal life expectancy), less OIs
- More than 50% deaths related to other diseases
- Reduce HIV-immune activation and co-morbidities
  - HIVAN
  - Malignancy (Kaposi’s sarcoma, lymphoma)
  - HAND
  - Hepatitis B & C liver disease
  - Tuberculosis
COMPLICATIONS OF ART

- **Hematologic**: CBC q 3-6 months
- **Renal/ Hepatic**: CMP q 3-6 months, UA
- **Dyslipidemia**: lipid panel q 6-12 months
- **Diabetes**: HgbA1c q 6-12 months
- **HTN**: BP check annually
- **Osteoporosis**: DEXA in postmenopausal women and men over age 50, vitamin D levels

<table>
<thead>
<tr>
<th></th>
<th>Every 3-6 months</th>
<th>Every 12 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>CD4</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Viral load</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>CBC</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>CMP</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Lipid panel</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>HgbA1c</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>RPR</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Quantiferon</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Hepatitis panel</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Urine GC/ CL</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Vitamin D level</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Cervical cancer: pap smear annually
Anal cancer: anal paps annually in MSM
STIs: RPR, GC/CL, trich annually
Hepatitis: hepatitis panel annually
TB: Quantiferon annually
Neuropsychiatric disorders: screening annually
Lipodystrophy

HIV assoc. Lipodystrophy
URGENCY OF ART

- CD4 < 200
- HIV-related conditions
  - OIs
  - Pregnancy
  - Chronic HBV
- Acute HIV infection

WHEN TO INITIATE ART

- CD4 < 350
- CD4 350-500
- CD4 > 500
- Long-term nonprogressors
- Elite controllers (<0.5%)
ANTIRETROVIRAL THERAPY

- Non-nucleoside reverse transcriptase inhibitors (NNRTIs)
- Nucleoside reverse transcriptase inhibitors (NRTIs) "nuc backbone"
- Protease inhibitors (PIs)
- Fusion inhibitors
- CCR5 antagonists
- Integrase strand transfer inhibitors (INSTIs)
ANTIRETROVIRAL THERAPY

- **2 NRTIs**
  a. Truvada/Descovy (tenofovir/emtricitabine)
  b. Epzicom (abacavir/lamivudine)
- **Add NNRTI, PI, or INSTIs**
  a. PI: Prezista/Norvir (darunavir/ritonavir) or Prezcobix (darunavir/cobicistat)
  b. INSTIs: Triumeq (dolutegravir), Stribild/Genvoya (elvitegravir), Isentress (raltegravir)

RESPONSE TO ART

- Virologic suppression (<20)
- Virologic failure (>200)
- Low-level viremia (<1000)
- Virologic blip (isolated detection)
- Virologic rebound
**DRUG RESISTANCE**

- Transmitted drug resistance (treatment-naïve)
  - Baseline Genosure
- Poor medication compliance
- Cross resistance

---

**GenoSure MG Report**

Monogram’s GenoSure MG report combines LabCorp’s genotyping capabilities (for faster turnaround), and Monogram’s proprietary algorithm...
BARRIERS TO ADHERENCE

- Mental health
- Substance abuse
- Social issues
- Nutrition
- Cost
- Complex regimens
- Adverse drug effects
- Nondisclosure of HIV status
VACCINATIONS

- No live vaccines when CD4 < 200
  a. Varicella
  b. Zoster
  c. MMR

- Vaccines recommended
  a. Prevnar
  b. Pneumovax
  c. Influenza
  d. Hep A & B
  e. Meningococcal
  f. HPV age < 26
  g. Tdap
Syphilis Staging Flowchart

Symptoms or Signs?

YES
1° (Ulcer) 2° (Rash, etc)
PRIMARY SECONDARY

NO
LATENT

ANY IN PAST YEAR?
Negative syphilis serology
Known contact to an early case of syphilis
Good history of typical signs/symptoms

YES
EARLY LATENT

NO
UNKNOWN or LATE LATENT
Kaposi’s sarcoma

HIV-associated Kaposi’s sarcoma
- 95% in homosexual or bisexual men

**Etiology:** genetic marker, Immune dysregulation, retrovirus, HIV-8 (Human Herpes Virus-8)

**Clinical Features:**
- Symptom & sign of respiratory & GIT involvement.
- In the classic form, they develop on the distal lower extremities.
- Cutaneous lesions may progress through three stages.

**MACULAR STAGE**
- There are violaceous patches of discoloration/M/E: Prominentery sign

**PLAQUE STAGE**
- Lesions become indurated and confluent/ Hyaline globules (PAS +)

**TUMOR STAGE**
- Solid red-purple nodules are formed/ Fusiform appearance
Seborrheic dermatitis

- 2-5% of the population
- Chronic, superficial, inflammatory disease of the skin
- Predilection for the scalp, eyebrows, eyelids, nasolabial creases, lips, ears, sternal area, axillae, submammary folds, umbilicus, groin, and gluteal crease
- Characterized by scanty, loose, dry, moist, or greasy scales, and by crusted pink or yellowish patches of various shapes and sizes
TYPES OF HSV

*Herpes simplex virus – 1:*
- Spread through saliva.
- Lesions above the waist, in oral, facial and ocular areas including pharynx, and skin.

*Herpes simplex virus – 2:*
- Transmitted through sexual contact.
- Involves genitalia and skin below the waist.
Human Papilloma Virus and Warts

Genital warts:
- Found on shaft of penis (male),
- vagina, vulva, cervix (female)
- and around anus
Herpes Zoster

- Also known as Shingles
- An acute viral infection of the nerve cells and surrounding skin.
- Characterized by a rash of blisters, can be very painful but is not life-threatening.
- Caused by the varicella zoster virus that also causes chickenpox.
Disseminated Herpes Zoster

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- http://aidsvu.org
• I have no conflicts of interest to disclose
OBJECTIVES

- Identify the criteria for diagnosing Pre-diabetes
- Identify the criteria for diagnosing Diabetes
- Define appropriate glycemic goals for different diabetic patient populations
- Provide brief review for common diabetic medications and their efficacy
- Provide brief review for insulin types

DIABETES MELLITUS

- Chronic disease affecting over 25 million Americans
- Approximately 7 million are unaware they have it
- Almost 1/3 of adults in the US >65 have diabetes
  - Approximately ½ are undiagnosed
- Estimated over 70 million have pre-diabetes
- Diabetes related care in the US in 2012, $245 Billion
A. β-Cell-Centric Construct: Egregious Eleven

The β-Cell is the FINAL COMMON DENOMINATOR of β-Cell Damage

1. Pancreatic β-cells
   - ↓ β-Cell function
   - ↓ β-Cell mass

2. ↓ Incretin effect

3. α-cell defect
   - ↑ Glucagon

4. Adipose
   - Increased lipolysis

5. Muscle
   - Decreased peripheral muscle uptake
   - Increased glucose production

6. Liver
   - Increased appetite
   - Decreased morning dopamine surge
   - Increased sympathetic tone

7. Brain

8. Colon/Biome
   - Abnormal microbiota
   - Possible decreased GLP-1 secretion

9. Immune Dysregulation/Inflammation

10. Stomach/Small Intestine
    - Increased rate of glucose absorption

11. Kidney
    - Increased glucose re-absorption

Insulin Resistance

HYPERGLYCEMIA
39 YEAR OLD FEMALE

- Presents for follow up for lab that was performed as part of an employee physical
- No complaints
- BP 139/80, HR 81, BMI 36
- PMH unremarkable
  - FHx Father renal cell carcinoma, mother DM
- PE basically unremarkable
- Labs from employee physical 2 months previous
  - CMP basically unremarkable
  - A1C 6.6

39 YEAR OLD FEMALE

- Repeated A1C 6.3
PRE-DIABETES

- FPG 100 – 125
- HgbA1C 5.7 – 6.4

SURVEY OF PCP’S ASSOCIATED WITH JOHN HOPKINS

- The purpose of the survey was to assess PCP’s knowledge of risk factors that should prompt pre-diabetes screening, lab criteria, and guidelines for management
- 140 participants
  - 130 physicians
  - 9 ARNP
  - 1 PA
- 6% of the 140 were able to identify 11 risk factors that should prompt further screening under the guidelines of the ADA
  - Average number correctly identified was 8
- 17% correctly identified the lab parameters for pre-diabetes
RISK FACTORS FOR PRE-DIABETES

- Body mass ≥ 25
- Age > 45
- HTN
- Dyslipidemia
- Heart Disease
- Family history of diabetes in first degree relative
- Sedentary lifestyle
- Race with darker skin
- History of gestational diabetes or women having a baby that weighed more than 9lbs
- Low birth weight (< 5.5 lbs are more likely to get DM type 2 later in life)
- High visceral fat around the abdomen
- Smoking
- PCOS

DOES DIAGNOSING PRE-DIABETES MATTER?

- “To find health should be the object of the doctor. Anyone can find disease.” A.T. Still MD, DO

- “An ounce of prevention is worth a pound of cure.” Ben Franklin
**DIAGNOSING PRE-DIABETES DOES MATTER**

- A1C between 5.5 and 6, has a 5 year risk from 9-25%
- A1C between 6 to 6.5, has a 5 year risk of 25-50%
- A1C between 6 to 6.5, has a 20X higher relative risk compared to an A1C of 5

**LIFE STYLE CHANGES**

- Weight loss and physical activity together have the potential to reduce the A1C by 1 - 2%
- Refer Pre-diabetics to MNT to delay progression
- A targeted weight loss goal of 5 - 7% and an exercise goal of 150 minutes of moderate intensity exercise per week, decreased the number of people going on to develop diabetes compared to usual care by about 2/3
- ADA 2017 Guidelines recommend Metformin be considered in patients with pre-diabetes who fail to decrease their risk for diabetes through life style changes
TYPE 2 DIABETES

- Can be prevented or delayed early on by lifestyle changes
- It is a disease of insulin resistance and a failing pancreas
- Pathologic and functional changes in target organs can occur long before clinical symptoms and diagnosis is made
RISK FACTORS FOR DIABETIC SCREENING

- Increased urination
- Increased thirst
- Increased hunger
- Fatigue

DIAGNOSIS OF DM

- A1C ≥ 6.5
  - POC should not be used for diagnosis
- FPG ≥ 126
- OGTT w/ 2 hour glucose ≥ 200
- Classic symptoms w/ random glucose ≥ 200

  Unless unequivocal hyperglycemia, 1 – 3 should be confirmed by repeat testing
GLYCEMIC GOALS

<table>
<thead>
<tr>
<th>Population</th>
<th>Pre-Prandial Glucose</th>
<th>Post Prandial Glucose (1 - 2 hours after start of meal)</th>
<th>Bedtime Glucose</th>
<th>A1C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adult, non-pregnant</td>
<td>80 - 130</td>
<td>&lt;180</td>
<td></td>
<td>7%</td>
</tr>
<tr>
<td>Older Adults - healthy</td>
<td>90 - 130</td>
<td>90 - 150</td>
<td>7.5%</td>
<td></td>
</tr>
<tr>
<td>-complex</td>
<td>90 - 150</td>
<td>100 - 180</td>
<td>&lt;8%</td>
<td></td>
</tr>
<tr>
<td>-very complex</td>
<td>100 - 180</td>
<td>110 - 200</td>
<td>&lt;8.5%</td>
<td></td>
</tr>
<tr>
<td>Pediatric</td>
<td>90 - 130</td>
<td>90 - 150</td>
<td>7.5%</td>
<td></td>
</tr>
</tbody>
</table>

GOALS

- Goals should be individualized
- Goals are difficult in the elderly
  - Older adults are excluded from 2/3 of trials
  - The risk of all-cause, cardiovascular, and cancer mortality appears to increase significantly among older adults with diabetes and HgbA1C > 8 (HgbA1C and mortality in older adults with and without diabetes. Diabetes Care 2017; 40:453-460 Palta et al)
  - “Better predictors both for the risk of and the risk from hypoglycemia for a given individual and should remind us to avoid agents likely to cause hypoglycemia” (Is HgbA1C < 7 a marker of poor performance in individuals >65 years old? Diabetes Care 2017; 40:526-528 Bloomgarden et al)
- Modify the goal if hypoglycemia, especially if unaware of hypoglycemia
- Check Postprandial blood glucose if pre-prandial values and A1C levels don’t match up
  - Ex. Patient advises pre-prandial range from 90 - 120 and the A1C is 8.5
ORAL MEDS

- Biguanides
- Sulfonylureas
- Meglitinides
- Alpha-glucosidase inhibitors
- Thiazolidinediones
- DPP-4 inhibitors
- GLP-1 agonists
- SGLT2 inhibitors
- Bile Acid Sequestrants
- Dopamine receptor agonist
- Amylin
**METFORMIN**

- United Kingdom Prospective Diabetes Study
  - Patients treated with metformin
    - 32% reduction in any diabetes-related end point
    - 42% reduction in diabetes-related mortality
    - 36% reduction in all-cause mortality
    - 39% reduction in myocardial infarction
    - 50% reduction in fatal myocardial infarction

**Benefits**
- A1C reduction of 1-2%
- Inexpensive
- May be used in fatty liver disease
- Approved in children with T2DM
- Decreased cardiovascular events
- Minimal to no hypoglycemia
- No weight gain

**Side Effects**
- GI
- Vitamin B12 deficiency with long term use
**METFORMIN - PRECAUTIONS**

- Cr ≥ 1.4 in females, ≥ 1.5 in males
  - Can be used in patients with a stable GFR > 30
  - If low GFR, reduce dose and advise to stop if N/V/D and/or dehydration
- Acute or chronic metabolic acidosis (increases risk of lactic acidosis – rare)
  - Temporarily discontinue before procedures that require IV contrast and/or acute illnesses that may compromise renal or liver function
- Acute or significant heart failure
  - May be used if renal function is normal but avoid if unstable or in hospitalized patients w/CHF
- Age ≥ 80
- Avoid in patients with advanced cirrhosis or excessive alcohol use

**SULFONYLUREAS**

- Glyburide, Glipizide, Glimeperide
- Increase insulin secretion in the pancreas
- Glipizide does not have active metabolites so does not require dose adjustment in renal disease
- Precautions
  - Glyburide is on the Beers Criteria for potentially inappropriate meds in older adults
  - Severe allergy to sulfa
  - Significant renal impairment
# SULFONYLUREAS

**Benefits**
- A1C reduction of 1-2%
- Inexpensive
- Decreases microvascular risk

**Side Effects**
- Weight gain
- Hypoglycemia

# TZDS

**Benefits**
- Lower A1C 0.5–1.4%
- May cause the resumption of ovulation in women who are anovulatory secondary to insulin resistance or PCOS (consider adding contraception if appropriate)
- Not contraindicated in renal dysfunction

**Side Effects**
- Modest Weight gain
- Peripheral edema
  - May exacerbate CHF
  - Contraindicated in NYHA Class III/IV heart failure
- Increased risk of bone fractures
- Caution in Liver disease (primarily due to the first TZD marketed had issues)
DPP-4 INHIBITORS

- Sitagliptin, Saxagliptin, Linagliptin
- Prevents the breakdown of naturally occurring glucagon like peptide-1 (GLP-1) in the body
  - GLP-1 is a gut hormone that stimulates insulin secretion, inhibits glucagon secretion, and stimulates beta cell proliferation
- Reduce the dose if decreased renal clearance (different GFR level depending on the med so, overall, safe if decrease the dose in CKD)
  - Exception is Linagliptin, less than 5% excreted in the urine so not affected by decreased renal function

DPP-4 INHIBITORS

**Benefits**
- Monotherapy or combination
- Lowers A1C 0.5 – 0.8%
- Weight neutral
- Generally well tolerated

**Side effects**
- URI symptoms, HA
- Pancreatitis (rare)
- Expense
- Reduce in renal patients
- Severe joint pain
  - Consider as cause if it presents and discontinue if appropriate
GLP-1 RECEPTOR AGONISTS

### Benefits
- Lowers A1C 0.5 – 1%
- Weight loss
- Once daily or once weekly formulations

### Side effects
- N/V/D
- Hypoglycemia in patients on sulfonylureas
- Delays gastric emptying, if taking meds that need rapid absorption, they need to be taken an hour before taking GLP-1
- Expense

---

GLP-1 RECEPTOR AGONISTS

- Can be used with insulin but NOT in place of insulin
- No benefit from combining with DPP-4
- It’s an injection
  - Byetta is subQ twice daily within 60 minutes of meal (at least 6 hours apart)
  - Victoza subQ once daily independent of meals
  - Bydureon or Trulicity are both subQ once weekly independent of meals
- Caution in patients with GI disease, pancreatitis, gastroparesis, history of bowel obstruction, or Cr < 50 (don’t use if Cr < 30)
- Contraindicated if history of MEN2 syndrome or family history of medullary thyroid cancer
- If taking Warfarin, monitor INR more frequently until INR stable
**SGLT2 INHIBITOR**

**Benefits**
- Lowers A1C 0.7 – 1%
- Weight neutral to 0.6% loss
- Decrease blood pressure 3.3 – 5mmHg

**Side effects**
- Mycotic infections
- UTI
- Increased urination
- Not effective if GFR < 45

**SGLT2 INHIBITORS**

- >65 years of age – increased hypotension, syncope, dizziness, orthostatic hypotension
- >65 smaller reduction in A1C
- REMEMBER – there have been cases of euglycemic ketoacidosis. Typically with illness, infection, or stress but glucose was normal despite s/sx of ketoacidosis
- Bone mineral density in the hip and spine have been noted to decrease in about 12 weeks
HEAD TO HEAD LOWERING A1C

- Metformin 1-2%
- Sulfonylureas 1-2%
- TZD’s 0.5-1.4%
- DPP-4 Inhibitors 0.5-0.8%
- GLP-1 Receptor Agonists 0.5-1%
- SGLT2 Inhibitors 0.7-1%
- Metaglinides (Starlix, Prandin) 1-1.5%
- Alpha-Glucosidase Inhibitors (Precose, Glyset) 0.5-0.8%

RATIONALE FOR YOUR COMBINATIONS

Table 3. Beta-Cell-Centric Model: Mediating Pathways of the Egregious Eleven Targeted by Individual Pharmacologic Treatments
START INSULIN?

- ADA
  - New diagnosis of T2DM with severe hyperglycemia, weight loss, or ketosis
  - Consider insulin if blood glucose is >300 and/or A1C >10%
  - Dual therapy if A1C >9% or not meeting goals after 3 months

ALGORITHM FOR ADDING/INTENSIFYING INSULIN

START BASAL (Long Acting Insulin)

- **A1C <8%**
  - TDD: 0.5-0.8 U/kg

- **A1C >8%**
  - TDD: 0.2-0.3 U/kg

Insulin titration every 2-3 days to reach glycemic goal:

- Fixed regimen: Increase TDD by 1 U
- Adjustable regimen:
  - BMI: >25 kg/m²: +4–6% of TDD
  - BMI: 18.5–24.9 kg/m²: +2% of TDD
  - BMI: <18.5 kg/m²: +1% of TDD

- If hypoglycemia, reduce TDD by:
  - KG > 50%: 10% - 20%
  - KG: 40% - 60%: 20% - 40%

Consider discontinuing or reducing sulfonylurea after starting basal insulin (basal analogs preferred if PKP)

- Glycemic Goal:
  - 7% for most patients with T2DM, fasting and premeal HbA1C <110 mg/dL, absence of hypoglycemia
  - A1C and HbA1C targets may be adjusted based on patient’s age, disease duration of diabetes, presence of comorbidities, diabetic complications, and hypoglycemia risk

INTENSIFY (Prandial Control)

- **Add basal BID or QID**
- **Add Prandial Insulin**

- Basal Plus 1, Plus 2, Phase 3
- Basal Bypass

Glycemic control every 2-3 days to reach glycemic goal:

- Increase prandial dose by 10% at 1-2 points if hypoglycemia or severe hypoglycemia
- If hypoglycemia, reduce TDD basal and/or prandial insulin by:
  - 5% consistently <70 mg/dL: 10% - 20%
  - General hypoglycemia requiring assistance from another person or BG <40 mg/dL: 20% - 40%
TYPES OF INSULIN

- **Rapid Acting**
  - Covers insulin needs for meals at the time of injection
- **Short Acting**
  - Covers insulin needs for meals within 30 min
- **Intermediate Acting**
  - Covers insulin needs for about half the day or overnight
- **Long Acting**
  - Covers insulin needs for the whole day
- **Premixed**
  - Predetermined combination of insulin with a biphasic action

---

Pharmacokinetics of the most commonly used insulin preparations

<table>
<thead>
<tr>
<th>Insulin type</th>
<th>Onset of action</th>
<th>Peak effect</th>
<th>Duration of action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lantus aspart, glulisine</td>
<td>5 to 15 minutes</td>
<td>45 to 75 minutes</td>
<td>Two to four hours</td>
</tr>
<tr>
<td>Regular</td>
<td>About 30 minutes</td>
<td>Two to four hours</td>
<td>Five to eight hours</td>
</tr>
<tr>
<td>NPH</td>
<td>About two hours</td>
<td>4 to 12 hours</td>
<td>18 to 24 hours</td>
</tr>
<tr>
<td>Insulin glargine</td>
<td>About two hours</td>
<td>No peak</td>
<td>20 to &gt;24 hours</td>
</tr>
<tr>
<td>Insulin detemir</td>
<td>About two hours</td>
<td>Three to nine hours</td>
<td>6 to 24 hours*</td>
</tr>
<tr>
<td>NPL</td>
<td>About two hours</td>
<td>Six hours</td>
<td>15 hours</td>
</tr>
<tr>
<td>Insulin degludec</td>
<td>About two hours</td>
<td>No peak</td>
<td>&gt;40 hours</td>
</tr>
</tbody>
</table>

NPH: neutral protamine hagedorn; NPL: neutral protamine lispro.
*Duration of action is dose-dependent. At higher doses (>0.8 units/kg), mean duration of action is longer and less variable (22 to 23 hours).
LONG ACTING

• 0.2 units/kg at the same time daily
• If higher FSBS (or A1C), may need 0.3 to 0.4 units/kg
• Typically 10 units at bedtime
• Low risk of hypoglycemia at night as shouldn’t drop blood sugar by more than 40 during the night

RAPID ACTING

• If basal insulin is not enough, may need to add to the largest meal of the day
  • Should be considered when the total daily dose of basal insulin is greater than 0.5U/kg
• If it is clear the patient needs prandial coverage, add to each meal
• Carb counting vs set dose
SELF TITRATION?

- The patient is responsible for their own care >99% of the day
- Assuming you are comfortable with the patient to be able to make appropriate changes, self titration can work well
- Follow a three day pattern, if not achieving fasting goal (morning), make adjustment
- If unexplained hypoglycemia, change the insulin dose that caused it immediately

DIFFERENT METHODS FOR SELF-TITRATION

- Increase dose by 1 unit every day until the fasting goal is met
- Increase dose by 2 units (or 10%) every 3 days until the fasting goal is met
- If using one of the very long acting (Tresiba), the adjustment should be 3-4 days because of the duration
- If unexplained hypoglycemia, change the insulin dose that caused it immediately
- May be reasonable to set a limit
  - If you make more than x number of changes, let me know or come in
BLOOD PRESSURE

- Elevated blood pressure in patients with T2D is associated with an increased risk of cardiovascular events.
- ADA recommends initiating treatment if blood pressure > 140/90.
- AACE recommends that BP control should be individualized but a target of < 130/80 is appropriate for most patients.

LIPIDS

- T2D carries a high lifetime risk for developing ASCVD.
- ADA recommends:
  - DM but without additional ASCVD risk factors should receive a moderate intensity statin.
  - If additional risk factors, a high intensity statin should be considered.
- AACE considers high risk if DM with no risk factors.
- AACE recommends LDL-C targets of < 100.
  - < 70 if very high risk (DM w/CKD or 1 or more risk factors).
  - < 55 if extreme risk (established CVD).
A1C, BLOOD PRESSURE, LDL

- Population based retrospective cohort study of 144,271 patients w/T2D without prior clinical diagnosis of CVD from 2008-2011
- Target
  - A1C < 7%
  - Blood pressure < 130/90
  - LDL-C < 2.6 mmol/L
- Achieve 1 target
  - Reduced risk of CVD 13 – 42%
- Achieve 2 targets
  - Reduced risk of CVD 31 – 52%
- Achieve 3 targets
  - Reduced risk of CVD 55%
- Greatest reduction if only met 1 target
  - LDL-C reduced risk 42%
  - Blood pressure reduced risk 18%
  - A1C reduced risk 13%

ASPIRIN

- ADA recommends daily aspirin (75-162mg) if:
  - ≥ 50 years of age w/DM and at least one additional risk factor
  - the patient does not have an excessive bleeding risk
CONCLUSION

• MNT, Diabetic Education, and DPP are important
• Start with metformin
  • If A1C >9, one med won’t do it
• Multiple second options
  • Don’t forget insulin
  • Individualize to the patient
  • Just because you can prescribe it doesn’t mean the patient can afford it
  • If they can’t buy it, they can’t take it

DISCUSSION/QUESTIONS
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- Consensus Statement By The American Association of Clinical Endocrinologists and American College of Endocrinology on the Comprehensive Type 2 Diabetes Management Algorithm – 2017 Executive Summary; Endocrine Practice Vol 23 No 2 Feb 2017
- Reducing CV Risk in Diabetes, An ADA Update; The Journal of Family Practice; May 2017
- Diabetes Practice Update; Aug 24, 2017
Difficult to Treat Hypertension
According to Goldilocks

JNC 8 Blood Pressure Goals (2014)

- BP Goal 60 years old and greater*: systolic < 150 and diastolic < 90. (Grade A)**
- BP Goal 18 - 59 years old*: diastolic < 90. Ages 30 – 59 (Grade A)** Ages 18 - 29 (Grade E)**
- BP Goal 18 - 59 years old*: systolic < 140 (Grade E)**
- BP Goal 18 - 69 years old with CKD (without albuminuria) – systolic < 140 and diastolic < 90 (Grade E)** > 18 years and albuminuria > 30 mg/g of creatinine – systolic < 140 and diastolic < 90 (Grade E)**
- BP Goal > 18 years with diabetes: systolic < 140 and diastolic < 90 (Grade E)**

Note: The only comorbid conditions specifically addressed are CKD (GFR < 60 or albuminuria > 30mg per g of creatinine) and diabetes mellitus. Albuminuria with GFR > 90 is considered to be CKD Stage I.

*Without comorbid conditions (CKD or diabetes mellitus)

BP Goal for patients 70 and Older and with CKD (but no Albuminuria or Diabetes)

- Specific recommendation not made
- No outcomes trial included large number of patients 70 and older
- Individualize treatment
  - Frailty
  - Comorbidities
  - Rising creatinine
  - Orthostatic symptoms
- Inference is that BP goal may be higher than 150 systolic unless albuminuria or diabetes are present

Inferences Based on Recommendations

- The older the patient, the less aggressive BP control
- Controlling diastolic to < 90 in ages 30-59 is very important
- BP goal for < 60 is 140/90
- BP goal for 60 and older is 150/90
- BP goal in patients with urine albumin > 30 mg/g creatinine (microalbuminuria) who are > 60 is the same as under 60
- BP goal in diabetics 60 and older is the same as under 60
- BP goal may be > 150 systolic even in CKD patients without albuminuria and diabetes mellitus if > 70 years old
- BP goal in patients with atherosclerotic cardiovascular disease is the same as for the general population
- The only recommendations made with high probability:
  - BP goal for age 60 and older and no comorbid conditions is systolic < 150 and diastolic < 90
  - Diastolic BP goal for ages 30 – 59 is < 90
- All other recommendations are expert opinion.
## Goal BP According to Various Guidelines

<table>
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<th>Guideline</th>
<th>&lt;60 years</th>
<th>60-79 years</th>
<th>&gt;80 years</th>
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AHA/ACC - American Heart Association/American College of Cardiology 2011  
ASH/ISH – American Society of Hypertension/International Society of Hypertension 2014  
BHS/NICE – British Hypertension Society/National Institute for Health and Clinical Excellence 2011  
CHEP – Canadian Hypertension Education Program 2014  
ESH/ESC – European Society of Hypertension/European Society of Cardiology 2013  
JNC 8 – Eighth Joint National Committee on Detection, Prevention and Treatment of Hypertension 2014  
ISHIB – International Society of Hypertension in Blacks 2010  
SPRINT Trial – Systolic Blood Pressure Intervention Trial 2015  
*May be higher than 140 systolic if 70 or older and no diabetes or albuminuria
When to Allow BP to increase

- Diastolic BP < 70 or systolic BP < 120 and age 60 or older with one of the following:
  - Chest pain
  - Rising creatinine
  - Orthostatic symptoms (dizzy when first standing)
  - Easy fatigability
  - TIA like symptoms
  - Or patient states, “I just don't feel good.”
- 60 years or older and diastolic BP < 60 or systolic BP < 110 even without symptoms
- Allow permissive hypertension (systolic up to 160) if 70 years or older (even if diabetic or albuminuria is present) with one of the following:
  - Rising creatinine in CKD 3b or higher (GFR 44 or lower)
  - Carotid artery disease with symptoms
  - Diastolic BP < 70

“Expert” opinion - Mine
Derivation of Blood Pressure

\[ \text{MAP} = \text{Systemic Vascular Resistance} \times \text{Cardiac Output} \]

Systemic Vascular Resistance
- Sympathetic Nervous System
- Angiotensin II
- Calcium Channels
- Nitric Oxide

Cardiac Output
- Stroke Volume
- Heart Rate

Vasodilators act directly

Systemic Vascular Resistance
- Sympathetic Nervous System
  - Beta Blockers
  - Centrally Acting Alpha Agonists
- Angiotensin II
  - ARBs
  - ACEIs
- Calcium Channels
  - Dihydropyridines
  - Non-dihydropyridines
- Nitric Oxide
  - Nebivolol

Cardiac Output
- Stroke Volume
- Heart Rate

Diuretics
- ARBs
- ACEIs

Beta Blockers
Non-dihydropyridines
Inferences from JNC 8
Treatment Recommendations

- Do not initiate treatment with alpha blocker, alpha agonist, beta blocker, or vasodilator
- Do not initiate treatment in the black population with ACEI or ARB unless CKD present
- Increase dose or add a drug if BP not controlled. The added drug is not defined but should not be in same family as first drug.
- Life style modification should always be part of the treatment and, in some cases, may be the only treatment
- Refer if more than two drugs required for control
Sprint Trial (November 2015)

- 9361 persons with systolic BP 130 mm Hg or higher all over age 50
- All had increased cardiovascular risk, but no diabetes, stroke or PKD
- CKD patients included
- Group 1 target systolic BP <120 – intensive treatment group
- Group 2 target systolic BP <140 – standard treatment group
- Primary outcome – MI, stroke, HF, or death from CV cause
- Lower rate of primary composite outcome in Group 1 – p<0.001
- Lower all-cause mortality in Group 1 – p<0.003
- Lower rate of serious side effects in Group 2
  - Hypotension
  - Syncope
  - Electrolyte abnormality
  - Acute kidney injury
- Group 1 average systolic BP decrease 18 mm Hg
- Group 2 average systolic BP decrease 5 mm Hg

BP Characteristics of Participants

- Average starting systolic BP 139.7
- One third less than or equal to systolic BP of 132
- One third 132 – 144 systolic BP
- One third greater than or equal to 145
- All patients age 50 or older
- Average end systolic BP of standard treatment group 136.2
- Average end systolic BP of intensive treatment group 121.4
Secondary Outcome Differences

- Myocardial infarction – p 0.19
- Other acute coronary syndrome - p 0.95
- Stroke - p 0.50
- Heart failure - p 0.002 in favor of intensive treatment group
- Composite renal outcome - p 0.76
- Albuminuria - p 0.11
- >30% reduction of GFR - p<0.001 in favor of standard treatment group

Serious Adverse Events

- Hypotension – p 0.001
- Syncope – p 0.05
- Bradycardia – p 0.28
- Electrolyte abnormality – p 0.02
  - Sodium <130 – p<0.001
  - Potassium <3 – p 0.006
- Injurious fall – p 0.71
- Acute kidney injury – p<0.001
Concerns with Sprint Trial

- In conflict with ACCORD Trial (all diabetic) which did not show significant improvement in outcomes with aggressive BP treatment
- Sprint - no diabetics
- Renal function made worse
- Higher incidence of adverse events
- Stroke, MI, other coronary events were not decreased
- Only heart failure was decreased
- Average starting BP was 139.7 with multiple adverse events
- If starting systolic BP 150, 170, 180 or 200, can systolic BP <120 be tolerated without serious adverse events?

Common Difficult Cases

Case # I
85 year old white female with BP of 210/70 and no complaints when originally seen. Told she had hypertension 10 years ago but that it was not high enough to do anything about. She does not know what BP was then. Normal renal function for age, no albuminuria and no history of cardiac problems or diabetes. About 40 lbs. over weight. Denies HA, dizziness, visual problems, shortness of breath or chest pain. Has no peripheral edema. Admits she is nervous because this is her first visit and you seem a little intimidating.
How do you Treat Her?
(you have instructed her to take her BP at home, Lose weight and restrict sodium to 2000 mg/day.)

- 1. No medication at this time
- 2. HCTZ 12.5 mg daily
- 3. Clonidine 0.1 mg bid
- 4. Lisinopril 10 mg daily
- 5. Metoprolol succinate 50 mg daily
- 6. Amlodipine 5 mg daily
- 7. Verapamil 40 mg tid

BP decreased to 160/56 with Your Treatment
(Home BPs averaged 156/52)
Now what?

- 1. Continue present regimen
- 2. If no drug used, increase sodium intake
- 3. Discontinue the drug if used
- 4. Cut the medication in half if used
- 5. Add a second drug that has not been used
- 6. Double the dose of the drug used
Case # 2

26 year old, white male, type I diabetic has no cardiac disease, but GFR is 42 cc/min (S. creatinine 2.1) and 4.5 grams of protein in 24 hour urine specimen. BS is poorly controlled (Hgb A1C is 8.6). Has 1+ PTE and lungs are clear, He is well nourished and not over weight. Presently taking furosemide 40 mg bid and amlodipine 10 mg daily. BP is 138/88. Complains of mild shortness of breath with exertion only.

How do you treat him?

(Assume he is placed on low sodium, diabetic diet and insulin has been appropriately adjusted)

1. Increase Lasix to 80 mg bid
2. Add lisinopril 20 mg daily
3. Add losartan 50 mg daily
4. Add metolazone 5 mg daily
5. Increase furosemide to 80 mg bid and DC amlodipine
6. DC amlodipine and add lisinopril 40 mg daily
Case #3

65 year old black male who you are seeing for the third time in 3 months with progressive drop in BP each month. Now has BP of 158/82 and when you started it was 174/96. He was placed on a 2000 mg per day sodium diet and started on HCTZ 25 mg daily at the first visit. He has no other medical problems except that his GFR was 54 when you started (creatinine 1.35) and is now 46 with a creatinine of 1.5. There is no microalbuminuria. He says he feels good.

What do you do now?

- 1. Increase HCTZ to 50 mg daily
- 2. Add diltiazem LA 120 mg daily
- 3. Add lisinopril 10 mg daily
- 4. Add metoprolol succinate 50 mg daily
- 5. Add amlodipine 2.5 mg daily
- 6. Nothing more for now
Case # 4

72 year old, moderately obese, diabetic, white female with previous history of MI and has 2 coronary artery stents. BS is well controlled. 3.5 grams protein in 24 hour urine. Recent episode of CHF requiring hospitalization 3 months ago (EF 40% then). C/O orthopnea and has mild conversational dyspnea now. GFR 34 cc/min (S. creatinine 2.4) and has 2+ PTE. BP 176/98, HR 96/min and taking Lasix 40 mg bid, ramipril 20 mg daily, and carvedilol 25 mg bid.

How do you treat her
(Assume she has been placed on low sodium, weight loss diet)

1. Increase ramipril to 20 mg bid
2. Increase Lasix to 80 mg bid
3. Increase carvedilol to 50 mg bid
4. Add hydralazine 25 mg qid
5. Increase ramipril to 20 mg bid and increase Lasix to 80 mg bid
6. Admit to hospital for more aggressive therapy
Case # 5

34 year old white male with BP 150/100 documented on several occasions. Normal physical exam except HR 104 and appears very anxious. All lab normal including renal function. You have him take home BP for a week and it averages 145-160/95-105

How do you treat him?

- 1. Further observation for another 2 weeks.
- 2. Start alprazolam 0.25 mg bid
- 3. Start metoprolol succinate 100 mg daily
- 4. Start HCTZ 50 mg daily
- 5. Start Lasix 40 mg bid
- 6. Start lisinopril 20 mg daily
Case # 6

42 year old, normal weight, black female with BP 160/90 and already on HCTZ 50 mg daily, lisinopril 20 mg bid, labetalol 300 mg bid, and amlodipine 10 mg daily. Normal renal function and no history of CAD or diabetes. Has 600 mg protein in 24 hour urine. No peripheral edema.

How do you treat her?
(Assume she is placed on low sodium diet)

1. Add furosemide 40 mg bid
2. Increase amlodipine to 20 mg daily
3. Increase lisinopril to 40 mg bid
4. Add hydralazine 25 mg qid
5. Add doxazosin 4 mg daily
6. Add valsartan 160 mg daily
Case # 7

- 68 year old black male with history of recurrent CHF presents with SOB. EF is 20% but no history of MI. BP is 118/64, HR 52/min and he has 3+ PTE. Rales in both bases. GFR is 28 cc/min (S. creatinine 2.4) and he has 850 mg protein in 24 hour urine. Taking Lasix 80 mg bid, enalapril 20 mg bid and Coreg 25 mg bid.

How do you treat him?
(Assume he’s on low sodium diet)

- 1. Increase furosemide to 160 mg bid
- 2. DC carvedilol
- 3. Decrease carvedilol to 12.5 mg bid and lisinopril to 20 mg daily
- 4. Add metolazone 5 mg daily
- 5. Increase Lasix to 160 mg bid, decrease carvedilol to 12.5 mg bid and lisinopril to 20 mg daily.
- 6. Hospitalize to cautiously diurese him without causing hypotension and worsening renal function
Case # 8

82 year old white male, diabetic with proteinuria 1.5 grams, and previous MI 8 years ago. He has creat of 2.8 with GFR of 24 and last month they were 2.2 and 31 respectively. He is thin and frail. He has no edema or rales, but notes SOB with exertion. His BP is 152/62 and he says this is about what it is at home. His standing BP is 126/54. He notes dizziness when standing at times. During the last visit his BP was 164/74 and you had increased his amlodipine to 10 mg per day from 5 mg per day. Other BP Meds include lisinopril 40 mg bid, Lasix 40 mg bid and Coreg 25 mg bid. He is on a low sodium diet.

What do you do?

- 1. Nothing
- 2. DC Lasix
- 3. Decrease Lasix to 40 mg daily
- 4. Decrease amlodipine back to 5 mg daily
- 5. DC amlodipine
- 6. Ask Goldilocks
Using Simulation to Enhance Medical Education

Sarah White NRP, CHSOS
Simulation Specialist

Disclosures

- None
Brief History of Simulation: Link Trainer

Link Trainer at Freeman Field, Seymour Indiana. Freeman Field was a US Army Air Force field in World War II
What type of learners benefit from simulation?

- Simulation is a technique for practice and learning that can be applied to all disciplines and types of trainees.
- Used to replace and amplify real experiences with guided ones, often “immersive” in nature, that evoke or replicate substantial aspects of the real world in a fully interactive fashion.
Why is Simulation so important to Medical Education?

- Simulation offers scheduled, valuable learning experiences that are difficult to obtain in real life.
- Learners address hands-on and thinking skills including knowledge-in-action, procedures, decision-making, and effective communication.
- Learning opportunities can be scheduled at convenient times and locations and repeated as often as necessary.

Benefits of Simulation

- Simulation based medical education is a valuable tool for the safe delivery of healthcare practice.
- A simulated environment is safe and risk free for trainees to build competence and confidence.
The freedom to make mistakes and learn from them

- Teamwork conducted in the simulated environment may offer an additive benefit to the traditional didactic instruction, enhance performance and help reduce medical errors.

Prevention of medical errors

- 440,000 preventable medical errors happen each year.

- Cost $29 billion per year.

- 1 in 3 patients admitted to the hospital will experience some type of a preventable medical error.
Safety net:

- The simulation environment provides a safe environment for mistakes to happen as well as for those “mistakes” to be corrected before going into the clinical environment.

Learning experiences can be customized:

- Simulation can accommodate a range of learners from novices to experts.

- Beginners can gain confidence and “muscle memory” for tasks that then allow them to focus on the more demanding parts of care.

- Experts can better master the continuously growing array of new technologies from minimally invasive surgery and catheter-based therapies to robotics without putting the first groups of patients at undue risk.
Controlled simulations can be immediately followed by audio/video supported debriefings or after-action reviews that richly detail what happened.
Simulation Technology:

- High Fidelity Manikins
- Standardized Patients
- Task Trainers
- Hybrid Simulations
- Virtual Reality
Simulation is a vital part ACLS & BLS Competencies in Oklahoma.

Contact Info: MedSim@Okstate.Edu
A History of Systemic Thrombolysis for Stroke: Can We Trust the Clinical Guidelines?

Aaron Lane D.O.
Clinical Associate Professor of Emergency Medicine
OSU-CHS

Thrombolytics for Stroke

- Considered “settled science” and de facto standard of care.
- Code strokes, documentation mandates, stroke centers etc
- Guideline update from Dec 2015 recommend ever expanding inclusion criteria for thrombolysis.
- Age > 80 no longer reason to withhold thrombolysis
- Stroke severity (mild or severe) no longer a reason to withhold thrombolysis.
- Rapidly improving Sxs no longer a reason to withhold thrombolysis.
- Softens thrombolysis rec in recent surgical pts, recent MI pts, recent CVA pts and recent trauma pts.
- Ok to use thrombolytics in pts w/ incidental aneurysms?
- ESRD pts?, demented pts?, cancer pts?
- Hypo & hyperglycemia?
- Early CT findings?
- Recent LP?
- Psychogenic/Conversion/Malingering?

Consent for the Incompetent Patient

- “In an emergency when the patient is not competent and there is no immediately available legally authorized representative to provide consent, it is recommended to proceed with IV alteplase in an otherwise eligible patient with acute ischemic stroke”
YOU GET TPA, YOU GET TPA

EVERYONE GETS TPA
How did we get here?

- Multiple trials have demonstrated a small but important benefit in mortality for STEMI pts treated with thrombolytics.

- Thrombolytics?
  - tPA
  - Streptokinase
    - Most data comparing these two drugs for MI did not demonstrate any difference in pt important outcomes

---

Thrombolysis in Myocardial Infarction (TIMI)
Trial, Phase I: a comparison between intravenous tissue plasminogen activator and intravenous streptokinase*

Clinical findings through hospital discharge

J. H. CHESEBRO, M.D., G. KNATTERUD, PH.D., R. ROBERTS, M.D., J. BORER, M.D.,
L. S. COHEN, M.D., J. DALEN, M.D., H. T. DODGE, M.D., C. K. FRANCIS, M.D.,
D. HILLIS, M.D., P. LUDBROOK, M.D., J. E. MARKIS, M.D., H. MUELLER, M.D.,
E. R. PASSAMANI, M.D., E. R. POWERS, M.D., A. K. RAO, M.D., T. ROBERTSON, M.D.,
A. ROSS, M.D., T. J. RYAN, M.D., B. E. SOBEL, M.D., J. WILLERSON, M.D.,
D. O. WILLIAMS, M.D., B. L. ZARET, M.D., AND E. BRAUNWALD, M.D.

- Stopped early
- At 90 min 60% of tPA group had reperfusion compared to 35% of streptokinase group
- Reperfusion is not a clinical outcome, and there were no differences in clinical outcomes.
- Initially there were plans to do a 2nd study examining clinically important outcomes (mortality) → never happened, WHY?
• Dr Elliot Grossbard MD a Genentech scientist
  – “We don’t know how another trial would turn out. And if we don’t come out ahead, we would have a tremendously self-inflicted wound...another study may be a good thing for America, but it wasn’t going to be good for us.”
As you review these studies pay attention to:

- Thrombolytic agent
- Dose
- Timing interval
- Rate of intracranial hemorrhage (ICH)

Randomised controlled trial of streptokinase, aspirin, and combination of both in treatment of acute ischaemic stroke

Multicentre Acute Stroke Trial—Italy (MAST-I) Group

- Randomized, multicenter trial
- Enrolled 622 pts presenting within 6 hours of stroke onset
- Streptokinase 1.5 million units vs no treatment
- Primary outcome was death and disability at 6 months (Modified Rankin of 3-6)
- Trial stopped early due to harm
- Goal was to enroll 1,500 patients
- No difference of death/disability at 6 months (63% vs 65%)
- Mortality increased (36% with streptokinase and 24% without treatment)
Intravenous Thrombolysis With Recombinant Tissue Plasminogen Activator for Acute Hemispheric Stroke
The European Cooperative Acute Stroke Study (ECASS)

- Randomized, double blind, placebo controlled, multicenter trial
- 620 pts with moderate to severe stroke without CT changes presenting within 6 hrs
- Compared tPA at 1.1mg/kg vs placebo
- Two primary outcomes (designed to look at functional outcomes at 90 days)
- Results = NO DIFFERENCE in either disability scale at 90 days
- Mortality higher in tPA group (17.95 vs 12.7%)

Part 1 Primary Endpoint – > 4 point improvement in NIHSS at 24 hrs
- N = 291
- tPA – 67/144 (47%) with primary endpoint
- Placebo 57/147 (39%) with primary endpoint
- P value of 0.21 (not significant)
- No significant difference at 24hrs with thrombolysis
- Part 2 Primary Endpoint – Improvement in stroke scale (Barthel Index, mRS, Glasgow Outcome Score and NIHSS) at 90 days
- N=333
- Regardless of which stroke scale you looked at, tPA patients did better.
- <2 mRS at 90d 26% placebo vs. 39% tPA (13% absolute benefit)
- NNT=8
NINDS Criticisms

• Industry influence
• Baseline imbalance-> placebo group had more severe strokes
• No mortality benefit
• No control for post-thrombolytic therapy
• Issues with the 3 hour window:
  — benefit for up to 3 hours biased by 50% of the patients having thrombolysis <90 minutes
  — <90 min OR 1.71 (1.06-2.7)
  — 91-180 min OR 1.12 (0.71-1.76) (not significant)

Modified Rankin Scale

<table>
<thead>
<tr>
<th>Modified Rankin Scale (MRS)</th>
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<tr>
<td>0  No symptoms</td>
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<tr>
<td>1  No significant disability; despite symptoms; able to perform all usual duties and activities</td>
</tr>
<tr>
<td>2  Slight disability; unable to perform all previous activities but able to look after own affairs without assistance</td>
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<tr>
<td>3  Moderate disability; requires some help, but able to walk without assistance</td>
</tr>
<tr>
<td>4  Moderately severe disability; unable to walk without assistance and unable to attend to own bodily needs without assistance</td>
</tr>
<tr>
<td>5  Severe disability; bedridden, incontinent, and requires constant nursing care and attention</td>
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<tr>
<td>6  Death</td>
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Reliability of the Modified Rankin Scale
A Systematic Review

Terence J. Quinn, MRCP; Jesse Dawson, MRCP; Matthew R. Walters, MD; Kennedy R. Lees, MD

Background and Purpose—A perceived weakness of the modified Rankin Scale is potential for interobserver variability. We undertook a systematic review of modified Rankin Scale reliability studies.

Methods Two researchers independently reviewed the literature. Cross disciplinary electronic databases were interrogated using the following key words: Stroke®; Cerebrovascular; Modified Rankin; Rankin Scale®; Oxford Handicap®; Observer variation®. Data were extracted according to prespecified criteria with decisions on inclusion by consensus.

Results—From 3461 titles, 10 studies (587 patients) were included. Reliability of modified Rankin Scale varied from weighted $k = 0.95$ to $k = 0.25$. Overall reliability of mRS was $k = 0.46$; weighted $k = 0.90$ (modified traditional Rankin Scale) and $k = 0.62$; weighted $k = 0.87$ (structured interview).

Conclusion—There remains uncertainty regarding modified Rankin Scale reliability. Interobserver studies closest in design to large-scale clinical trials demonstrate potentially significant interobserver variability. (Stroke. 2009;40:3393-3395.)

Key Words: clinical trials • clinimetrics • modified Rankin Scales • outcome assessment • systematic review

The New England Journal of Medicine

THROMBOLYTIC THERAPY WITH STREPTOKINASE IN ACUTE ISCHEMIC STROKE

The Multicenter Acute Stroke Trial — Europe Study Group

- Used a six hour time frame, streptokinase VS placebo
- Primary outcome was a binary criterion combining mortality and severe disability at six months (Modified Rankin Score of 3 or higher)
- Stopped early due to increased mortality and increased ICH
ASK trial
- Used a 4 hour time frame
- Streptokinase VS placebo
- Primary outcome was death and disability at three months.
- Thrombolysis within 4 hours of acute stroke onset increased mortality at 3 months
- Treatment within 3 months of stroke was safer and associated with better outcomes than later treatment, but no significant benefit over placebo.

1998 ECASS II trial
- Alteplase for acute ischemic stroke given within 6 hr of symptom onset
- Randomized double blinded placebo controlled
- Primary endpoint was disability at 90 days using a dichotimized Modified Rankin Scale (favorable score 0-1 & unfavorable 2-6)
- No difference in favorable outcomes at 3 months
- Treatment differences were similar whether pts were treated within 3 hours or 3-6 hours.
Recombinant Tissue-Type Plasminogen Activator (Alteplase) for Ischemic Stroke 3 to 5 Hours After Symptom Onset
The ATLANTIS Study: A Randomized Controlled Trial
Wayne M. Clark, MD; Stanley Wissman, MD; Gregory W. Albers, MD; et al.

ATLANTIS B

- 1999
- Placebo-controlled, randomized, double blinded
- Sough to determine efficacy of alteplase administered to acute ischemic stroke pts presenting 3-5 hours after symptom onset.
- Favorable outcome at 3 months, (32% of placebo and 34% of thrombolytic pts P=0.65)
- No differences in any secondary functional outcome measures
- Alteplase significantly increased the rate of ICH
- Mortality at 90 days was 6.9% in placebo group and 11% in the alteplase group.
ATLANTIS - A

- Trial started in 1991
- Placebo controlled, double blind, randomized study comparing alteplase to placebo for acute ischemic stroke pts presenting within 6 hrs.
- Primary endpoint was the # of pts with a decrease in the NIHSS of 4 or more at 24 hours, and day 30, along with infarct volume at 30 days.
- Stopped in 1993 by the safety committee
- In Dec 1993 the study was restarted and the time frame was changed 6 hours to 5 hours → PART B.
- Part A = results of the original study that was stopped.
ATLANTIS-A

• Higher percentage of alteplase pts had a 4 point improvement in the NIHSS at 24 hours (24% vs 40%).
• This early effect was reversed at 30 days with more placebo pts having a 4 point improvement (75%) than pts treated with alteplase (60%)
• Alteplase significantly increased the risk of ICH within the first 10 days (11% vs 0%)
• Mortality at 90 days was 23% for alteplase pts and 7% for placebo.

Stroke

The Desmoteplase in Acute Ischemic Stroke Trial (DIAS)
A Phase II MRI-Based 9-Hour Window Acute Stroke Thrombolysis Trial With Intravenous Desmoteplase

Werner Hacke, MD; Greg Albers, MD; Yasir Al-Rawi, MD; Julien Bogousslavsky, MD; Antonio Davalos, MD; Michael Eliaziw, PhD; Michael Fischer, PhD; Anthony Furlan, MD; Markku Kaste, MD; Kennedy R. Lees, MD; Mariola Soehngen, MD; Steven Warach, MD; for The DIAS Study Group

- 2008
- Placebo controlled, double-blinded, randomized, dose finding phase 2 trial
- Eligibility → NIHSS of 4 – 20 with MRI evidence of diffusion/perfusion
- The dose finding phase was prematurely terminated due to increased ICH
- Favorable 90 day outcomes was found in 22% of placebo pts and 13% of desmoteplase treated pts.
The benefits and harms of intravenous thrombolysis with recombinant tissue plasminogen activator within 6 h of acute ischaemic stroke (the third international stroke trial [IST-3]): a randomised controlled trial

The IST-3 collaborative group*

- 2012 study
- A multicenter open-label, randomized, controlled trial
  Patients: 3035 adult patients with acute stroke within 6 hours of symptom onset. Patients were excluded if they “had a clear indication” for t-Pa and if there was a clear contraindication. Then, only if both the physician and the patient thought that the treatment was “promising, but not proven” would the patient be enrolled. 53% of the patients were older than 80 (excluded from other trials.)
- Intervention: t-Pa 0.9mg/kg
- Comparison: standard care
- Primary outcome: Proportion of patients alive and independent at 6 months

IST-3

- There was no difference in the primary outcome: 35% of the placebo group and 37% of the tPa group were alive and independent at 6 months.
- Mortality at 6 months was unchanged (27% vs 27%, p=0.672)
- Mortality was increased at 7 days with t-Pa (11% vs 7%, OR 1.59, 95%CI 1.23-2.07, p=0.0004).
- Symptomatic intracranial hemorrhage was increased with t-Pa (7% vs 1%, p<0.0001).
IST - 3

- Largest thrombolytic for stroke trial
- Worst methods → bias towards tPA group but still no treatment benefit demonstrated.
- Follow-up was by mail
- 3 hr subgroup did better, but the 3 – 4.5 hr group did much worse, while the 4.5 -6 hr group did better again = CHANCE

The NEW ENGLAND JOURNAL of MEDICINE

Thrombolysis with Alteplase 3 to 4.5 Hours after Acute Ischemic Stroke

Werner Hacke, M.D., Markku Kaste, M.D., Erich Bluhmke, Ph.D., Miroslav Broznan, M.D., Antoni Dávalos, M.D., Donata Guidetti, M.D., Vincent Larrue, M.D., Kenneth R. Lees, M.D., Zsuzsanna Medeghri, M.D., Thomas Machning, M.D., Dietmar Schneider, M.D., Rüdiger von Kummer, M.D., Nils Wahlgren, M.D., and Danilo Tosi, M.D., for the ECASS Investigators*

- ECASS III Trial
- A multicenter, placebo controlled, double-blind, randomized trial
- 821 adult stroke patients (aged 18-80) who were able to received the drug with a 3-4 hours time frame after symptom onset (later extended to 3-4.5 hours). They excluded patients with a NIHSS >25
- tPA 0.9mg.kg
ECASS III

- Primary outcome: Disability at 90 days (looking at a modified Rankin scale 0-1)
- More people in the treatment group ended up with a favourable modified Rankin score (0-1): 52.4% with t-Pa vs 45.2% with placebo.
- There was not a statistically significant difference in the Glasgow outcome scale or the Barthel index between the two groups.

ECASS III

- Mortality was unchanged: 7.7% with t-Pa and 8.4% with placebo, p=0.68
- Symptomatic hemorrhage was higher. 2.4% vs 0.2%
  - According to the NINDS definition, 7.9% vs 3.5%.
NINDS Concerns

• Aug 2000 AHA upgraded its recommendation of alteplase for stroke from optional to recommended.
  – Most randomized control trials showed no benefit or harm.
  – Validity of NINDS trial was questionable because the proportion of pts enrolled in 0-90 min group was artificially increased due to study design.
  – Chance alone could explain the benefit found in this trial.

NINDS Concerns

• Efficacy in expert hands is not the same as effectiveness in usual clinical practice.
• 20% of pts initially Dx’d with stroke by expert stroke teams were subsequently found to not have a stroke.
• “Selective emphasis of a single study is scientific folly.”
Repeat the Trial!!!!!!

• “There are numerous examples in medicine where a single small study (or even a few studies) seemed to support a promising hypothesis but subsequent larger work failed to confirm that benefit (or even cause significant harm).”

• It took 8 years and a Freedom of Information Act Request through the FDA to obtain raw data from the NINDS trial.
AHA Conflicts of Interest

• Minutes of the AHA Board of Directors meeting reveal that Genentech contributed $2.5 million to build the AHA headquarters.
• Genentech has given over $11 million to the AHA in the last decade.
• 2000 AHA Stroke Guidelines were adopted by a panel of 9 experts.
  – 8 of 9 supported the guidelines
  – Four panelists received lecture fees as member of Genentech speakers bureau.
  – One served as a consultant to Boehringer-Ingelheim (development and marketing partner of Genentech.
  – 2 received research funding from Genentech
- Dr Jerome Hoffman MD was the lone dissenter, and also had no industry ties.
- After providing expert testimony at the conference he was asked to provide written commentary providing the basis of his dissent.
- He submitted his paper 1 year before the guideline were released but it was never published and the guidelines never mentioned it.

• A study to verify the outcomes of NINDS could benefit the public, it could only harm those who stand to financially.

• Remember Dr Grossbard's comments!
March 1, 2000

Use of Tissue-Type Plasminogen Activator for Acute Ischemic Stroke
The Cleveland Area Experience

Irene L. Katzne, MD; Anthony J. Furlan, MD; Lynne E. Lloyd, MBA; et al

- 29 hospitals in 3 counties
- 3948 pts w/ primary Dx of acute ischemic stroke
- Used NINDS inclusion/exclusion criteria and 3 hour time frame
- Alteplase
- 70 pts (1.8%) received tPA
- 11 pts (15.7%) had symptomatic ICH, 6 of which were fatal
- 50% had deviation from NINDS treatment guidelines
- Inpatient mortality was 15.7% for tPA pts and 5.1% in pts that were not lysed

• “There is a treatment we sometimes use for stroke that is supposed to break down the clot causing the stroke. The treatment is controversial, and you will probably hear different things from different doctors. The issue is that out of 12 major trials, only 2 have shown benefit, and both of those trials have some problems, and they were both paid for by the people who make the drug. There are some risks that we’re certain about: about 1 in 12 patients will have severe bleeding resulting in worse neurologic outcome. Despite that risk, in the best case scenario, about 1 in 10 people given this drug early will have a noticeable improvement in their function after 3 months. Unfortunately, it isn’t clear how reliable the science has been, and we don’t know which patients have the greatest chance at benefit or harm. The choice to receive this medication remains up to each individual patient.”
Not Just Genentech and AHA!

- American Cancer Society – sponsored by AstraZeneca, Johnson & Johnson, Bristol-Myers Squibb, and Eli Lilly
- National Alliance of the Mentally Ill → Eli Lilly (manufactures >17 psych drugs) donated $11.72 million.
Obstetrical Emergencies - What We Know

Corey R. Babb, D.O., FACOOG, IF
Clinical Assistant Professor of Obstetrics and Gynecology
Oklahoma State University College of Osteopathic Medicine

Financial Disclosures

- Speaker’s Bureau: Valeant Pharmaceuticals
• Define obstetrics emergencies
• Discuss specific conditions
  ◦ Antepartum, Intrapartum, Postpartum
• Develop management protocols for emergent situations in Obstetrics
• Obstetrical emergencies are life-threatening medical conditions that occur any point during pregnancy.
• Greater prevalence during labor and delivery
• Multiple risk factors
  ◦ Genetics, trauma, environmental, comorbidities, etc...

Definitions

• 830 women die everyday from OB-related emergencies
• 99% in third-world countries
  ◦ Sub-Saharan Africa
  ◦ Rural communities
• USA = 26/100,000 live births
  ◦ Worst statistic in “developed world”
  ◦ Rate is increasing!
Why is this Happening?

- Hospital Issues?
  - Lack of equipment, supplies, personnel
- Access to Care?
  - 20,000 OB/GYNs in USA
  - 50,000,000 reproductive age women (2010)
  - Onus falls on non-OB providers
- Alternative Birthing Community?
  - Homebirths gaining popularity
  - No standardized training for homebirth attendants
- Lack of Funding for Initiatives?
  - Only 6% of grants for Maternal/Child go to maternal health
This is a Big Problem!

Specific Conditions
Conditions

- Antepartum
  - Eclampsia
  - Third-trimester bleeding
- Intrapartum
  - Cord prolapse
  - Uterine rupture
  - Amniotic fluid embolism
  - Shoulder dystocia
- Postpartum
  - Postpartum hemorrhage

Eclampsia
• Definition
  ◦ Sequelae of Preeclampsia
    • Elevated BP, +/- proteinuria, +/- EOD
    • Tonic-clonic seizures with postictal state
• Diagnosis
  ◦ Clinical – may be found in postictal state by family member
• Treatment
  ◦ Magnesium Sulfate 4-6g IV/IM
  ◦ Ativan 2-4mg IM
  ◦ Stabilize mother, then deliver as indicated

Eclampsia Con’t

Third-Trimester Bleeding
Third-Trimester Bleeding Cont’d

- Definition
  - Bleeding in third trimester
  - Statistically either Placenta Previa (0.5%) or Placental Abruption (1%)

- Diagnosis
  - US for placenta Previa
    - Painless vaginal bleeding
  - Clinical for Placental Abruption
    - Painful vaginal bleeding
  - N.B. Term uterus 500ml/min blood flow

Third-Trimester Bleeding Cont’d

- Treatment
  - Placenta Previa
    - Cesarean delivery required
    - If stable, consider transfusion, then delivery
  - Placental Abruption
    - May deliver vaginally if “close to delivery”
    - Often emergent cesarean delivery
    - May consider transfusion if stable
**Umbilical Cord Prolapse**

- **Definition**
  - Prolapse of umbilical cord to or out of cervical os
  - Occult vs. Presenting prolapse

- **Diagnosis**
  - Clinical – felt with amniotomy, or on vaginal exam

- **Treatment**
  - Reduction of cord
    - Assistant’s hand/foley balloon
  - Emergent Delivery
    - Do not replace and continue with laboring
Uterine Rupture

Definition
- Rupture of the uterine wall
- May be partial or complete
- 60% fetal mortality

Diagnosis
- Fetal bradycardia, loss of uterine tone, ascension of presenting part
- Partial ruptures found with scheduled C/S

Treatment
- Cesarean delivery of fetus
- May attempt to repair uterus
- Hysterectomy often required
Definition
- Vascular ingress of amniotic fluid
- 50-80% maternal mortality
  - Greater 85% neurologic injury
- Significant cardiovascular collapse
- Possible anaphylactic response

Diagnosis
- Clinical – rapidly decreasing VS, maternal hypotension, bradycardia
- Leads to hemorrhage/DIC if initially survives
Amniotic Fluid Embolism Con’t

- Treatment
  - Rapid delivery of fetus
  - ACLS with uterine displacement
  - Mass transfusion protocol if available
    - If not, be prepared for multi-product transfusion
    - >20 products often needed
  - Hysterectomy indicated
  - ICU transfer
  - Prepare for DIC – approximately 2hr time of onset

Shoulder Dystocia
• Definition
  ◦ Cessation of fetal descent due to entrapment of anterior shoulder against pubic bone
  ◦ Risk factors: DM, macrosomia, teratologies, short stature, obesity
• Diagnosis
  ◦ Clinical – Turtle sign, failure of internal rotation
• Treatment
  ◦ See algorithm
Postpartum Hemorrhage

- Definition
  - Estimated blood loss of greater than 500ml/1000ml after vaginal/cesarean delivery
  - More than 60% maternal deaths worldwide
- Diagnosis
  - Pad counts, lap sponges, EBL measurement usually inaccurate
- Treatment
  - Depends on underlying condition...

Postpartum Hemorrhage Con’t
### Interventions
- **Anatomic**
  - Fundal pressure, bimanual massage, Bakri balloon
- **Pharmacologic**
  - Uterotonics – pitocin, methergine, hemabate, cytotec
  - Blood products
- **Surgical**
  - Uterine artery ligation
  - B-lynch
  - Hysterectomy
Plan for Emergencies
- Develop Drills
- Postpartum hemorrhage cart
- Early detection is key

Triage protocol
- See next slide

Education of non-OB personnel about emergent conditions
We’re not doing enough!

Maternal Mortality Ratio per 100,000 Live Births, 2005-2014

What do we know?
Thank you!

- Call or email anytime!
- 918-586-4500 clinic
- Corey.Babb@okstate.edu
ADDICTION – CHANGING OUR ASPECT OF PRACTICE

Natasha N. Bray, DO, MSEd
Visiting Clinical Associate Professor of Rural Medicine – Internal Medicine
2016 – 899 Oklahomans died from drug overdose

**Contributions of Selected Causes of Death to the Change in Life Expectancy in the United States, 2000-2015**

- Drug poisoning deaths increased from 47,415 in 2000 to 52,404 in 2015
- Drug poisoning deaths contributed to a loss of .28 years (102 days) in life expectancy
- Drug poisoning deaths due to opioids contributed to a loss of .21 years (76 days) in life expectancy

<table>
<thead>
<tr>
<th>How comfortable are you diagnosing and treating patients with substance use disorders?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Not comfortable at all – I prefer not to ask my patients about substance use</td>
</tr>
<tr>
<td>2. Somewhat comfortable – I have screening tools and use them if the patient brings up the subject</td>
</tr>
<tr>
<td>3. Very comfortable – I routinely ask about substance use</td>
</tr>
<tr>
<td>4. N/A to my practice</td>
</tr>
</tbody>
</table>
The Myth of Addiction

- “For me the most educational experience of the past three decades was to learn that the traditional image of the addict (weak character, hedonistic, unreliable, depraved, and dangerous) is totally false. This myth, believed by the majority of the medical profession and the general public, has distorted public policy for seventy years.”

  - Dr. Vincent P. Dole

Prevalence of Addiction

- 15.9% (40.3 million) with addiction
- More than heart conditions (27.0 million), diabetes (25.8 million), or cancer (19.4 million)
- 22 million with alcohol or drug use disorder
2013

24.6 million (9.4%) Americans aged 12 or older had used an illicit drug in the past month.

2002 – 8.3%

Drug use is highest among people in their late teens and twenties
Opioid Epidemic

- Rising prevalence of opioid use disorder
- Overdose deaths quadrupled since 1999
- Nearly half of new heroin users report using prescription opioids first
- Report switching to heroin because it’s cheaper and easier to obtain than prescription opioids


Past Month and Past Year Heroin Use in Persons Aged 12 or Older

Alcohol

% of adults aged 18 and over who had at least 1 heavy drinking day in the past year, by sex: US, 1997-2016

Alcohol

% of adults aged 18 and over who had at least 1 heavy drinking day in the past year, by age group and sex: US, 2016


Mortality

Tobacco/nicotine, alcohol & other drugs:

* Estimated 640,000 deaths each year in US

* Approximately 24% of all deaths in the US

Deaths from MVA – 32,675 (1.2%)
Deaths from Gunshot Wounds – 33,636 (1.3%)

https://www.cdc.gov/nchs/fastats/deaths.htm
For every 1 opioid overdose death in 2010 there were...

- 15 abuse treatment admissions
- 26 emergency room visits
- 115 who abuse/ are dependent
- 733 nonmedical users

$4,350,000 in healthcare-related costs

Cost of Addiction

Illegal Drugs: $181 billion/year
Alcohol: $185 billion/year
Tobacco: $193 billion/year
**Total: $559 billion/year**

As well as Emotional, Medical, Legal, Personal, Social costs...
**Purdue Pharma**

- Introduced OxyContin in 1995
- Funded >20,000 pain-related educational programs between 1996 – 2002
- Provided financial backing to:
  - American Pain Society
    - “Pain is the 5th Vital Sign”
  - Joint Commission → accredits healthcare organizations, physicians and patient groups

---

**Good Intentions Gone Wrong**

- Late 90’s – Physicians were pressured to address “pain as the 5th vital sign”
- Doctors were told:
  - “opioids aren’t addictive”
  - “treating chronic pain long-term with opioids is evidence-based”
  - both **FALSE**
- Some ‘bad apples’ (misprescribing, financial benefits, etc) → minority
- Doctors learn very little about pain management in medical school
- FAR LESS training on addiction
Addiction

80% of young people will experiment with drugs or alcohol

“The question is frequently asked: Why does a man become a drug addict? The answer is that he usually does not intend to. [The drug] wins by default. I tried it as a matter of curiosity... I ended up hooked. You don’t decide to be an addict. One morning you wake up sick and you’re an addict.”

- William S. Burroughs, Junky (1953)

Natural History of Opioid Use Disorder
**Addiction**

- Primary, **chronic brain disease** characterized by **compulsive drug seeking** and use **despite harmful consequences**
- Involves **cycles** of relapse and remission
- 40-60% genetic
- Without treatment, addiction is progressive and can result in disability or premature death

**The 4 C's of Addiction:**
- **Loss of Control**
- **Compulsive use or Craving**
- **Continued use despite adverse Consequences**

---

**DSM V Criteria: Substance Use Disorder**

- Use in larger amounts or for longer periods of time than intended
- Unsuccessful efforts to cut down or quit
- Excessive time spent using the drug
- Intense desire/urge for drug (craving)
- Failure to fulfill major obligations
- Continued use despite social/interpersonal problems
- Activities/hobbies reduced given use
- Recurrent use in physically hazardous situations
- Recurrent use despite physical or psychological problem caused by or worsened by use
- Tolerance
- Withdrawal

---

Addiction Changes Brain Structure & Function
3 Stages of the Addiction Cycle & the Brain Regions Affected

- **Binge/Intoxication**: Motivation, Reward/Pleasure, Habits, Learning behaviors
  - Basal Ganglia
  - Amygdala

- **Preoccupation/Anticipation**: “Executive Function”
  - Decision-making
  - Time-Management
  - Organizing thoughts

- **Withdrawal/Negative Affect**: Reactions to stress
  - “fight or flight”
  - Negative emotions (anxiety, irritability)

Visualizing Recovery

Brain Recovery with Prolonged Abstinence

A Treatable Disease

Why is addiction treatment evaluated differently?

They both require ongoing care.

Detoxification

- Patient is weaned off their dependence on opioids slowly
- Relapse rates post-detox alone are >90%

Medication Saves Lives

HIV-related deaths

- First NRTI (Retrovir) launched
- First NNRTI (Viramune) launched
- First PI (Invirase) launched
- Impact of HAART
- First Ei (Fuzeon) launched

HIV discovered

First NRTI+NRTI combination (Combivir) launched

First NRTI+NRTI +NNRTI combination (Atripla) launched

NOT TREATMENT
Heroin Overdose Deaths & Opioid Agonist Treatment: Baltimore, MD, 1995-2009

50% reduction in overdose death with opioid agonist treatment


Impact of Buprenorphine in France

79% reduction in overdose death with opioid agonist treatment

Poor Outcomes Without Maintenance

Control group:
• 0% retained in treatment
• 20% died (N=4)

Treatment group:
• Highly significant ASI reduction
• 75% negative tox screens
• 75% retained in treatment
• No deaths

Benefits of Methadone Maintenance

• Reduces risk of HIV by ~6x
• Reduces Hepatitis C & B transmission
• Increases rates of employment
• Reduces criminal activity after 6 months or more of treatment
• Reduces illicit opioid use by 40-70%
• Increases length of life for patients with opioid addiction
• Reduces opioid overdose death rates by 40-60%

Detoxification
• Patient is weaned off their dependence on opioids slowly
• Relapse rates post-detox alone are >90%

Maintenance
• Indefinite therapy
• 3 aims:
  1. Prevents withdrawal
  2. Keeps patient comfortable by reducing cravings
  3. “Blocks” effects of illicit opioids

NOT TREATMENT
Pathway to Recovery

Lack of Access to Treatment
• 8% of treatment programs offer methadone or buprenorphine
• 3% of physicians waivered to prescribe buprenorphine
• 2.3 million opioid use disorder, yet maximum opioid-agonist tx slots = 1.4 million
• In rural areas, access is even worse
  - Wait time for methadone maintenance in Vermont and Kentucky is 2 years!

NIDA Http://archives.drugabuse.gov/bupupdate.html
How would you characterize your approach to addiction and addiction treatment?

A. Addiction is different from other chronic diseases because people who use drugs or alcohol are making a choice.
B. Patients with addiction have to want to get better so treatment should not be prioritized over treatment for diseases such as diabetes or heart disease.
C. Addiction is a chronic disease with successful outcomes when treatment is patient-centered and similar in approach to diabetes or heart disease care.
D. Addiction is similar to other chronic diseases except using drugs is a crime and should be punished.
Lack of Treatment for Patients with Opioid Use Disorder

- Risk of death waiting for care
  - Comparison of patients accepted into treatment vs. those continuing on a waiting list
  - Risk of death for those on waiting list was 10 times higher than for those who were accepted into care

Medications for Addiction

- “What it comes down to is that we take care of the pharmacological problems, leaving the addict, and everyone else, free to turn his attention to other problems. It does not strike me as relevant whether these patients get off methadone. Some may want to and that’s fine. What is relevant is that a treatment can be developed so that the addict can become a socially useful citizen, happy in himself and in society.”
  - Dr. Marie Nyswander. The New Yorker (1965)
Myths: They’re Still “Addicted”

“But they’re still addicted……”

“That is like saying a diabetic is addicted to insulin... These people are no longer addicts in the sense that an addict is someone involved in the compulsive self-administration of narcotics. They’re being given medicine by a doctor. There is every possibility, from what we know so far, that the pharmacology of a real addict makes it necessary for him to have drugs to function, just as a diabetic requires insulin.”

- Dr. Marie Nyswander. The New Yorker (1965)

Stigma Around Medication

“But it’s immoral giving somebody drugs....”

“Tell me, is a molecule of methadone more immoral than a molecule of insulin? Look if you can make it off anything, more power to you. But if you can’t don’t confuse medication with immorality.”

- Dr. Marie Nyswander. The New Yorker (1965)
Evidence and Practice Gap

“[The] profound gap between the science of addiction and current practice... is a result of decades of marginalizing addiction as a social problem rather than treating it as a medical condition. Much of what passes for “treatment” of addiction bears little resemblance to the treatment of other health conditions.”

The Trouble with Tough Love

“...I have never understood the logic of tough love. I took drugs compulsively because I hated myself, because I felt as if no one – not even my family – would love me if they really knew me.

How could being “confronted” about my bad behavior help me with that? Why would being humiliated, once I’d given up the only thing that allowed me to feel safe emotionally, make me better? My problem wasn’t that I needed to be cut down to size; it was that I felt I didn’t measure up.

In fact, fear of cruel treatment kept me from seeking help long after I began to suspect I needed it.”
What if…

• What if we treated other diseases the way we treat addiction?

What if…

• You go to the hospital with chest pain and are found to be having a heart attack
  - Told its “Your Fault” because of your “Choices”
  - Denied treatment because you “did it to yourself”
  - Given a list of cardiologists to call
  - Only given aspirin if you agree to go to counseling
  - Kicked out of the hospital to experience more chest pain
**Current Treatment for SUDs**

- Everyday experience of patient who seek treatment:
  - Told its “Your Fault” because of your “Choices”
  - Denied treatment because you “did it to yourself”
  - Given a list of addiction treatment centers to call
  - Only given buprenorphine or methadone if you agree to go to counseling
  - Kicked out of the hospital if relapse occurs

---

**What if...**

- We treated addiction the way we treat diseases?
What If…

• Only prerequisite for treatment is having SUD
• Treatment on demand
• Care triaged based on who needs it the most
• Not fired for having symptoms of their disease (i.e., relapse)
• Encouraged to go on medications
• Offered a menu of treatment options

Stigma and Addiction

Stigma top reason for not accessing treatment
- 22 million Americans with substance use disorder
- Only 10% access treatment
• Stigma associated with poor mental and physical health among people who use drugs
• WHO study of 18 most stigmatized social problems in 14 countries:
  - Drug addiction ranked number 1
  - Alcohol addiction ranked number 4
What is Stigma?

• Attribute, behavior, or condition that is socially discrediting

• Two main factors influence stigma:
  - Cause and Controllability

• Stigma decreases when:
  - “It’s not his fault”
  - “She can’t help it”

Despite evidence for genetics and brain changes, stigma is pervasive...
Abuse: “Wicked act or practice, a shameful thing, a violation of decency”

- Associated with behavior such as rape (sexual abuse), domestic violence, and child molestation
- Professionals more likely to view patient as deserving of punishment if described as a “substance abuser”


Types of Stigma for Addiction

- Stigma from within
  - Blame self, feel hopeless
- Stigma from recovery community
  - Medications vs. abstinence
- Stigma from clinicians
  - Belief that treatment is ineffective
- Stigma from outside
  - Choice vs. disease

Impact of Stigma

- Erodes confidence that addiction is a valid and treatable health condition
- Barrier to jobs, housing, relationships, medical care
- Deters public from wanting to pay for treatment, allows insurers to restrict coverage
- Stops people from seeking help
Break the Silence

• “There is no simple solution. On the most basic level, stigma prevention involves people speaking out. There is power in people telling their stories. Perceptions can change. Attitudes can shift. Behaviors can be modified. Knowledge can be increased.”

Celebrating Any Positive Change

• “If our goal is to promote health and reclaim lives, then we must understand the direct and sometimes circuitous paths through which individuals and families achieve and sustain such health. We must meet each individual and family with fresh eyes in every encounter with a belief that each encounter is an opportunity for movement, no matter how small, towards health and wholeness.”

  - Arthur C. Evans, Jr., 2013
Take-Home Points

- Addiction is a **chronic medical disease**, a disease of the brain (NOT a sign of moral weakness or failure)
- Most people with addiction, once connected to the appropriate treatment & recovery services, GET BETTER
  - **Stigma** towards people with addiction acts as a **barrier to care**.
  - More addiction prevention and treatment strategies are needed.
  - Addiction is costly but preventable.
  - **MAT** SAVES LIVES.

Addiction References

- American Society of Addiction Medicine (ASAM)
- Centers for Disease Control and Prevention (CDC)
- Center for Mindfulness, Umass Medical School
- Harm Reduction Coalition (HRC)
- National Institute of Drug Abuse (NIDA)
- Providers’ Clinical Support System for MAT (PCSS-MAT)*
- The National Center on Addiction and Substance Abuse*
- Substance Abuse and Mental Health Service Administration (SAMSHA)

* Excellent online learning modules, webinars
Project ECHO

Addiction Medicine -
Mondays @12:00 PM CST