Practical Pharmacology:

Treatment of Tobacco Dependency
Objectives

- Demonstrate the addictive aspect of smoking
- Describe all currently available smoking cessation medications, including dosing and usage recommendations
- Briefly review efficacy of other treatment modalities
What is Smoking?

- Physical Addiction
- Habit/Behavioral
- Psychological Dependence
Treating Each Aspect

- Physical Addiction
  - Cessation Medications
- Habit/Behavioral
  - Coping
- Psychological Dependence
  - Distinguish Myth vs. Reality
Physical Addiction
What is a Cigarette?

• Drug Delivery System
  – Designed to deliver a specific amount of nicotine
  – Design components:
    • Filter
    • Porosity of paper
    • Burn Rate
    • pH of smoke
Other Characteristics

• Brand Specific
  – Amount of Tar/CO/Nicotine
  – Low nicotine cigarettes a sham

• Individual variations
  – Amount of inhalation
  – Depth of inhalation
  – Duration of inhalation
Physical Addiction

- Addictive substance: Nicotine
- Reinforcer
  - Releases neurotransmitters in brain
  - Produces pleasure
  - Gets to brain in about 11 seconds
- Withdrawal Syndrome
  - Levels begin to drop immediately
  - Negative feelings occur
Typical Smoking Pattern

- Usually in withdrawal upon waking
- First cigarette leads to quick peak
- Serum levels begin to drop immediately upon completion of cigarette
- Withdrawal occurs
- Next cigarette is smoked to relieve withdrawal
- Pattern is repeated throughout the day
Predicted Serum Concentration Chart

Predicted Serum Nicotine Concentration Over the Smoking Day

[HOURS SINCE WAKING]

[CIGS]

[Projected Nicotine Concentration (ng/ml)]

[Nicotine levels fluctuate throughout the day, peaking at certain times and declining as the day progresses.]

[Times and activities indicated: 9AM, 1PM, 5PM, 9PM, 1PM (SLEEP), 5AM, 9AM (WALKING, SUBJECT E.W.).]
Nicotine Absorption

- Readily absorbed from Peak concentration
  - Respiratory tract: 11 seconds
  - Nasally: 5-10 minutes
  - Orally: 10-15 minutes
  - Skin: 6-9 hours

Minimal stomach absorption due to acidity
Other Effects of Nicotine

- Effects depend of dose
- Stimulant/tranquilizer
- Increases respirations
- Increases GI tone and motor activity
- Some evidence to suggest it facilitates memory and decreases aggression
- Slight shift in metabolism
What Nicotine Does Not Do!

• Get rid of stress!
  – Smoking causes stress!
  – Stress relief from smoking is behavioral

• Turn the body into a fat burning machine!
  – The average weight again as a direct result of quitting is only five to seven pounds
  – Weight gain is due to behavior changes
Smoking and Medication Use

- Oral Birth Control
- Hydrocarbons in smoke induce CYP1A2
  - Theophylline
  - Clozapine
  - Haloperidol
  - Tricyclic Antidepressants
  - Caffeine
Withdrawal

- Irritability
- Anxiousness
- Impatience
- Restlessness
- Depression
- Sleep Disturbances
- Cravings
- Increased Appetite
Smoking Cessation Medications

• Significantly reduces or eliminates all these symptoms

• Delays/Decreases: Increase in appetite, weight gain
Nicotine Toxicity

- Perspiration
- Dizziness
- Nausea/vomiting/diarrhea
- Difference: Withdrawal/toxicity
  - Toxicity is physical
  - Withdrawal is emotional
- Very rare even with concomitant use of NRT and smoking
Pharmacotherapy: Why?

- Prevents withdrawal
- Eliminates the reinforcing effect of nicotine when administered through smoking
- Gives the quitter the time to comfortably break habit and psychological dependence
Pharmacotherapy: Limitations

- Not “magic pills”
- They do not “cure” someone of smoking
- Best when combined with behavioral counseling:
  - In office if you are so inclined or
  - Refer to
    - Local programs
    - Medication sponsored program
    - PA Free Quit Line: 1 877 724-1090
Clinical Practice Guidelines

- “..tobacco dependence warrants medical treatment just as do other drug dependence disorders and other chronic diseases.”
- “…using pharmacotherapies found to be effective in this guideline, clinicians can double or triple their patient’s chance of abstinence.”
Currently Available Products

• Over-the-counter
  – Patch
  – Gum
  – Lozenge

• Prescription
  – Oral Inhaler
  – Nasal Inhaler
  – Zyban
  – Chantix
Patch: Heavy Smokers

• Nicoderm CQ 24/16 Hours
  – 10/day or more
  – 21mg x 6wks, 14mg x 2wks, 7mg x 2wks

• Private Label
  – 10/ day or more
  – 21mg x 4wks, 14mg x 2wks, 7mg x 2wks
Light Smokers

• Nicoderm
  – Less than 10/day
  – 14mg x 6wks, 7mg x 2wks

• Private Label
  – Less than 10/day
  – 14mg x 4wks, 7mg x 2wks
Very Light Smokers

• 5 cigarettes a day or less
  – NRT is generally not recommended
  – If quitter insists use only the lowest patch strength for a few weeks
  – Suggest gum, lozenge or inhaler
Patch Patient Counseling

- Apply promptly
- Apply a new patch every day to a different, dry, clean, hairless place
- Rotate sites over a seven day period
- Do not leave on for more than 24 hours
- Do not use if using tobacco (4 hour bolus left in skin when removed)
Patch Side Effects

• Vivid Dreams

• Localized Skin Reactions (rash, pruritis)
  – Up to 50% of patients have mild form
  – Incidence higher with 24 hour products
  – Less than 5% discontinue therapy
Nicotine Gum

- Nicorette (Original, Fresh Mint, Fruit Chill)
- Generic
- Both come in
  - 2mg (< 25 cigarettes a day)
  - 4mg (>25 cigarettes a day)
Dosing Gum

• Schedule the same for 2mg and 4mg
• Weeks 1-6
  – 1 piece every one to two hours
• Weeks 7-9
  – 1 piece every 2-4 hours
• Weeks 10-12
  – 1 piece every 4-8 hours
Gum Patient Counseling

- Must use on a regular, consistent basis throughout the day (at least nine pieces)
- Use for a full three months with a fixed tapering schedule
- Do not use more than 24 pieces a day
- Avoid eating or drinking with gum in mouth
- Additional pieces can be used PRN to deal with specific urges
Proper Gum Technique

- **Do Not Chew!!**
- Proper technique
  - Activate slowly until “peppery taste” emerges
  - Then park between cheek and gum
  - When taste disappears, move and repeat
  - One piece is usually good for 30 minutes
Gum Precautions

• Incorrect use may lead to:
  – Mouth soreness
  – Dyspepsia, hiccups, etc.
  – Jaw Ache

• May stick to dentures and braces

• Do not use with patients who have TMJ
Lozenge

- Brand: Commit
- Generic
- Sublingual administration
- Quick Acting
- Mint Flavor
- 2mg—first cigarette > 30 min. from waking
- 4mg—first cigarette < 30 min. from waking
Lozenge Dosing

- **Weeks 1-6:**
  - One piece every one to two hours
- **Weeks 7-9:**
  - One piece every two to four hours
- **Weeks 10-12:**
  - One piece every four to eight hours
Oral Inhaler

- Prescription
- Mouthpiece with nicotine cartridge
- Cartridge = 10mg nicotine
- Mimics the oral aspect of smoking
- Use 6-16 cartridges/day puffing as needed
- Can be used for up to six months
Nasal Inhaler

- Prescription
- One metered spray contains .5mg nicotine
- One to two sprays in each nostril per hour, initially—increase as needed
- No more than 5 doses/hr. or 40 doses/day
- Use for eight weeks then taper for 4-6 wks.
Precautions for NRT Use

• MI within two weeks
• Unstable angina
• Dysrhythmia
• Uncontrolled hypertension
• Pregnancy

Review on case-by-case basis. Risk of continued smoking far outweighs minimal risk of short term NRT use.
Safety of NRT: Cardiac Patients

- In patients > 2 wks post MI, no greater risk of death for those who use patch vs. placebo
- Inaccurate media reports caused confusion
- American College of Cardiology recommends that all smokers receive NRT even if CAD present

*Joseph Am. NEJM 1996 335:1792-8
JACC 29:1422-31*
Safety of NRT Cont.

- Smokers with CAD and myocardial ischemia underwent stress tests while smoking and on nicotine patch
  - Ischemia improved while on patch
  - No deaths even in patients who continued to smoke

Mahmalian JJ. JACC 1997 30: 125-30
Pregnancy and NRT Use

- Behavioral interventions: first line treatment
- If NRT chosen:
  - Monitor blood nicotine levels
  - Use intermittent therapy rather than continuous
    (Gum or lozenge versus patch)
- Zyban may be alternative—Category B
Pregnancy and NRT Use Cont.

• Recent study shows that patch can be used safely during pregnancy

• Minimal risk of using patch outweighs substantial risk of continued smoking.

Schroeder DR, J Maternal Fetal Neonatal Med, 2002 Feb. 11 (2) 100-7
Pregnancy Recommendation

• Clinical Practice Guideline recommends:
  “Pharmacotherapy should be considered when a pregnant woman is otherwise unable to quit and when the likelihood of quitting, with its potential benefits, outweighs the risks of pharmacotherapy or potential continued smoking.”
Efficacy of NRT

• Using NRT produces double or triple the long term quit rates over placebo
• Caution: Not a magic bullet
  – Not a “cure” for smoking
  – Part of a comprehensive treatment program
  – Most effective when combined with a behavior modification program
Zyban (Bupropion)

- Repackaging of Wellbutrin
- May increase dopamine
- **Begin one week prior to quitting**
- 150 mg Q/Day x 3, then 150mg BID
- 7-10 weeks of therapy: no tapering
Zyban (cont.)

- Drug interactions:
  - Tricyclic antidepressants (lowers seizure threshold)
  - MAOI (hypertensive crisis)
- Absolute contraindication: Seizure disorder or head trauma
- Relative contraindications: PTSD, Bulimia and Anorexia
Zyban (cont.)

- Side effects: Dry mouth, insomnia, agitation
  - If occur with initial use of SR Q/day then try 75mg immediate release
  - Can be minimized by:
    - Reducing SR dosage to Q/day
    - Give entire 300mg in morning
    - Move second dose to as early in day as possible
  - SR Q/day vs. BID give almost identical 6mth quits
  Hurt RD, NEJM 1997, 337 1195-202
Chantix (Varenicline)

- Approved 5/6
- Activates nicotine receptors allowing brain to think nicotine has arrived
- Reduces craving and withdrawal
- Also reduces effect of nicotine if someone does smoke
- Not approved for use with anyone under 18
Chantix Dosing

- Begin Therapy one week prior to quitting
- 0.5mg/day for 3 days
- 0.5mg B.I.D. for 3 days
- 1mg B.I.D. for remainder of therapy
- Recommended for 12 weeks
- Additional 12 wks if needed to stop relapse
Additional Information

- Take after eating and with glass of water
- Caution in use with renal insufficiency and during hemodialysis
- Adverse effects: nausea, vomiting, gas, dreams
- Pregnancy Category C
Combination Therapies

- Clinical trials show using Patch and Zyban increases quit rates over using either alone
  - Probably best for heavy smokers: > 2 packs/day
- Can use patch or Zyban as “base” therapy
- Gum, lozenge or inhalers can then be used PRN for specific trigger situations
Second-Line Pharmacotherapies

• Nortriptyline: Not FDA approved but some clinical evidence of efficacy
  – Try Nortriptyline if cannot tolerate Zyban
  – Begin at 10mg/TID and gradually increase to 25mg/TID as tolerated
  – Initiate 10-28 days prior to quit date to allow for therapeutic blood levels

• Clonidine: Not FDA approved/weak evidence
“All patients attempting to quit should be encouraged to use effective pharmacotherapies for smoking cessation except in the presence of special circumstances”
Other Products

- No clinical evidence of efficacy:
  - Other Antidepressants
  - Nicotine Lollypops
  - Nicotine Lip Balm
  - Nicotine Water
  - Herbal Remedies
Other Treatment Modalities

- Hypnosis
- Acupuncture
- Ear Clips
- “Fake” cigarettes
- Tapering
- Lasers
- Aversive Techniques
What Else Can I Do?

• Advise all patient to quit
• Assist in the quit
  – Recommend appropriate pharmacotherapy
  – Refer to counseling
    • In office
    • Local groups/programs
    • PA Free Quit line: 1 877-724-1090
• Arrange follow up
Highest efficacy: Combining a smoking cessation medication with behavioral counseling
Treating Smokeless Tobacco Users

- 8 dips is equivalent to one pack of cigarettes for medication dosing purposes
- Patch is preferable: breaks the oral connection
- Combination therapies also beneficial
- Behavioral approach is similar to smokers
Final Reminders

- There is no one “right” way to quit smoking
- Treatment should be ongoing not acute
- Tailor the treatment to the individual
- A little bit of information is better than no information at all
Other AHEC Training Programs

- Practical Office Interventions for Physicians: Counseling Smokers to Quit
  - Reviews brief and moderate intensity interventions
- Reimbursement for Smoking Cessation
- Smoking 101