SMOKING CESSATION

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- Cigarette smoking is the leading preventable cause of mortality.
- The 3 major causes of smoking-related mortality are atherosclerotic CVD, lung cancer, and COPD
- Screening all patients for tobacco use and providing smokers with behavioral counseling and pharmacotherapy to stop smoking are among the most valuable preventive services that can be offered in health care.

BENEFITS OF SMOKING CESSATION

- Improvement in all-cause mortality
  - Stopping smoking at younger ages (**before age 40**) is associated with a larger decline in premature mortality than stopping at a later age
- Substantial reduction in the risk of CVD (MI, Sudden cardiac death, stroke, and PAD)
  - Nicotine can lead to several harmful effects on the CVS:
    - Coronary vasoconstriction
    - Increased hypercoagulability
    - Dyslipidemia
    - Endothelial dysfunction
- Reduction in the risk of developing malignancies

BENEFITS OF SMOKING CESSATION, CONT'D

- Reduction in the risk of developing COPD, pulmonary fibrosis and improvement in the symptoms of asthmatic patients
- Reduction in the risk of several types of infections e.g. influenza, common cold, pneumococcal pneumonia
- Reduction in the risk of developing DM II
  - Nicotine impairs glucose sensitivity
- Improved fetal and maternal outcomes
  - Smoking is associated with an increased risk of subfertility in both men and women, premature menopause and erectile dysfunction.
  - Maternal smoking is associated with spontaneous abortion, ectopic pregnancy and lower birth weight

BENEFITS OF SMOKING CESSATION, CONT'D

- Reduction in the risk of developing PUD and acceleration in the rate of healing in established disease
- Decline in the risk of developing periodontal disease
- Lowering the rate of developing postoperative complications (delayed wound healing and pulmonary complications)
  - Longer periods of smoking cessation prior to surgery are associated with lower rates of postoperative complications
- Reversal in the loss of BMD and reduction in the risk of hip fracture

Recommendation Summary

Population	Recommendation	Grade
Nonpregnant adults	The USPSTF recommends that clinicians ask all adults about tobacco use, advise them to stop using tobacco, and provide behavioral interventions and US Food and Drug Administration (FDA)--approved pharmacotherapy for cessation to nonpregnant adults who use tobacco.	A
Pregnant persons	The USPSTF recommends that clinicians ask all pregnant persons about tobacco use, advise them to stop using tobacco, and provide behavioral interventions for cessation to pregnant persons who use tobacco.	A
Pregnant persons	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of pharmacotherapy interventions for tobacco cessation in pregnant persons.	I
All adults	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of electronic cigarettes (e-cigarettes) for tobacco cessation in adults, including pregnant persons. The USPSTF recommends that clinicians direct patients who use tobacco to other tobacco cessation interventions with proven effectiveness and established safety. See the Practice Considerations section for more information on recommended behavioral interventions and pharmacotherapy and for suggestions for practice regarding the I statements.	I

APPROACHES FOR SMOKING CESSATION

- The 5 "A's" approach
- Variations of the 5 "A's" approach
- The 5 "R's" model

THE 5 "A'S" APPROACH

- **A**sk about tobacco use
- **A**dvise quitting
- **A**ssess readiness to quit
- **A**ssist smokers ready to quit
- **A**rrange follow-up

THE PROACTIVE APPROACH

- The "proactive offer of treatment" approach is a variation to the 5 A's approach.
- This approach replaces the step of assessing readiness to quit with a proactive offer of treatment.
  - Instead of first asking if the patient is ready to quit, the clinician proactively offers treatment
- With this method, the clinician approaches tobacco use like other chronic diseases (e.g, DM or HTN)
  - In chronic diseases embarking on a treatment plan is generally presented as an expectation, rather than as an option.

ASK ABOUT TOBACCO USE AND EXPOSURE

- Ask a patient if he or she ever smokes cigarettes or other tobacco products (pipes, cigars, water pipes..) or electronic cigarettes.
- Assess the frequency of use, products used, degree of nicotine dependence, history of quit attempts (including methods used and their effectiveness)
- Estimate the degree of nicotine dependence (Fagerstrom test for cigarette smoking, Lebanon waterpipe dependence scale)
- More dependent smokers started smoking early in life, smoke more cigarettes daily , and smoke within the first 30 minutes of awakening

Modified Fagerström Test for Nicotine Dependence

1. How soon after you wake up do you smoke your first cigarette?

   Within 5 minutes (3 points)

   5 to 30 minutes (2 points)

   31 to 60 minutes (1 point)

   After 60 minutes (0 points)

2. Do you find it difficult not to smoke in places where you shouldn't, such as in church or school, in a movie, at the library, on a bus, in court or in a hospital?

   Yes (1 point)

   No (0 points)

3. Which cigarette would you most hate to give up; which cigarette do you treasure the most?

   The first one in the morning (1 point)

   Any other one (0 points)

4. How many cigarettes do you smoke each day?

   10 or fewer (0 points)

   11 to 20 (1 point)

   21 to 30 (2 points)

   31 or more (3 points)

5. Do you smoke more during the first few hours after waking up than during the rest of the day?

   Yes (1 point)

   No (0 points)

6. Do you still smoke if you are so sick that you are in bed most of the day, or if you have a cold or the flu and have trouble breathing?

   Yes (1 point)

   No (0 points)

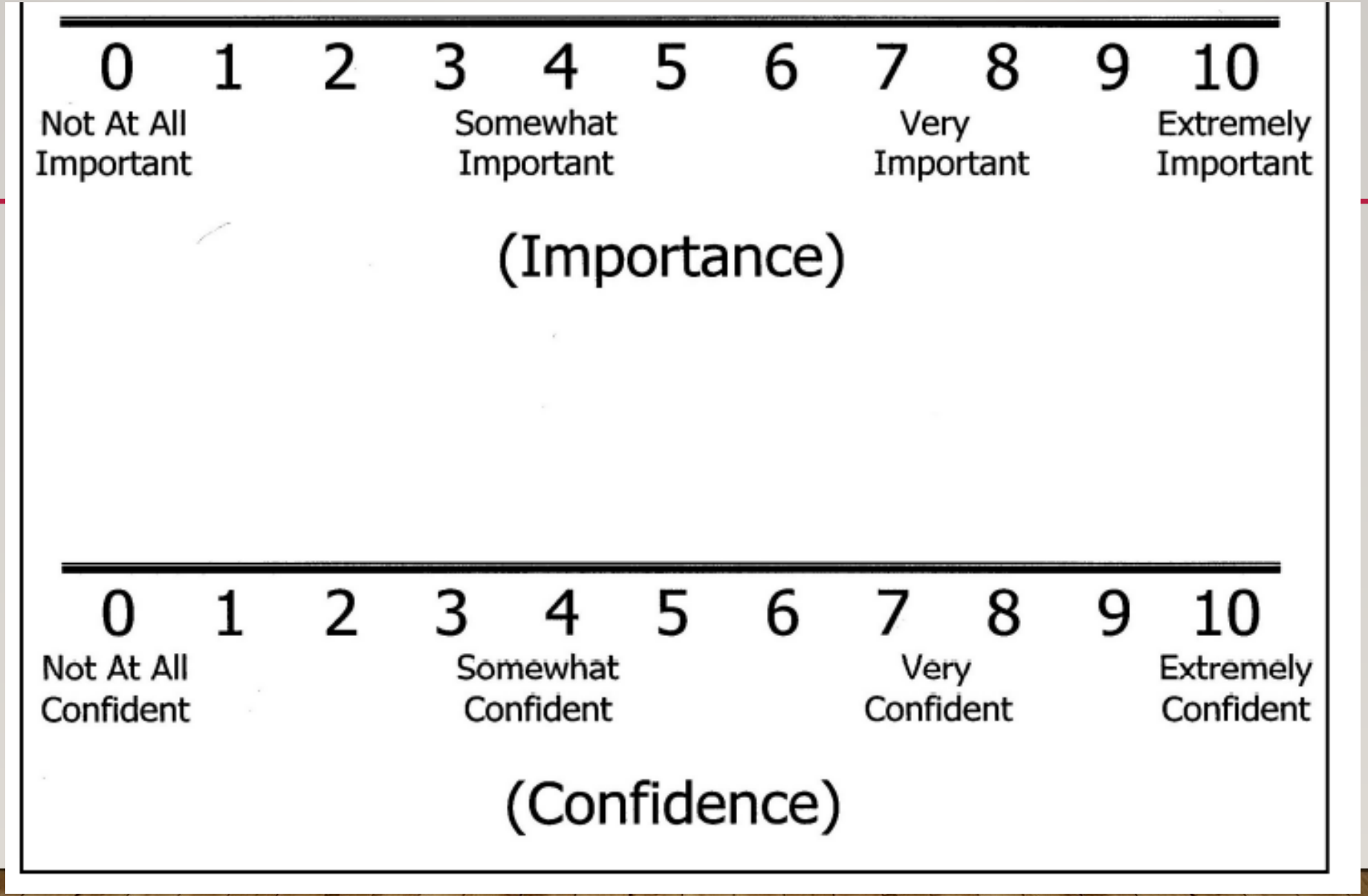
Scoring: 7 to 10 points = highly dependent; 4 to 6 points = moderately dependent; less than 4 points = minimally dependent.

ADVISE SMOKING CESSATION

- Offering brief advice to quit smoking (<5 minutes) at each encounter can increase smoking abstinence rates
- Even if they are not ready to quit, smokers who are asked about their tobacco use or are advised to quit smoking report being more satisfied with their care than patients who do not receive such advice

ASSESS READINESS TO QUIT

- Assess the patient's willingness to make a quit attempt.
- Assess the level of motivation and importance of quitting for that patient
- Assess his confidence in quitting success
- This helps to differentiate between those ready to quit for whom assistance to quit is indicated, and those not yet ready to quit for whom motivation to quit is needed.
- Another alternative to assessing readiness to quit is to use the proactive approach, advise quitting and offer treatment.


0 1 2 3 4 5 6 7 8 9 10
Not At All Important
Somewhat Important
Very Important
Extremely Important
(Importance)
0 1 2 3 4 5 6 7 8 9 10
Not At All Confident
Somewhat Confident
Very Confident
Extremely Confident
(Confidence)

ASSIST SMOKERS READY TO QUIT

- Set a quit date within the following 2-4 weeks
  - Abruptly quitting on the quit date appears to be more effective than gradual reduction prior to the quit date.
- Address barriers to quit
- Treatments
  - Behavioral Counseling
  - Pharmacotherapies

BARRIERS TO QUIT

- Nicotine withdrawal symptoms
- Trigger events
  - Smokers become conditioned to associate the pleasurable effects of tobacco use with environmental triggers such as:
    - Morning coffee
    - An alcoholic drink
    - Th end of a meal
    - Being in stressful situations
    - Being around other smokers
- The possibilities of weight gain

NICOTINE WITHDRAWAL SYNDROME

- Symptoms peak in the 1st 3 days of smoking cessation and subside over the next 3-4 weeks, but smokers' cravings for cigarettes may persist for months to years.
- They include:
  - Increased appetite and weight gain
  - Changes in mood (dysphoria or depression)
  - Insomnia
  - Irritability, anxiety, difficulty concentrating, and restlessness.
- Can be alleviated by any of the first-line smoking cessation medications & behavioral approaches

WEIGHT GAIN

- Weight gain of 1-2 kg in the 1st 2 weeks is usually followed by an additional 2-3 kg over the next 4-5 months.
- The average total weight gain is 4-5 kg but may be much greater.
- Limiting weight gain can be achieved by:
  - Behavioral counseling including dietary or physical activity interventions
  - Users of Bupropion have temporarily blunted weight gain

TREATMENTS

- A combination of behavioral and pharmacologic treatments is superior to either therapy alone.
- Behavioral counselling can be in the form of:
  - Brief clinician counseling in the office
  - Formal individual or group counseling or telephonic counseling.
  - Web-based interventions and self-help websites
  - Text messaging, phone apps
- Behavioral therapy includes
  - Education about withdrawal symptoms
  - Identification of triggers
  - Problem solving and coping skills
  - Stress management and relaxation strategies
  - Supportive therapy and positive encouragement

COPING STRATEGIES

- Exercise : Use exercise as an outlet and a way to address post-smoking cessation weight gain.
- No-smoking zones: Enact no-smoking policies for home and car to minimize time spent with smokers.
- Behavioral distraction: Engage in repetitive or simple activities (eg, doodling, knitting).
- Cognitive distraction : Think about what needs to be done (eg, for work, errands). Make a to-do list of priorities.
- Oral strategies : Chew gum, drink a glass of water or have a small, healthy snack.
- Positive self-talk and visualization : Think "this will get easier," or visualize yourself not smoking.
- Benefits of quitting : Remember the health and economic benefits of quitting.

STAGES OF BEHAVIOR CHANGE

- **Precontemplation**: No intention to take action within the next 6 months
- **Contemplation**: Considering change within the next 6 months
- **Preparation**: Planning to take action within the next month
- **Action**: Actively changing (first 6 months of new behavior)
- **Maintenance**: More than 6 months since behavior change

PHARMACOTHERAPY

- These treatments aim to reduce symptoms of nicotine withdrawal
- First-line pharmacotherapies are:
  - Combination nicotine replacement therapy (NRT) consisting of :
    - Long-acting NRT and
    - Short-acting NRT
  - Varenicline
  - Bupropion.
- Pharmacotherapies for smoking cessation are recommended for 2-3 months.

PHARMACOTHERAPY

- Provide follow-up 1-2 weeks after initiation of any pharmacotherapy
- Further follow-up should be scheduled at 3 months and 1 year, and more frequently if necessary.
- Second-line agents include: Nortriptyline and Cytisine
- SSRIs and anxiolytic drugs generally have not been shown to be effective for smoking cessation
- Electronic cigarettes (e-cigarettes) are nicotine delivery devices that use a battery to aerosolize nicotine. Because tobacco is not burned, these devices are likely to be safer than continuing to smoke conventional tobacco cigarettes, but their safety is uncertain because they are newer products.

NRT

- The goal of their use is to relieve nicotine withdrawal symptoms by providing nicotine without the use of tobacco, while the smoker breaks the behavior of cigarette smoking.
- Single-agent NRT is less effective than combining the long-acting patch with a short-acting form
- Nicotine patches are the long-acting NRT
- Short-acting NRT can be in the form of lozenge, gum, inhaler, or nasal spray

NICOTINE TRANSDERMAL PATCH

- Dosing:
  - >10 cigarettes/day **and** weight >45 kg : Start with 21 mg/day for 6 weeks, followed by 14 mg/day for 2 weeks, and finish with 7 mg/day for 2 weeks.
  - ≤10 cigarettes/day **or** weight < 45 kg : Start with 14 mg/day for 6 weeks, followed by 7 mg/day for 2 weeks.
- Apply one patch each morning to any non-hairy skin site
- Remove and replace the patch with a new one at bedtime (replace it the next morning if result in insomnia and vivid dreams)

NICOTINE GUM

- Released nicotine is absorbed through the oral mucosa, resulting in peak blood nicotine levels 20 minutes after starting to chew.
- Proper chewing of gum is important for optimal results ("Chew and park“) then discard the gum after 30 minutes.
- Dosing:
  - ≥ 25 cigarettes/day : 4 mg dose of gum
  - < 25 cigarettes/day : 2 mg dose of gum
- In the first 6 weeks chew at least one piece of gum every 1-2 hours while awake and also whenever there is an urge to smoke (up to 15 pieces of gum per day).
- Gradually reduce use over a second 6 weeks,(one gum q 2-4 hr for 3 weeks, then one q4-8 hr for 3 weeks) for a total duration of 3 months.
- Avoid acidic beverages (eg, coffee, carbonated drinks) before and during gum use, as acidic beverages lower oral pH, which reduces nicotine absorption.

NICOTINE LOZENGE

- Lozenges are easier to use correctly than nicotine gum and are also available in different flavors.
- Dosing:
  - Smokers who smoke within 30 minutes of awakening: 4 mg dose recommended
  - Smokers who wait more than 30 minutes after awakening to smoke: 2 mg dose recommended
- Use up to one lozenge every 1-2 hours for 6 weeks. The maximum dose is 15 lozenges per day.
- Gradually reduce number of lozenges used per day over a second 6 weeks.
- Place lozenge in the mouth and allow it to dissolve for 30 minutes. The lozenge does not need to be chewed.
- Unlike the gum, the lozenge can be used in smokers with TMJ disease, poor dentition or dentures.
- Both gums and lozenges can lead to mouth irritation or ulcers, in addition to nicotine-related side effects.

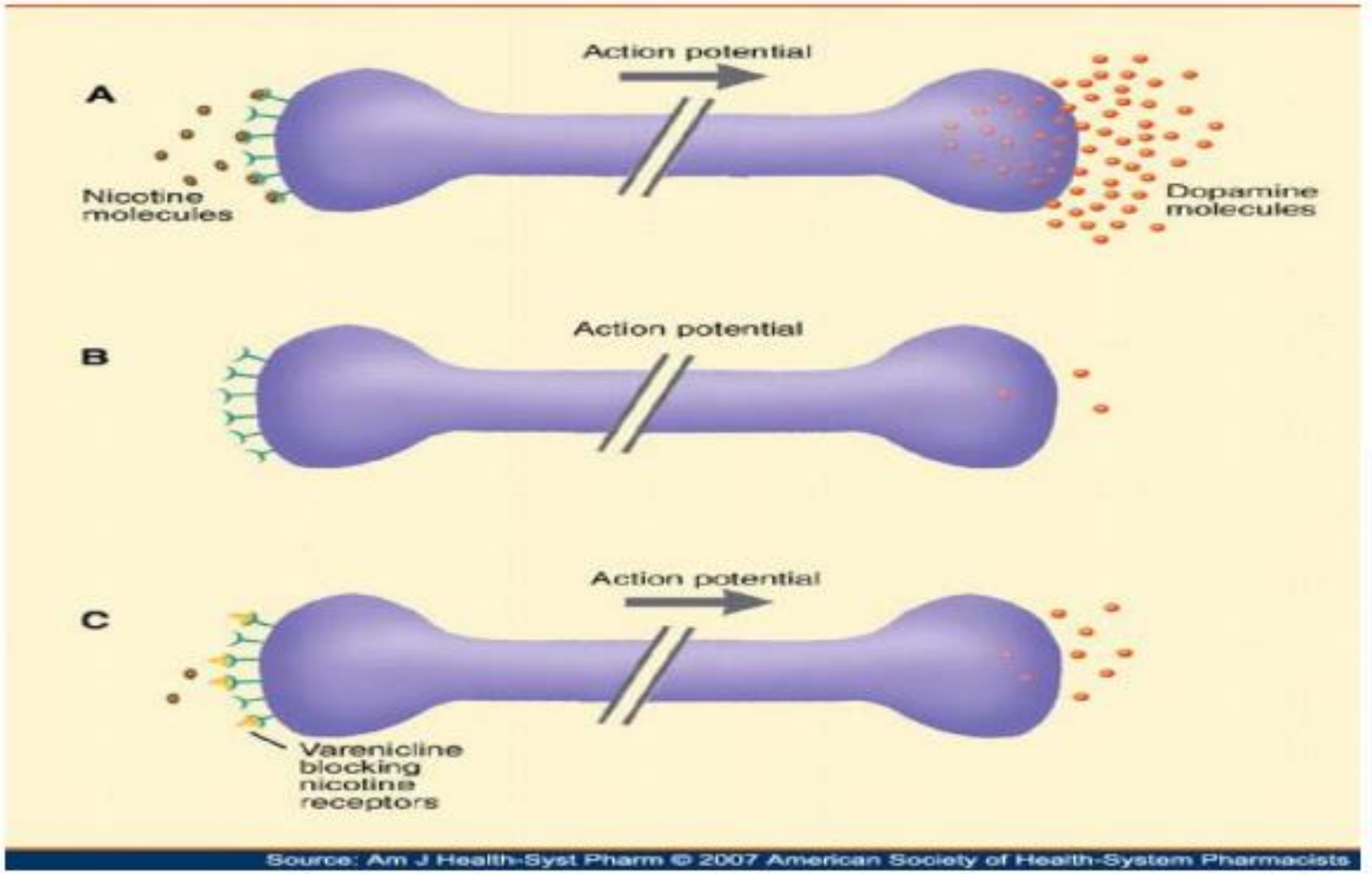
NRT SAFETY

- Side effects: GI symptoms (nausea, vomiting, abdominal pain, diarrhea) and headache.
- Nicotine dependence rarely occurs
- Smokers may worry that nicotine causes cancer, which it does not
- NRT is safe to use in patients with known **stable** CVD
- Use with caution among particular cardiovascular patient groups:
  - Those in the immediate (within 2 weeks) post-MI period
  - Those with serious arrhythmias
  - Those with unstable angina pectoris

VARENICLINE (CHAMPIX)

- It is a selective alpha4-beta2 nicotinic receptor **partial agonist** that reduces cravings and withdrawal symptoms while blocking the binding of smoked nicotine.
- The most common S/E are **nausea** and **sleep disorders** (eg, insomnia, abnormal dreams).
- There were early concerns about **neuropsychiatric** and **cardiovascular** side effects of varenicline, but subsequent studies have not supported these concerns, and varenicline is generally considered safe.
- Safe for use in patients with COPD
- Smokers are instructed to quit smoking 1-4 weeks after starting varenicline
- Dosing: 0.5 mg daily for 3 days, then 0.5 mg twice daily for 4 days, and then 1 mg twice daily for the remainder of a 12-week course.

Varenicline: Mechanism of Action



BUPROPION (ZYBAN)

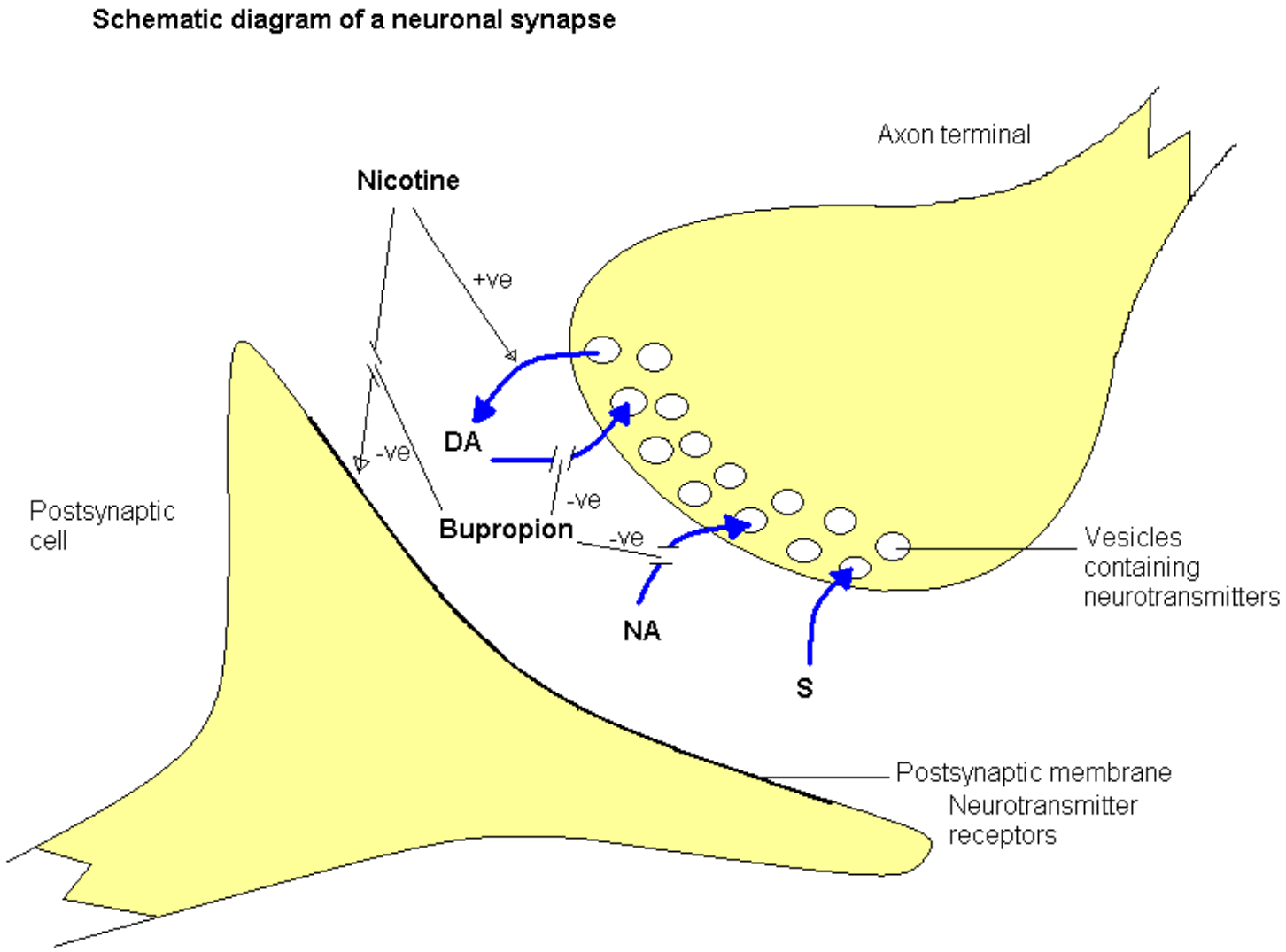
- Acts by inhibiting reuptake of norepinephrine and dopamine in the CNS.

- Safe to be used in patients with stable CVD or COPD.
- Bupropion sustained-release is started 1 week before the quit date
- Dose: 150 mg/day for 3 days, then 150 mg twice a day for the 12- week treatment period.
- It can be combined with a NRT for increased effectiveness.
- May be beneficial for patients with a history of depression.

BUPROPION, CONT'D

- S/E include: insomnia, agitation, dry mouth, and headache.
- Contraindicated in :
  - CNS disorders (seizures), and in situations that increase seizure risk (e.g. abrupt alcohol withdrawal, bulimia).
  - Severe hepatic cirrhosisa
- Has multiple drug-drug interactions because it's metabolized in the liver
- FDA pregnancy Class C agent

Bupropion


Schematic diagram of a neuronal synapse
Axon terminal
Nicotine
+ve
DA
-ve
-ve
Bupropion
-ve
NA
S
Postsynaptic cell
Vesicles containing neurotransmitters
Postsynaptic membrane
Neurotransmitter receptors

ELECTRONIC CIGARETTES

- For adult smokers, the evidence that e-cigarettes are effective smoking cessation aids is growing, but the risks remain uncertain.
- E-cigarettes have the potential to benefit adult smokers who are not pregnant if used as a complete substitute for regular cigarettes and other smoked tobacco products.
- E-cigarettes are not safe for youth, young adults, pregnant women, as well as adults who do not currently use tobacco products.

E-CIGARETTES-ADVERSE HEALTH EFFECTS

- carcinogenic potential
  - propylene glycol→propylene oxide
  - Glycerol→acrolein

  ] Formaldehyde, Acetaldehyde

- Severe acute lung illness
  - E-cigarette, or vaping, product use associated lung injury [EVALI]
  - Idiopathic acute eosinophilic pneumonia
- May be an association with cough and asthma symptoms, particularly among adolescents

E-CIGARETTES - HEALTH CONCERNS

- The potential to
  - Increase youth initiation of tobacco products
  - Renormalize tobacco use in places where cigarette smoking is not acceptable
  - Lead to nicotine dependence.

- Accidental nicotine poisoning in children has been reported.
- The health effects of secondhand vapor exposure are unknown
- E-cigarette devices have been reported to cause burns, explosive injuries, and chemical injuries

ARRANGE FOLLOW-UP

- Follow-up should be scheduled within 1-2 weeks of the quit date then at 3 months and 1 year for those with successful quitting
- The aims of this visit are to
  - Provide reinforcement
  - Monitor response to smoking cessation therapy,
  - Optimize treatment with first-line therapies if necessary,
  - Monitor for S/E of pharmacotherapy.
  - Address any problems associated with smoking cessation efforts
- If the smoker does not succeed in quitting on the quit date the clinician can help by:
  - Identifying any problems & exploring solutions for the next quit attempt
  - Adjusting pharmacotherapy and intensifying behavioral interventions

RELAPSE

- Following relapse, smokers should be encouraged to make another attempt to stop smoking, with enhanced behavioral counseling, pharmacotherapy, or both.
- Patients should be reminded that most smokers require multiple attempts at smoking cessation before permanently quitting.
- If a previous pharmacotherapy for smoking cessation was helpful temporarily, use the same therapy that worked previously with the addition of another medication to enhance efficacy.
- If the initial pharmacotherapy was unhelpful, select a different pharmacotherapy.

ASSISTING PATIENTS **NOT** READY TO QUIT

- Most smokers have a general desire to stop smoking, but for a variety of reasons may not be ready to take specific actions to quit.
- Motivational interviewing techniques are useful to explore a patient's feelings, beliefs, ideas, and values regarding tobacco use. An example is the "5 R's" model
- Smokers who are not interested in quitting should be advised to protect other people from exposure to secondhand smoke and urged to adopt a strict smoke-free policy for their homes, workplaces, and cars, especially if children are present.

THE 5 "R'S" MODEL

- **Relevance** : Use motivational information that is personally relevant to a patient's circumstances, such as their disease status or risk.
- **Risks** : Ask the patient to identify potential negative consequences associated with tobacco use. Stress the risks most applicable to the patient, including:
  - Acute health risks
  - Long-term risks
  - Environmental risks
- **Rewards** : Encourage the patient to identify potential benefits of quitting smoking
- **Roadblocks** : Invite the patient to identify barriers or impediments to quitting and suggest treatments (problem solving counseling, medication)
- **Repetition** : Repeat the motivational intervention every time an unmotivated patient visits the clinic setting.

REFERENCES

- Overview of smoking cessation management in adults, UpToDate 2018
- Pharmacotherapy for smoking cessation in adults, UpToDate 2018
- Benefits and risks of smoking cessation, UpToDate 2018
- Behavioral approaches to smoking cessation, UpToDate 2018
- Vaping and e-cigarettes, UpToDate 2020