Smoking Cessation Show Notes

Options for Pharmacotherapy

Introduction

Smoking is the largest preventable cause of morbidity and mortality in our patients, causing over 6 million deaths per year (Reitsma et al 2017). Getting patients to quit can often be one of the most effective things we can do for them. To optimize a patient's chances of sustained smoking cessation, they should receive a combination of counseling (using methods such as the 5-As) and pharmacotherapy. Patients are more likely to have lasting abstinence when they quit smoking abruptly compared to a gradual taper (Lindson-Hawley et al 2016). Options for pharmacotherapy are discussed below.

Nicotine Replacement Therapy

Nicotine replacement therapy (NRT) is one of the more commonly used options for pharmacotherapy. There are 5 different forms of nicotine replacement available in the US: patches, gum, lozenges, inhalers, and a nasal spray. NRT works by preventing the patient from withdrawing from nicotine, and slowly tapering them off of it. NRT should be given as a combination of long-acting (patch) and short-acting NRT, as this increases long-term cessation by 25% compared to single NRT. (Lindson et al 2019)

Patches: Patches come in 7, 14, and 21 mg doses. Patches are the only long-acting form of NRT. They should be changed daily, and moved between sites to prevent skin irritation. Patients smoking over 10 cigarettes (1/2 a pack) daily should be started on the 21 mg patch, and those smoking less than that should start on the 14 mg patch. Some experts suggest not using a patch and only using short acting NRT for those who smoke under 5 cigarettes per day. Patients should be continued on the initial dose for 6 weeks before decreasing the dose.

Gum: Nicotine gum comes in 2 mg and 4 mg doses. Those who smoke over 25 cigarettes per day or smoke within 30 minutes of waking up should use the 4 mg dose, and others should use the 2 mg dose. It can be used every 1-2 hours up to 24 pieces per day. It is absorbed through the oral/buccal mucosa, so patients should be counseled to chew it then "park" the gum against the buccal mucosa until the taste disappears and repeat for 30 minutes. If swallowed, this can cause GI irritation. The gum will stick to patient's dentures, and soda, coffee, and alcohol consumption can decrease absorption.

Lozenges: Lozenges also come in 2 mg and 4 mg doses, and come in a mini-lozenge form which is smaller and better tolerated by patients. It is dosed similarly to the gum, so those who smoke within 30 minutes of waking should use the 4 mg dose. It can be used every 1-2 hours up to 20 pieces per day. Patients should be advised to let it dissolve rather than chewing it like the gum.

Inhaler: The nicotine inhaler works by absorption through the oral mucosa rather than the lungs, so patients should be advised not to inhale and to keep the vapor in their mouth. They can repeat this every 1-2 hours. The inhaler mimics the behavioral and sensory aspects of smoking, and may work better for patients who are having trouble stopping the physical habits of smoking.

Nasal Spray: The nasal spray is also dosed every 1-2 hours, and it has the quickest absorption of all methods resulting in peak levels within 10 minutes. It can cause nasal irritation, rhinorrhea, and sneezing and overall has the most side effects of any form of NRT.

Varenicline

Varenicline works by acting as a partial agonist to alpha-4 beta-2 nicotinic receptors. It blocks new nicotine binding (taking away any reward from smoking) but releases some dopamine preventing full withdrawal. It is usually started 7 days prior to quitting at 0.5 mg QD for 3 days, then increased to 0.5 mg BID for 4 days, and then 1 mg BID on the day of quitting. If patients aren't able to set a firm quit date, it can be started earlier to help reduce cravings and reward sensation from smoking.

Side Effects: There was initially a black box warning for increased suicidal ideation and other neuropsychiatric effects based on aftermarket reporting. The EAGLES trial (Anthenelli et al 2016) was published in 2016 and looked at neuropsychiatric effects from varenicline, bupropion, and nicotine patches. In the 8144 participants, 4116 had stable psychiatric conditions. They found no significant difference in neuropsychiatric adverse events attributable to varenicline compared to other groups, so the black box warning was removed in later that year. Otherwise, varenicline can cause nausea and vivid dreams. If patients have significant issues with nausea, it can be titrated up over a longer duration. For patients having vivid dreams or insomnia, they should be advised to take their evening dose with dinner rather than at bedtime.

Efficacy: The aforementioned EAGLES trial (Anthenelli et al 2016) also compared efficacy among agents and found varenicline had the highest rates of continued abstinence at 12 weeks – 21.8% compared to about 16% with bupropion and nicotine patches, and 9.4% with placebo. An earlier meta-analysis (Cahill et al 2013) found varenicline tripled the odds of quitting relative to placebo. Varenicline has also been shown to have increased cessation rates at 12 weeks and 6 months when combined with NRT (Koegelenberg et al 2014).

Bupropion

Bupropion is another potential option which works via its inhibition of reuptake of norepinephrine and dopamine, as well as acting as a nicotinic receptor antagonist (Slemmer et al 2000). It is less effective than varenicline or combination NRT, and similar in efficacy to single NRT (Cahill et al 2013). One of the main benefits of bupropion is it's low cost relative to other therapies, and it can also blunt weight gain normally associated with smoking cessation (Parsons et al 2009).

Additionally, in patients with underlying mental health concerns, bupropion can be used to decrease pill burden. Bupropion lowers the seizure threshold, and also can cause insomnia, dry mouth, anxiety, and headaches. It should be started one week prior to quitting at 150 mg QD for 3 days, then increased to 150 mg BID thereafter.

Medication	Dosing	Administration
Nicotine patch	21 mg for ≥ 10 cigarettes/day 14 mg for < 10 cigarettes/day Start tapering after 6 weeks	Apply patch to a new site each morning. If patient develops insomnia or vivid dreams, remove at bedtime.
Nicotine gum	If pt smokes within 30 minutes of waking: 4 mg. Otherwise 2 mg.	Chew-and-park up to once an hour or 24 maximum/day.
Nicotine lozenge	If pt smokes within 30 minutes of waking: 4 mg. Otherwise 2 mg.	Dissolve in buccal mucosa, use every 1-2 hours up to 20/day.
Nicotine inhaler	10 mg cartridge	Puff into mouth every 1-2 hours, do not inhale
Nicotine nasal spray	1 spray in each nostril	Use every 1-2 hours
Varenicline	Days 1-3: 0.5 mg/day Days 4-7: 0.5 mg twice daily Day 8+: 1 mg twice daily	Start at least 1 week prior to quit date.
Bupropion	Days 1-3: 150 mg/day Days 4+: 150 mg twice daily	Start at least 1 week prior to quit date.

Smoking Cessation Pearls

1. The most effective form of pharmacotherapy for smoking cessation is a combination of varenicline and nicotine replacement therapy.
2. Nicotine replacement therapy should be given as a combination of a long-acting patch and a short-acting form.
3. Short-acting forms of nicotine are similar in efficacy and should be chosen based on patient's preference.
4. Despite a prior black box warning, varenicline is safe for use in patients with psychiatric comorbidities, and the most effective option as monotherapy.
5. Bupropion is an effective option for patients for whom cost is a concern, and can also help blunt weight gain associated with smoking cessation.

Credits

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Outline

- **00:00** – Intro/Case
- **01:00** – Nicotine Replacement Therapy
- **06:50** – Varenicline
- **11:05** – Bupropion
- **15:05** – Selection of Initial Therapy
- **20:15** – Conclusion

References/Links

Reitsma et al 2017 “Smoking prevalence and attributable disease burden in 195 countries and territories, 1990–2015: a systematic analysis from the Global Burden of Disease Study 2015”. The Lancet. 2017

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