Cannabinoids and Health

Module 16

Lecture 2: Should cannabis be viewed as “medicine”?

Should cannabis be viewed as ”medicine”?

- I hear comments frequently from other scientists and physicians that cannabis is **NOT** medicine

- Why do some people have a hard time seeing it as medicine?
  - It has not followed the typical drug development path
  - It has not been approved by the FDA
  - It has not been studied in numerous Phase III clinical trials
  - It is not produced by the pharmaceutical industry
  - In short, it does not meet our Western definition of “medicine”

Rubric for Western "Medicine" vs. Cannabis / CBD

- A single compound with a specific target and mechanism of action
- One size fits all formulation and form of administration preferable
- Monopoly for Big Pharma - company to pay the FDA costs to review
- Rigorous manufacturing quality control and focus on safety (very important for drugs!)

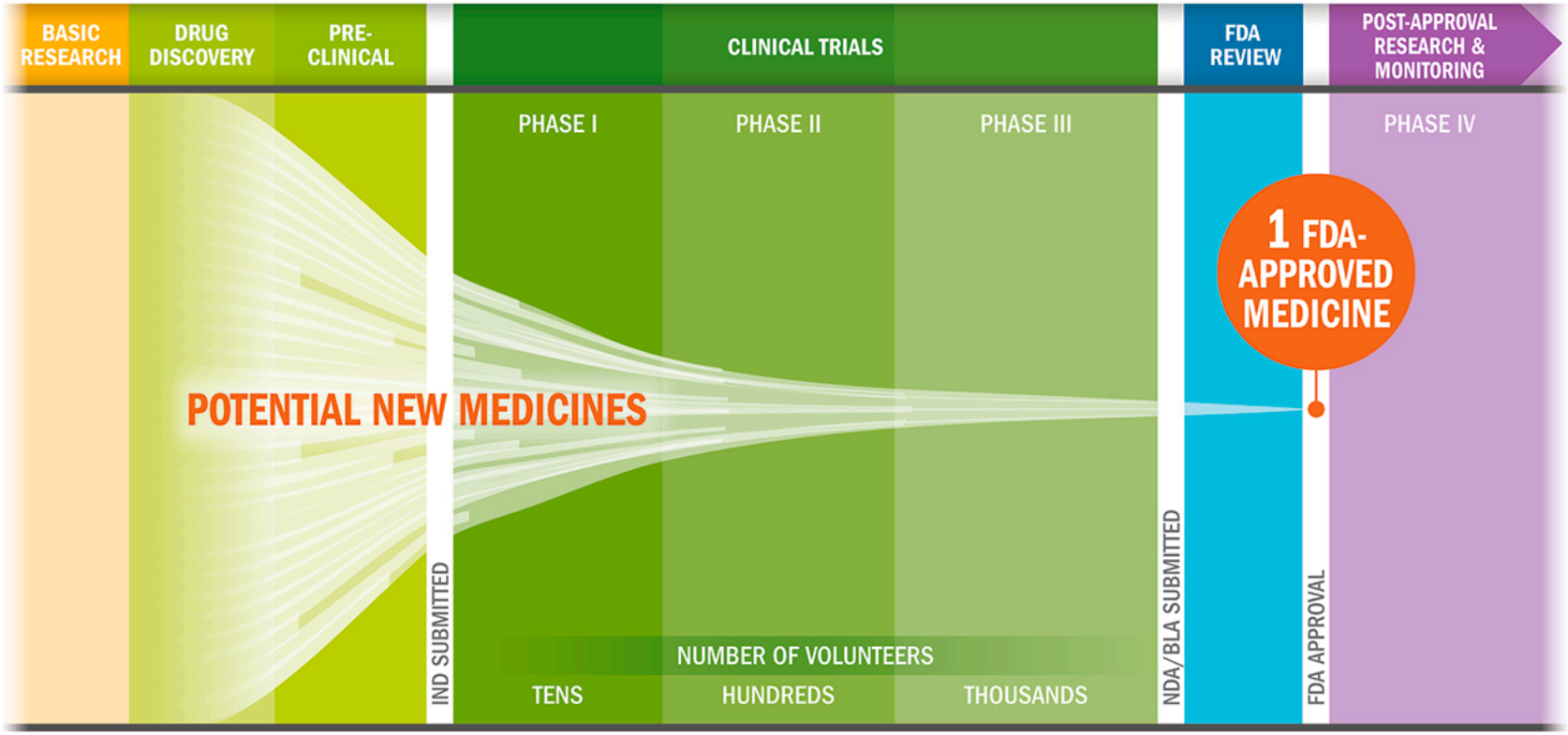
- Cannabis contains many active compounds
- Many of the compounds have multiple mechanisms of action (e.g., CBD)
- There are many different combinations, formulations, forms of administration and doses that people find to be effective
- You can grow it at home

What is the typical drug development pathway?

- A pharmaceutical company patents a compound, thereby ensuring that they will reap $ billions if the compound makes it through the approval process
- The company develops extensive data on the chemistry and manufacturing of the drug
- The company tests the compound in animals and for safety in humans
- The company does more testing in humans
- The company conducts clinical trials
- The company submits all of these data to the FDA

THE BIOPHARMACEUTICAL RESEARCH AND DEVELOPMENT PROCESS

From drug discovery through FDA approval, developing a new medicine takes at least 10 years on average and costs an average of $2.6 billion.* Less than 12% of the candidate medicines that make it into Phase I clinical trials will be approved by the FDA.



Key: IND: Investigational New Drug Application, NDA: New Drug Application, BLA: Biologics License Application

* The average R&D cost required to bring a new, FDA-approved medicine to patients is estimated to be $2.6 billion over the past decade (in 2013 dollars), including the cost of the many potential medicines that do not make it through to FDA approval.

Source: PhRMA adaptation based on Tufts Center for the Study of Drug Development (CSDD) Briefing: "Cost of Developing a New Drug," Nov. 2014. Tufts CSDD & School of Medicine., and US FDA Infographic, "Drug Approval Process," http://www.fda.gov/downloads/Drugs/ResourcesForYou/Consumers/UCM284393.pdf (accessed Jan. 20, 2015).

What is the typical drug development path?

- **Process takes about $2.5 to $5 billion and 5-10 years**

- The company then has a monopoly on the drug and makes many billions of dollars
  - Drug companies argue that the huge cost of research and development justifies the high price of medications
  - So we all are paying for drug development and for the profits made by the company

What is the typical drug development path?

- A decision by the FDA can mean $ millions/billions to a company – the FDA holds the cards
- 75% of FDA funding to review drugs comes from the pharmaceutical industry
- FDA charges ”User Fee” to review a new drug application – about $2.5 million in 2018
- Companies make decisions about whether to pursue drug development for a specific disorder mostly on financial considerations (i.e., how much money can we make)
  - Depends on compound
  - Depends on medical disorder/indication/patient population
- Companies also make decisions about whether to allow scientists to study their drugs based on financial risks

Epidiolex Example

- GW Pharma developed plant derived CBD through the pipeline which is now approved for specific childhood seizure disorders
- Cost is about $32,000 per year – paid by insurance because it is FDA approved for seizure disorders
- Doctors can prescribe off label but insurance will not pay
- To get the FDA to approve it for other disorders GW Pharma would have to go through some version of the process for each indication (i.e., 5 years and lots of money)
- GW Pharma has expressed very little interest in development of Sativex in the U.S. or Epidiolex for other indications

Implications of drug development path

- Difficult to see how cannabis will ever fit the “medicine” mold as defined in the U.S.
- Which companies are going to spend $ billions to develop a product that is currently being sold in legal state markets?
  - Or that one could grow at home!!
- Even if companies were to do that, it would take 100 years before all of the work could be done for all of the different patient populations that are currently taking plant-derived cannabinoids

The FDA Is Struggling to Find an Answer

- See the recent bulletin and planned meeting
- Concern about incentives for pharma companies
- Trying to fit CBD and cannabis into the standard rubric

information to support your reasoning

6. How does the existing commercial availability of food products containing cannabis-derived compounds such as CBD (which may in some cases be lawful at the State level but not the Federal level) affect the incentives for, and the feasibility of, drug-development programs involving such compounds?

- How would the incentives for, and the feasibility of, drug development be affected if food products containing cannabis-derived compounds, such as CBD, were to become widely commercially available? How would this change if FDA established thresholds on acceptable levels of cannabinoids, including CBD, in the non-drug products it regulates? What else could FDA do to support drug development from cannabinoids?

The drug approval process does not always lead to good results

- Two cases in point – opioids for chronic pain and anti-depressants for mild to moderate depression
- The FDA can get it wrong
  - It is often not a black or white decision – reasonable people might reach different conclusions

- See Video 1 and 2 for this module

Consider Sativex in Europe

- Sativex (1:1 THC to CBD) in oral spray has been approved for some time
- It is the ONLY cannabis plant derived medicine available to most people in Europe
- Is a 1:1 oral spray the best formulation for everyone?
  - Does one size fit all work with anything? Especially cannabis?
- What if a person wants 10:1 (CBD to THC) because they don't want the THC?
- You can get that in Colorado or any number of states because these products are not defined as medicine

Why We NEED the FDA and NIH

- Without FDA regulation, CBD and cannabis companies have free reign and little oversight
  - Questions about quality control, contaminants, accurate dosing, etc.
- The industry needs some regulation, inspections etc.
- Solutions?
  - FDA needs to come up with regulatory practice that acknowledges reality (products will be available in states no matter what they do)
  - FDA needs to provide pathway for independent scientists to study the risks/benefits of these products without going through the FDA IND review (i.e., products currently on the market could be “recognized” as generally safe)
  - We need NIH funded research rather than big pharma sponsored research that is biased by goal of making billions

Summary

- Cannabis does not fit the Western definition of “medicine”
- This is partially a good thing because there is greater choice and access
  - It gives people the flexibility and freedom to figure out what works best for them
- This is also a bad thing because there is no agency that is inspecting products to be sure they are free of contaminants and labeled correctly