* Style:
  + Double spaced
  + 12pt font
  + 1 inch borders
  + ~20 pages
  + APA reference style
* Title page
* Index
  + Table of contents
  + Table of figures
* Introduction:
  + Problem definition
    - Overprescription & Toxic prescriptions (dose / duration)
      * <https://www.youtube.com/watch?v=Z2pJQ1TC8r0>
      * <https://www.youtube.com/watch?v=p4cVQLejYXc>
      * <https://www.youtube.com/watch?v=nyuZMFXzzvo>
        + “We need to ‘right-size’ prescriptions and not allow pills to be left over”
    - “What information is needed by whom to do what?”
  + Scope of our paper & approach
  + 2. Define the issue. Describe your approach and scope of the paper (10 marks)
* Historical context
  + What is the Opioid Epidemic & Opioid Dependence
    - 3. What is the issue you are addressing? Who or what does it impact? (10 marks)
  + Events & Dates
    - 4. How did the issue arise? (10 marks)
  + Legal
    - Pharmaceutical legislation
  + Covid-19
* Current status of the challenge or issue:
  + Current prescription process
  + Overprescription
    - Marketing & lawsuits
      * 5. What forces are influencing the issue? (20 marks)
  + Pharmacies
    - Patient prescription abuse
    - Over-the-counter opioids
      * Street drugs & fentanyl
    - 5. What forces are influencing the issue? (20 marks)
  + Current & future consequences
    - 4. What are the consequences of the issue not being resolved? (10 marks)

From notes in HINF140:

Opioid Crisis

* + Health Canada has called the continuing number of opioid related overdoses and deaths a national crisis.
  + It has sanctioned a number of initiatives to address the problem.
  + 17,602 apparent opioid toxicity deaths between January 2016 and June 2020
  + 1,628 apparent opioid toxicity deaths occurred between April and June 2020, representing the highest quarterly count since national surveillance began in 2016. This number also represents a 58% increase compared to January to March 2020 (1,029 deaths) and a 54% increase from the same time frame in 2019 (1,059 deaths).
  + In 2020 (January to June), 97% of apparent opioid toxicity deaths were accidental (unintentional).
* There is a law that says you have a right to make your medical decisions regardless of your age
  + “An athlete was prescribed fentanyl for many injuries and died at home due to overdose”
* Litigation and the opioid crisis
  + On November 24, 2020, the manufacturers of OxyContin, Purdue Pharmaceuticals, settled on a guilty plea with United States (US) federal prosecutors for their role in the opioid epidemic.
  + They pled guilty to charges of conspiracy to defraud the US, violation of federal healthcare reimbursement laws, and sale of opioids to doctors they suspected of writing illegal prescriptions.
  + The guilty plea provides for over 8 billion USD in forfeitures, which could bring the company’s cost from opioid litigation to as much as 12 billion USD.
* Stages of the Disease: “What information is needed by whom to do what?”
  + Socio-economic risk factors
    - 1. What are the risk factors for this disease?
    - Critical data
      * Prediction
      * Prevention
  + Disease contraction
    - Patient objectives
      * Recreational abuse
    - Physical injury & overprescription
    - Healthcare objectives (look into healthcare perspectives)
      * Doctors perspective
      * 2. Who are the decision makers?
      * 3. Information systems
      * 3. Critical data
      * 4. What information is missing, and what are we trying to do?
      * 5, 6. Information systems & medium of collection
  + Early symptoms
    - Pathology
    - Patient objectives
      * Managing withdrawals
    - Healthcare objectives
      * Pharmacy systems
      * 2. Who are the decision makers?
      * 3. Information systems
      * 3. Critical data
      * 4. What information is missing, and what are we trying to do?
      * 5, 6. Information systems & medium of collection
  + Diagnosis
    - Patient objectives
    - Lab examination
      * Patient charts
    - Testing methods
      * 3. Critical data
    - Healthcare objectives
      * Treatment options
      * 2. Who are the decision makers?
      * 3. Information systems
      * 3. Critical data
      * 4. What information is missing, and what are we trying to do?
      * 5, 6. Information systems & medium of collection
  + Maturity
    - Patient objectives
      * Relapses
    - Healthcare objectives
      * Overdose & Emergency services
      * 2. Who are the decision makers?
      * 3. Information systems
      * 3. Critical data
      * 4. What information is missing, and what are we trying to do?
      * 5, 6. Information systems & medium of collection
  + Complications leading to death
    - Overdose statistics
    - Healthcare objectives
* What should be done?
  + 6. What does the future hold? (20 marks)
  + Problem definition & system challenges
  + Target user (pharmacists & doctors)
  + New system Design
    - Linking existing systems
    - Artificial intelligence
      * Prediction / prevention
        + Critical data usage
      * Ethics & Data privacy
    - System Relationship Diagram
  + How providing information to pharmacists & doctors will help
  + Change in legislation
    - 6. What should be done? (20 marks)
* Conclusion
  + 7. Summarize your paper. (10 marks)
* References
* Appendices
* Use AI to calculate dosage and duration
* Risk factors
  + Socio-economic
    - History of abuse
    - Social isolation
    - Education level
    - Poverty
    - Geographic location
  + Demographic
    - Male
    - 30-39 years old
    - First Nations
  + Sources
    - (Maté, 2008; Hser, 2015; Silva, 1990; Waldinger, 2015)
  + Intervention (Prediction)
    - AI risk assessment
      * Demographics
      * Socio-economics
      * Social-data prediction
        + Number of friends / loss of friends / isolation
        + Family divorce
        + Large / recent move
      * Personality assessment
      * Death in the family
      * Family trauma / abuse
    - AI updates school records:
      * Promote social skills at a young age
        + Big brother’s Big Sisters
        + Sports teams
        + Social events
* Disease contraction
  + Social
    - Recreational use
    - Escapism
    - Self medication
    - Group use
  + Prescriptions
    - Overprescription
      * (Dyer, 2021; Theisen, 2018)
      * Need to suggest alternatives
      * Errors
        + <https://bpspubs.onlinelibrary.wiley.com/doi/full/10.1111/j.1365-2125.2012.04313.x>
    - Discrepancy of prescription vs need
    - Length of prescription use
    - Over the counter opioids
      * (Frei, 2010)
    - Presenting pain
    - Family prescriptions with left-over pills
      * <https://www.youtube.com/watch?v=nyuZMFXzzvo>
    - Total MME prescribed
      * <https://journals.lww.com/spinejournal/Abstract/2019/10150/Total_Inpatient_Morphine_Milligram_Equivalents_Can.17.aspx>
      * <https://jamanetwork.com/journals/jama/article-abstract/2503508>
  + Intervention (Prevention)
    - AI risk assessment
      * Demographics
      * Socio-economics
      * Social-data prediction
      * BC Pharmacare family records (opioids in the house)
      * Type of profession / career / work history
      * Divorce
      * Loss of job
    - AI Suggest alternative medications
    - AI Suggest lower dosages / shorter use times
      * Monitor conversion tables / change in medication
      * Safe use & benefits:
        + <https://www.youtube.com/watch?v=nyuZMFXzzvo>
        + Suggest alternative pain medications
        + 15% of first-time prescribers will still be dependant in 1 year
    - Type of injury / chief complaint
    - Change prescribing habits
      * Have records of a doctor’s opioid prescriptions vs opioid addiction rates
    - Train a ML Model on cases that result in opioid overdose
      * Average duration of acute pain vs prescription length
      * Timeline
      * Dosage
      * MSP habits
      * Original pain source
* Early symptoms
  + Social
    - Missing work
    - Sleeping in lots
    - Secretive
    - Changes in family/ friend behavior
      * Have a reporting system
  + Behavioral
    - Hyper-alertness / edginess
    - Diarrhea
    - Muscle cramps
    - Headaches
  + Prescriptions
    - Use changes (increasing the does)
    - Early renewals (renew on day 16 for a 20 day prescription)
    - Family members start to get opioid prescriptions
    - Increased frequency of clinic visits
    - Visiting multiple clinics to get prescriptions filled
    - Forging prescriptions / lying
    - Requesting other opioids
    - Coming in for other pain-managment conditions
      * Back pain acting
    - “Firing doctors who suspect they are at risk of addiction”
      * “Get me a new doctor”
      * <https://www.youtube.com/watch?v=p4cVQLejYXc>
    - Longterm prescriptions
      * <https://www.youtube.com/watch?v=6Fxu0ZmhpjU>
      * PLAN TO BE SICK and tapering down for withdrawls
  + Intervention
    - AI assessment (If the person has an active prescription)
      * Use social data to monitor changes sleeping habits, work habits, social habits
      * Detect use changes in prescription (what is a safe level?)
      * Family and close friends prescriptions
      * MSP data
        + Contact frequency, locations, and reasons
    - Notify a doctor to start diagnosis / methadone treatment
* Diagnosis
  + Testing
    - Urine sample testing
  + AI diagnosis using DSM5 11-questions (American Psychiatric Association, 2013)
    - Opioids taken in larger amounts over longer periods of time than intended
      * Original prescription duration vs renewals
      * Increases in dosage
    - Persistent desire or unsuccessful efforts to cut down or control opioid use
      * Renewal requests & pharmacy visits (MSP pings)
      * Emergency refills, early refills
    - A great deal of time spent in activities necessary to obtain the opioid, use the opioid, or recover from its effects
      * Trying multiple doctors / pharmacies
      * Over-the-counter opioid purchases
    - Craving, or strong desire to use opioids
      * Large changes in social data / geo-location data
        + Traveling to known “hot spots” in the city
    - Recurrent opioid use resulting in failure to fulfill major role obligations at work, school or home
      * Risk factors / job type / missing work
      * Family members report in
    - Continued opioid use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of opioids
      * Reports of small crimes / fines
    - Important social, occupational or recreational activities are given up or reduced because of opioid use
      * Infrequent social media activity (change)
    - Recurrent opioid use in situations in which it is physically hazardous
      * Geolocation
      * Mobile sleep habits / data
      * MSP pings for hospital visits
    - Continued use despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to have been caused or exacerbated by opioids
      * MSP pings
      * Prescription denials
    - Tolerance, as defined by either of the following:
      * a) a need for markedly increased amounts of opioids to achieve intoxication or desired effect
        + Early refills
        + Prescription abuse / forgery
      * b) markedly diminished effect with continued use of the same amount of an opioid
        + Increase in dosage / early refills
    - Withdrawal, as manifested by either of the following:
      * a) the characteristic of opioid withdrawal syndrome
        + Purchasing of alternative pain medications
      * b) the same (or closely related) substances are taken to relieve or avoid withdrawal symptoms
        + Family / friends prescriptions data
* Maturity
  + Social
    - Isolation
    - Theft
    - Criminal activity
    - Incarceration
      * Before
      * During
      * After release
    - Loss of employment
    - Loss of housing
    - Loss of financial savings
    - Loss of social connections
      * (Kosten, 2002; Sutter, 2017)
  + Behavioral
    - Muscle aches
    - Stomach pain
    - Fever
    - Vomiting
    - Anxiety
    - Diarrhea
    - Opioid cravings
    - Compulsive / obsessive behavior
    - Depression
    - Dehydration
    - Weight loss
    - Public consumption
  + Hospital
    - Coming in for symptoms of Hepatitis or HIV
  + Treatment
    - Taper plan
      * Longterm prescriptions
        + <https://www.youtube.com/watch?v=6Fxu0ZmhpjU>
        + PLAN TO BE SICK and tapering down for withdrawls
* Complications leading to death
  + Social
    - Seeking street drugs
    - Staying private rooms (hotels, motels)
    - Consuming without supervision
      * (Somerville, 2017)
  + Drug use
    - Higher doses to manage same effect
    - Overdose apps
  + Hospital
    - Will enter the hospital for overdose or unrelated trauma
    - Found by paramedics
      * Naloxone

What causes opioid dependancy

1. Possibility of discrepancy of prescription vs need
2. Length of use
3. Use changes (increasing the dose)
   1. Wider network: using others to buy opioids
      1. They will try to lie
         1. 20 day prescription
            1. 16 day renewal

Why the increase

* + - 1. Family members start to get opioid prescriptions

What are you trying to identify??

* Correcting prescri
* Frequency of visits
* Behavioiur
* “hammer-ing” doctors

Is there a threshold of how effective opioids can be without being addictive

“Notify an opportunity to reduce the opioid”

Don’t care if the data is available, what databases are there, ethics, etc

Only focus on “what you need to know and where you need to interject”

There is a journey from Day1 to Death…. What are the critical points on this journey where you can change the trajectory of this journey. What information do you need to do that, how do you collect it (who), and who gets it

“What information does the family need to collect?” Do you see these things in your child?

* Sends it to a system
* Feeds it to school mental health services

Story

1. Opioid intake and prescription
   1. Broken leg
   2. If you use them well, it’s not a problem
   3. Some people are susceptible
2. Develops psychological and physiological dependency for it
3. Using street drugs
   1. Hyper concentrated substances

The primary decision to give someone pain killers in the first place should be done through a doctor. Not sure a computer can take a holistic view of a person to decide

Combine pharmacies with counseling offices and talk to a psychologist

So we can help you work to get off the drugs, and work on the life factors that make you want to use the drugs

Needs to be a more rigorous process that a person needs to go through for someone to get prescribed

* He would just go in and say “I need to give some to my friend this week” and get a prescription

Story of Jess’s uncle

* Mom’s brother
* Was adopted
* Don’t know much about his biological mother
* Had him when she was 15
* She struggled with substance abuse himself
* “When my mom was 7 and he was 3, the family went through a divorce”
* Moved in with his dad
* Started smoking weed
* Droped out of school
* Had learning disabilities
* Theft
* Couldn’t hold down a job
* Not a lot of support
* Broke his hip
* Was first prescribed oxycontin
* Claimed he had epilepsy and claimed he had a seizure when he fell down
* Did doctor hop
* Make excuses that he lost them, needed to get more
* He was abusing them to get high
* His Dad moved to Thailand
* Wasn’t there to support him
* Was using nonprescribed drugs
* Street drugs
* Heroine
* Cocain
* “This doctor has a medical license and had been prescribing him for over a decade
* “Maybe he needs a psych evaluation” - flaw in the system
* “Sad to see someone’s life and someone just being constantly let down
  + Younger
  + , not fitting in
  + Parents get divorced
  + Try a bit of pot
  + Start stealing
  + No support
  + It’s a societal issue
    - How are we going to prevent people from going down this road in the first place?
    - This is beyond the scope of just this disease

“We just need to talk about things more- why don’t we talk more about drugs and sex??”

“

* “I was interviewing my mom and it seems like the family blames him”
* Different things at every stage of his life could have prevented it
  + There’s prevention, then dealing with it once it happens
  + Uvic

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