Learning objectives

• Clarify the purpose of urine drug testing (UDT)
• Distinguish between UDT for detection of illicit drug use and monitoring adherence to treatment plan
• Describe practicalities of UDT
• Understand the interpretation of UDT results
• Understand limitation of UDT
Basics

- Urine drug testing must always be discussed with patients ahead of time; it is part of the physician-patient agreement which all patients on MMP sign.
- All patients must be treated the same way, and always with respect.
- UDT is not a means of punishing—rather, it is a tool to help best management.
Background to UDT

• Urine is the best biologic specimen for detecting certain drugs
• Longer window of detection for most drugs
• No standard test for all drugs, so “screening” may be a misnomer, hence the title “urine drug testing”
• Must be used in context of detailed history of all medications
• Must be undertaken in a respectful way and honest way
Why?

• To ensure that prescribers can help and support MMP patients to begin recovery and achieve stability

• Provides objective evidence of compliance with the treatment plan
  – Are patients taking medications as prescribed?
  – Are patients using illicit substances?
  – Adjust treatment plans if necessary to work towards best outcomes for patients on opioids for opioid addiction or chronic pain
Why?

• UDT is only one of several ways in which physicians can assess patients’ stability
  – Careful history taking
  – Frequent reassessment
  – Contact with pharmacist
  – Collateral information
Value of self-reporting of non-compliance

• Can be unreliable in patients suffering from addiction disorders

• If UDT is found to be discordant with history of medications:
  – review medical records
  – review PharmaNet
  – collateral information from significant others
How?

• Enzyme immunoassay (EIA)
  – Specific anti-drug antibody added to urine—if that drug is present, antibody binds to drug giving a measurable indicator reaction as “positive”

• MMP protocol tests for:
  – methadone metabolite
  – opiates
  – cocaine
  – benzodiazepine
  – methamphetamine
  – oxycodone
How?

- Gas or liquid chromatography
- Mass spectroscopy
  - GC separates and quantifies drug components
  - MS specifically identifies them
  - Gold standard of urine toxicology but expensive
  - Each test is about $75
  - Should be used for clarification where there is a question about drug identification on EIA
UDT – how?

**Supervised (is preferred method)**

Patients remove bulky clothing, leave bags with staff, specimen is temperature tested before being sent to lab for appropriately ordered test or for POC testing.

**Witnessed (in special circumstances)**

Patient witnessed while producing specimen. Less commonly used as can be seen to be intrusive and demeaning. May at times be necessary.
Washrooms and standards for UDT collection

- Should be on the methadone clinic or family practice office premises
- Hot water should be turned off
- Lab tech or staff member should have immediate access to UDT specimen for temperature strip check
- If unusually pale, this should be noted or specific gravity checked
- If specimen does not meet temperature requirements, the patient should be requested to produce another specimen
When?

- May be collected at the time of clinic visit
- Random samples—collected at varying intervals every three or four months and tested
  - Random is the standard all patients with methadone carries
Opiates, opioids: UDT

- **Natural Opiates**
  - opium
  - morphine
  - codeine
  - heroin

- **Synthetic Opiates**
  - methadone
  - buprenorphine
  - oxycodone
  - fentanyl
  - hydromorphone

Opiates POS: opium, morphine, codeine, heroin

Opiates NEG: methadone, buprenorphine, oxycodone, fentanyl, hydromorphone
UDT limitations

- Cocaine is highly specific as the antibody reacts only to cocaine and its principle metabolite
- Amphetamine/methamphetamine highly cross reactive and detects other sympathomimetic amines (e.g. ephedrine and pseudoephedrine)
- Opiate testing does not distinguish between morphine, heroin and codeine
- Does not always detect semi-synthetics (e.g. hydromorphone)
- Oxycodone needs its own specific antibody
- Methadone and buprenorphine also need specific antibody
Drugs of interest to methadone prescribers: oxycodone

- Is a semi-synthetic opioid, shows up in only about 10% positive tests
- There is a specific EIA for oxycodone that is reliable and is included in point of care (POC) test kits
- Problems associated with oxycodone screening include false negatives for patients for whom oxycodone has been prescribed
Other synthetic opioids – fentanyl

- Wholly synthetic and does not react with EIA morphine antibody. Needs either a specific EIA or GCMS to confirm presence or absence.
- Patients who are on fentanyl and show positive for opiates which is not possible using standard tests are using other opioids which react with the standard EIA testing.
Methadone

• Is a wholly synthetic opioid which does not show up on standard testing – needs a specific EIA for methadone metabolites which is virtually 100% sensitive

• All UDT kits, whether point-of-care testing or in labs, use the specific EIA for methadone metabolites to eliminate possibility of adulteration with methadone
Hydromorphone

- Is a semi-synthetic opioid which may or may not show up on routine UDS with standard opioid EIA testing but more likely to show up if very high dosing
- Will require GCMS or specific EIA to confirm presence or absence
Buprenorphine

- Is a semi-synthetic morphine-based molecule which has been so altered that does not show up on standard opioid EIA testing
- Specific and highly reliable EIA tests available in labs and in point-of-care test kits
- Is now becoming more widely prescribed and there is a specific simple dip stick test which can be used
Benzodiazepines

- Should be monitored by UDT, as are contraindicated for patients on the MMP
- EIA for benzodiazepines is based on the oxazepam antibody
- Shows reliably positive test for diazepam and alprazolam
- Do not detect clonazepam or lorazepam reliably
  - GCMS may be needed to identify both these benzodiazepines
POC testing

- POC testing now commercially available, simple to perform and gives rapid information while patient is in the office
- Several companies are involved in production
- Is covered by MSP
- Uses immunoassay methods with all the advantages and disadvantages
POC testing

• MMP protocol POC also tests for:
  – methadone metabolites
  – opiates
  – cocaine
  – benzodiazepines
  – amphetamine
  – oxycodone
  – fentanyl +/- hydromorphone +/- buprenorphine (in light of current trend)
## Urine detection time frame

<table>
<thead>
<tr>
<th>Substance</th>
<th>Detection Time Frame</th>
</tr>
</thead>
<tbody>
<tr>
<td>Methadone</td>
<td>4–5 days</td>
</tr>
<tr>
<td>Opiates</td>
<td>2–3 days</td>
</tr>
<tr>
<td>Cocaine/metabolites</td>
<td>2–4 days</td>
</tr>
<tr>
<td>Benzodiazepines</td>
<td>1–42 days</td>
</tr>
<tr>
<td>THC single use</td>
<td>2–3 days</td>
</tr>
<tr>
<td>THC habitual use</td>
<td>up to 12 weeks</td>
</tr>
<tr>
<td>Methamphetamine</td>
<td>3–5 days</td>
</tr>
<tr>
<td>Alcohol</td>
<td>6–24 hours</td>
</tr>
</tbody>
</table>
UDT interpretation

- What shows in UDT is important
- What does **not** show in UDT is equally important
  - Methadone metabolites if methadone prescribed
  - Benzodiazepines especially clonazepam
  - Synthetic and semi-synthetic opioids
  - Beware of very dilute urine, may be an attempt to dilute out drug metabolites
- PharmaNet essential to confirm what patients should be taking if prescribed
- Results should always be reviewed with the patient
Limitations of UDT

• Assesses the presence or absence of a particular drug and/or metabolite at a specific threshold of concentration at a specific time

• Unexpected result does not diagnose:
  – abuse or addiction
  – physical dependence
  – diversion

• Does not provide accurate information on:
  – time of last use
  – amount and frequency of use
Potential harms of UDT

• Incorrect interpretation of UDT could result in
  – Unwarranted discontinuation of opioids
  – Damage to physician/patient relationship

• If very unexpected result, especially with POC testing, always get laboratory confirmation

• Potential for false reassurance
  – Adulteration
  – Alteration of behaviour in anticipation of UDT, hence need for random UDS
Consequences of positive urine drug test

- Always review results of UDT with patient
- UDT result is one of many factors taken into account when making clinical decisions
- Review physician/patient agreement
- Review treatment plan
- Increase frequency of office visits
- Methadone dose if opiate positive: is it appropriate?
- May have to discontinue carries in the face of instability
- Increase counselling and other support services
Conclusion

- Urine drug testing is an important part of the comprehensive care of patients who are on MMP or are receiving opioids for chronic pain and must be undertaken in a respectful, non-judgmental manner.
- Should be considered as an objective test within the greater biopsychosocial context.
- Should always be interpreted in the context of broad based clinical care of the individual patient.
Thank you