



## Drug diversion

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### Abstract

Drug diversion refers to the misappropriation of prescription medications for illicit use, which poses significant challenges to public health and safety. This issue arises when legally prescribed drugs are diverted from their intended medical purpose, often leading to misuse, addiction, and criminal activities. Factors contributing to drug diversion include inadequate monitoring systems, prescription fraud, and the increasing availability of medications. Addressing this problem requires a multifaceted approach involving enhanced regulatory frameworks, improved education for healthcare providers and patients, and the implementation of robust tracking systems. Effective interventions can mitigate the risks associated with drug diversion, ensuring that medications are used safely and appropriately.

### Key word

1. **Prescription fraud:** illegally obtaining prescriptions through deceitful means.
2. **Misuse:** using medication for purposes other than prescribed.
3. **Illegal distribution:** selling or giving away prescription drugs without authorization.
4. **Addiction:** dependence on prescription medications, leading to misuse or diversion.
5. **Monitoring programs:** systems in place to track prescriptions and prevent diversion.
6. **Regulatory compliance:** adhering to laws and regulations surrounding prescription medications.
7. **Pharmacy theft:** stealing medications from pharmacies or healthcare facilities.
8. **Controlled substances:** drugs that are regulated by law due to their potential for abuse.
9. **Patient abuse:** patients manipulating the system to obtain prescriptions.
10. **Intervention programs:** strategies aimed at preventing drug misuse and diversion.





## Summary

Drug diversion, which refers to the transfer of legally prescribed controlled substances to others for illicit use, carries serious health, legal, and social consequences. A large proportion of overdose deaths are linked to the misuse of prescription drugs, especially opioids and benzodiazepines. These diverted drugs often come from family members or friends but can also be sourced from overseas pharmacies, illegal labs, or purchased from drug dealers.

To address this issue, good prescribing practices play a key role in mitigating drug diversion. In Australia, systems are being implemented to monitor the prescribing and dispensing of controlled substances. These systems aim to prevent misuse and ensure that medications are used responsibly, contributing to public health and safety.

## Introduction

Prescription drug diversion is defined as the unlawful channeling of regulated pharmaceuticals from legal sources into the illicit market. This includes actions such as transferring prescription drugs to individuals who were not intended to receive them. This illegal practice undermines the medical purpose of controlled substances and contributes to significant public health concerns, including addiction, overdose, and the growth of illegal drug markets.

## Scope

The diversion of prescription drugs has been a significant issue in Australia and globally for over 25 years, affecting a broad spectrum of areas, including incarceration of individuals under the influence of these drugs and confrontations in healthcare settings. This situation leaves healthcare professionals vulnerable and unsupported when managing patients who may be misusing their

prescriptions, leading to ethical and practical challenges in patient care.

One of the most alarming outcomes of drug diversion is the rising number of overdose deaths associated with prescription medications. However, it remains challenging to determine the exact number of deaths resulting directly from drug diversion versus complications from legitimate prescribed use. For instance, analyzing coronial data on oxycodone-related deaths found that only 39% of the deceased individuals had a legitimate prescription for the drug, highlighting the widespread diversion of opioids.

Measuring the scale of prescription drug diversion is difficult. Studies suggest that opioid diversion increases with the number of prescriptions issued without supervised dosing, and decreases when heroin is more readily available. In Australia, the number of opioid dispensings skyrocketed from 500,000 in 1992 to 7.5 million in 2012, reflecting the growing use and potential for misuse of these drugs.

Data from needle and syringe programs indicate that the proportion of users injecting pharmaceutical opioids rose from 9% in 2005 to 16% in 2009. Diverted pharmaceuticals are often used alone or in combination with alcohol and other illicit recreational drugs, such as cannabis. The pharmacological characteristics of these drugs, including their rapid onset of effects and potency, contribute to their desirability in the illicit market. For example, a single 2 mg tablet of alprazolam can produce similar effects to four 5 mg tablets of diazepam, making it more attractive for misuse.

Other commonly diverted drugs include those listed in the associated table, further emphasizing the wide range of pharmaceuticals that are subject to diversion for non-medical use.

## Points of diversion

The diversion of pharmaceuticals involves the unauthorized redirection of prescription drugs from their intended medical use to illicit channels. This can happen at various stages of the supply chain, but the most common point is at the practitioner-patient interface. Primary healthcare settings are especially vulnerable to this, with patients sometimes diverting drugs they receive from hospitals or influencing their general practitioners to prescribe more.

### commonly diverted drugs

Class	Drugs
Benzodiazepines	All
Opioids	All
Stimulants	Dexamphetamine
	Methylphenidate
Antipsychotics	Olanzapine
	Quetiapine
Anaesthetics drugs	Ketamine

In studies of prison inmates, it was found that 21% had obtained prescription drugs directly from a doctor, while 43% received them from friends or family before their incarceration. A smaller proportion of inmates used forged or stolen prescriptions. Other sources of diverted drugs include drug dealers and online vendors, with online purchases becoming increasingly common. Some isolated cases of diversion involve theft from pharmacies, clinical waste, or even aged-care facilities, though these sources are harder to measure in terms of their overall contribution to the problem.

In the united states, older individuals and chronic pain patients are identified as primary sources of prescription drugs being sold on the streets.

## Prevention strategies

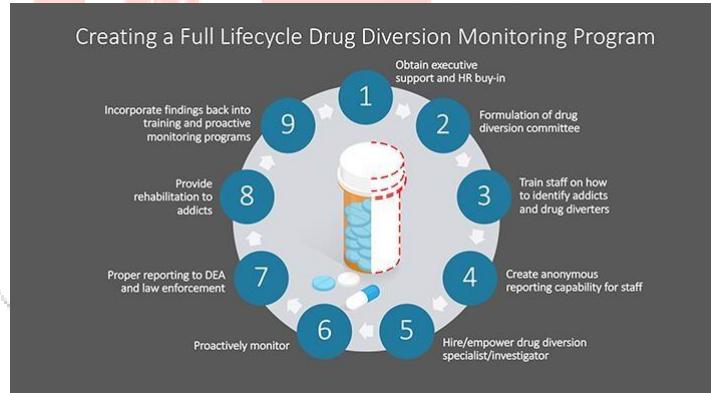
The national pharmaceutical drug misuse framework for action is a comprehensive strategy designed to combat the increasing misuse of prescription drugs, particularly opioids. It involves a multi-faceted approach to improving the safe and responsible use of medications. Key components of this framework include. Establishing better systems for tracking and monitoring prescriptions to prevent over-prescribing or inappropriate dispensing. Offering education and resources to help healthcare professionals make informed decisions and spot potential drug misuse. Enhancing the general population's understanding of the risks associated with prescription drug use, as well as promoting safe practices. Implementing measures like needle exchange programs and naloxone distribution to minimize the harm associated with drug misuse. Strengthening laws and regulations to prevent the illegal diversion of prescription medications, while ensuring that legitimate patients still have access to necessary treatments. By addressing these areas, the framework aims to mitigate the harm caused by the misuse of prescription drugs and reduce the overall rates of dependency and abuse.

## Drugs monitoring

The safe prescribing and dispensing of controlled substances. The electronic recording and reporting of controlled drugs (ercd) system, as part of a broader framework, aims to mitigate issues related to prescription drug misuse and ensure that healthcare professionals have access to accurate and up-to-date data to make informed decisions. By providing real-time information on patient prescription history, the system seeks to reduce "doctor shopping" and the inappropriate prescribing of restricted substances.

However, the current prescription shopping information service (psis) operated by medicare has significant limitations. While it flags potential misuse based on a threshold of prescribers or prescriptions within a given time frame, it does not provide a comprehensive or real-time overview of a patient's medication history, potentially allowing some cases of misuse to slip through the cracks. Additionally, systems that require patient consent and only provide retrospective data may not be effective in preventing drug diversion in real-time, further complicating efforts to combat prescription drug abuse.

In sum, while drug monitoring systems, such as the ercd, can play an important role in addressing prescription drug misuse, they are not foolproof. Their **utility is still being** evaluated as part of ongoing efforts to improve patient safety and curb the diversion of controlled substances. Expanding these systems nationally could be a step toward better-controlled drug monitoring in australia.



## background

Drug abuse is defined as a patterned use of a substance in which the user either intentionally or unintentionally causes him or herself harm or causes harm to others. It can also be classified as an intentional misuse of labeled, and provider instructions to achieve a desired altered state. It's estimated that over 25 million americans use illicit drugs, and this number continues to rise. Of these individuals, 7 million are estimated to use prescription drugs for a purely nonmedical purpose. Unfortunately, because of their ease of access, healthcare workers aren't immune to the growing problem of substance misuse abuse. With more than 3 million practicing nurses in the us, it's estimated that over 300,000 of them, or more than 10%, are abusing substances, according to the national institute on drug abuse. Although nurses typically don't abuse drugs or alcohol at a higher rate than the general public, the differences lies in the types of drugs abused. Nurses tend to abuse prescription medications, such as amphetamines, opioids,

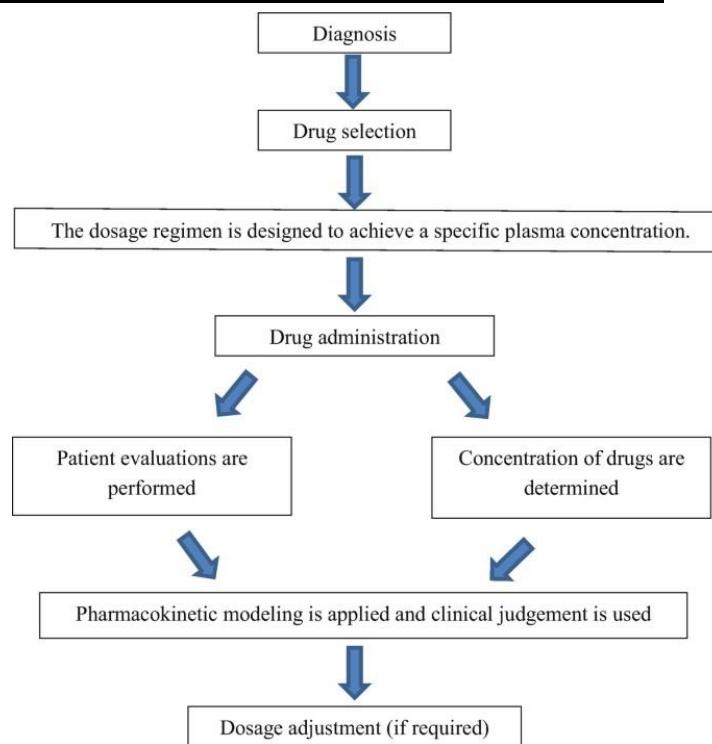
sedatives, tranquilizers, and inhalants this coincides with their workplace environment.<sup>4</sup> behaviors that may suggest diversion include irritability, nervousness, pupil changes, and working excessive amounts of additional shifts. Addiction is the number one reason for healthcare professionals to divert controlled substances.<sup>5</sup> nurses typically divert drugs using one of the following methods.<sup>4</sup>

Taking the wasted portion of the drug for personal use, removing excessive amounts of as-needed medications, not administering the drug to patients, administering a substitute substance to patients. Health systems have a moral and legal responsibility to audit and monitor the administering.

### Software selection

First, a multi-disciplinary team composed of nursing and pharmacy leaders was created to develop selection criteria and evaluate the software products. Selection criteria were based on ease of use, initial cost, annual maintenance, and implementation/ compatibility with current hardware. Next, the team approached the procurement and logistics department to determine the list of approved vendors. Because the health system previously invested in the ADC hardware, it was important that the software be compatible. Once vendors were identified, they were invited to present their products to the team. The team chose a diversion detection software product compatible with the ADCs currently in use. Data security is of paramount importance, so the software is password-protected, allowing restricted access to only assigned members of the diversion detection team. Another benefit of using the diversion detection software is the identification of non-standard processes used on the clinical units, which allows the health system to standardize medication administration. For example, some clinical areas were removing opioids from the ADC before pain assessment. Although this saves time, the practice was causing discrepancies and miscount because some RNs forgot to return the medications to the appropriate ADC. The enhanced diversion detection process has led the nursing staff to be more diligent regarding controlled substances management.

**Implementation** Working with the detection software, it was necessary to develop an operational reporting dashboard designed to correlate specific analytical data to help detect potential drug diversion from the ADCs. The software package allowed the team to assign a percentage score to any health system employee with access to the ADC infrastructure. This percentage score was based on multiple metrics, including the work area, full- or part-time status, and historical trends of the individual user and departments. The parameters set a baseline measurement to account for the usual and customary ADC opioid pull amounts for a given area of the health system. For example, a nurse working full-time, 12-hour shifts on a surgical ICU may have a greater opioid pull volume than a part-time working in a rehabilitation setting. By customizing the parameters, the team can identify potential diversion.



It sounds like you're describing a structured approach to monitoring and detecting potential drug diversion in a healthcare setting, particularly with the use of an algorithm that accounts for different medication administration patterns across units. The diversion detection team plays a crucial role in ensuring accurate data analysis and determining whether a healthcare provider's usage patterns indicate potential diversion or are consistent with the specific unit's norms. This process likely increases the ability to detect early signs of diversion while reducing false positives, especially when considering differences like the frequency of controlled substance administration in areas like post-anesthesia care units versus medical floors. If you need help refining or expanding on this, feel free to ask!

### After diversion is detected

This approach emphasizes both accountability and support. While protecting patient safety remains paramount, it is commendable to offer assistance to the impaired nurse through counseling, drug testing, and reassignment to safer areas. The balanced response acknowledges the nurse's potential for rehabilitation while ensuring the safety of others. However, when the situation escalates, such as when diversion of substances is linked to personal financial gain, the necessity of involving law enforcement and potentially terminating employment becomes clear. It's a delicate process requiring both compassion and strict adherence to legal and ethical guidelines..

### Reformulation of pharmaceuticals at risk of diversion

Reformulation of a drug into an abuse-deterrent preparation is a strategy that has been adopted to mitigate the diversion of pharmaceuticals. The primary aim of reformulation is to prevent the intravenous use of oral preparations. Temazepam was previously available in gel caps and tablets. The gel caps were deemed easier to inject than the tablet formulation and they were withdrawn from the market in 2004 following numerous reports of abscesses, thrombophlebitis and cellulitis associated with their use.

A tamper-resistant formulation of oxycodone was introduced in Australia in 2014, several years after it was introduced in the USA. At this preliminary stage, there are conflicting reports on whether this has stemmed the misuse of one of the most commonly diverted opioids or simply shifted use to other formulations. Early findings from the National Opioid Medication Abuse Deterrence Study show a decline in pharmacy sales of oxycodone 80 mg following the introduction of the abuse-deterrent formulation. Previously, this was the most commonly diverted dose by people who inject drugs. In addition, there are various means of overcoming the tamper-resistant formulation to facilitate intravenous use.

## Training

The recognition of improved training for doctors in identifying and treating addiction is indeed crucial for minimizing pharmaceutical diversion. The role of specialist bodies, such as the Royal Australasian College of Physicians and the Royal Australian College of General Practitioners, is vital in establishing guidelines for responsible prescribing practices regarding drugs of dependence.

To address the limited exposure to addiction training in medical education, a system of prescriber credentialing has been proposed. Such a system would enhance the qualifications of prescribers and ensure they are equipped with the necessary skills and knowledge to manage patients with substance use disorders effectively. While some states, like New South Wales, have implemented initiatives like the Opioid Treatment Accreditation Course, which focuses on treatment within specific programs, there is a need for a broader approach.

Expanding credentialing programs to include comprehensive training on addiction and substance use management can help create a more standardized approach across the country. This would not only improve patient care but also contribute to reducing the risks associated with the inappropriate prescribing of controlled substances. By fostering an environment where healthcare professionals are better trained and more aware of addiction issues, we can work towards a more responsible approach to prescribing and minimize the potential for pharmaceutical diversion.

## The evaluated pdd schemes

Please provide the text or elaborate on the key points you'd like summarized from the pdd (Police Diversion for Drug-involved Suspects) schemes in Durham, Thames Valley, and the West Midlands. I'd be happy to assist with the summary:

The manuals for each pdd scheme were created in collaboration with local stakeholders, based on the Tidier checklist by Hoffmann et al. (2014). This ensures a standardized approach to intervention description and replication.

All three pdd schemes aim to divert these individuals from prosecution. Instead of legal action, they are offered educational sessions about drug use and advice, with the possibility of referral to additional services (e.g., local drug treatment agencies).

The program allows a broader range of offenses for eligibility. Diversion is conducted through one-on-one meetings with police staff known as "navigators."

In these areas, diversion is limited to individuals suspected solely of simple drug possession (without intent to supply). Interventions

are provided by third-sector organizations and typically occur through online or in-person sessions.

The ongoing evaluation will focus on understanding the different mechanisms and outcomes triggered by these varying interventions across the three regions.

This structured approach allows for a detailed examination of how different methods of intervention can affect the outcomes for drug-involved suspects, ultimately aiming to inform future practices and policies.

The study employs a mixed methods realist evaluation design, integrating both qualitative and quantitative approaches to provide a comprehensive assessment of the pdd schemes. Here's a breakdown of the key components of the study design:

This study combines qualitative and quantitative research methods to gain a holistic understanding of the pdd schemes.

The qualitative component will explore the implementation of the pdd schemes, the contexts in which they operate, the mechanisms at play, and any moderators that might influence outcomes.

This assessment aims to understand how different contextual factors affect the effectiveness of the interventions for drug-involved suspects.

This involves analyzing administrative data to evaluate the effects of exposure to pdd schemes on reoffending rates and health outcomes among participants. The analysis will utilize existing data sets to provide evidence of the schemes' impacts.

The study will also assess the cost-effectiveness of the pdd schemes, evaluating whether the benefits of reduced reoffending and improved health outcomes justify the costs of implementing these programs.

This component will investigate the fairness of the pdd schemes' implementation and their effects across different populations, ensuring that no group is disproportionately disadvantaged.

Finally, a realist synthesis will be conducted to integrate findings from both qualitative and quantitative analyses, helping to explain how and why the pdd schemes work (or do not work) in various contexts.

This comprehensive design aims not only to evaluate the immediate impacts of the pdd schemes but also to inform future practices and policies by understanding the underlying mechanisms and contexts that drive their effectiveness.

## Work package 1:

The development of intervention manuals and a theory of change for the pdd schemes was a collaborative effort that involved significant stakeholder engagement across multiple workshops. Here's a detailed overview of this completed phase of your work:

A series of in-person workshops were held in each of the three focus areas (Durham, Thames Valley, and the West Midlands) along with a national stakeholder workshop. Over 70 stakeholders participated, including:

- local police officers and managers.

- staff and managers from agencies providing interventions (e.g., nhs liaison and diversion services, public health substance misuse leads).
- representatives from user voice and local partner agencies. prior to the area workshops, police staff and intervention agencies submitted draft descriptions of the pdd schemes, adhering to the tidier checklist (hoffmann et al., 2014).

A preliminary version of the pdd theory of change was also prepared, setting the stage for in-depth discussions during the workshops. During the workshops, stakeholders discussed practical examples of how the pdd schemes operate, allowing for the identification of gaps and areas for clarification.

These discussions led to refined and more detailed descriptions of the pdd schemes. Scenarios were shared to elicit operational insights from police officers and staff on how they would apply diversion in specific situations. The refined scheme descriptions from the area workshops were presented at a national meeting, facilitating agreement on the updated theory of change and the area-specific scheme descriptions. This structured development process, characterized by extensive stakeholder involvement and evidence-based approaches, strengthens the foundation for the effective implementation and evaluation of the pdd schemes, ultimately aiming to improve outcomes for drug-involved suspects.

**Work package 2:** your excerpt outlines a comprehensive qualitative process evaluation of pdd (police diversionary drug) schemes across durham, thames valley, and the west midlands. Here's a structured overview of the main components of the evaluation based on your provided text:

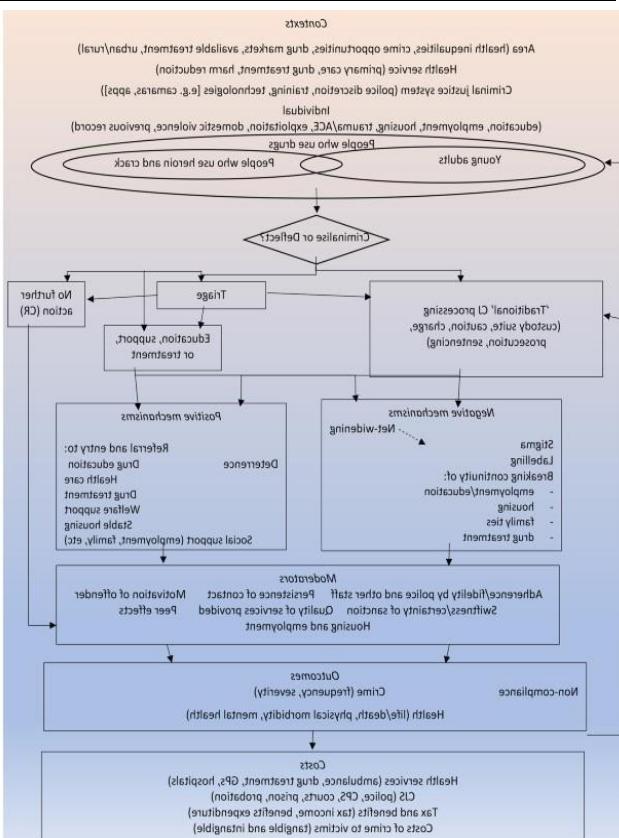
This structured overview provides clarity on the aims, methods, and processes involved in the evaluation of the pdd schemes. If you need further elaboration or specific sections written up in more detail, feel free to ask!

Ethnicity and length of service. Interviews will also be carried out with staff from the organisations that deliver the diversion programmes and other support services to which people who are diverted are referred (e.g. Drug treatment, housing and employment

Research participants who are drug-involved suspects will include: service users who were eligible for diversion, have been diverted, and are fully or partially participating in diversion schemes; and people who were eligible for diversion but were not diverted or are not participating.

Interviews with drug-involved suspects will be carried out by user voice's peer researchers. Interviewees will be selected purposively to inform us on a range of experiences according to gender, ethnicity, age, type of drug use (e.g. Infrequent/frequent cannabis use, infrequent/ frequent cocaine use, dependent use of heroin), and engagement in the diversion scheme (none/partial/full).

We will also gather aggregate police force level data for our three focus areas on the numbers of people who: are contacted as drug- involved suspects; are diverted to pdd schemes; participate in such schemes; complete the scheme; receive an oocd; or receive some form of criminal justice sanction (e.g. Caution, charge, sentence). We will ask for these data to be provided for each year from three years before the start of each pdd scheme to march 2024, and broken down by age group, gender and ethnicity. This will inform our analysis of implementation fidelity, as well as our equity assessment in work package 5.



Interviews and focus groups will be transcribed anonymised and imported into nvivo software for computer-assisted qualitative data analysis (dalkin et al., 2021). We will also include memos on our descriptive analysis of the aggregate data in the qualitative dataset. Following adaptive theory (layder, 1998), provisional codes for the analysis have been derived from our refined theory of change (see fig. 1) and the conceptual frameworks we drew from emmie (johnson et al., 2015), victore (cooper et al., 2020) and carroll et al. (2007). Through a hybrid process of deductive and inductive reasoning and close reading of interview and focus group transcripts, as well as ‘attached memos’ (dalkin et al., 2021), we will develop a final set of core and satellite thematic codes. These will form the basis for writing up findings on the contexts, mechanisms, moderators and outcomes of the three pdd schemes, and our analysis of the fidelity of implementation.

### Work package 3: quantitative outcome assessment

Your quantitative outcome assessment seems well-structured for examining the impact of police-driven diversion (pdd) schemes on health and offending outcomes for drug-involved suspects. Here are some considerations and steps you might take to enhance your analysis:

1. **Cohort definition:** clearly define your cohorts of drug-involved suspects, specifying the criteria for eligibility for diversion. Ensure that the cohorts are as similar as possible to control for confounding variables.
2. **Outcome measures:** specify the health and offending outcomes you will measure. Common indicators might include rates of reoffending, substance use, mental health status, emergency room visits, and other health-related metrics.

3. **Statistical methods:** outline the statistical methods you will use to compare the outcomes between the intervention and comparison areas. Techniques such as propensity score matching, regression analysis, or difference-in-differences might be appropriate.
4. **Data sources:** identify and describe the data sources you will use for your analysis. This could include police records, health data, and demographic information.
5. **Limitations:** acknowledge any potential limitations of your study, such as biases in data collection, differences in reporting practices between police forces, or unmeasured confounding factors.
6. **Ethical considerations:** address any ethical considerations related to working with vulnerable populations, ensuring that data is handled with confidentiality and respect.
7. **Expected outcomes:** discuss the anticipated implications of your findings for policy and practice in relation to drug diversion strategies.

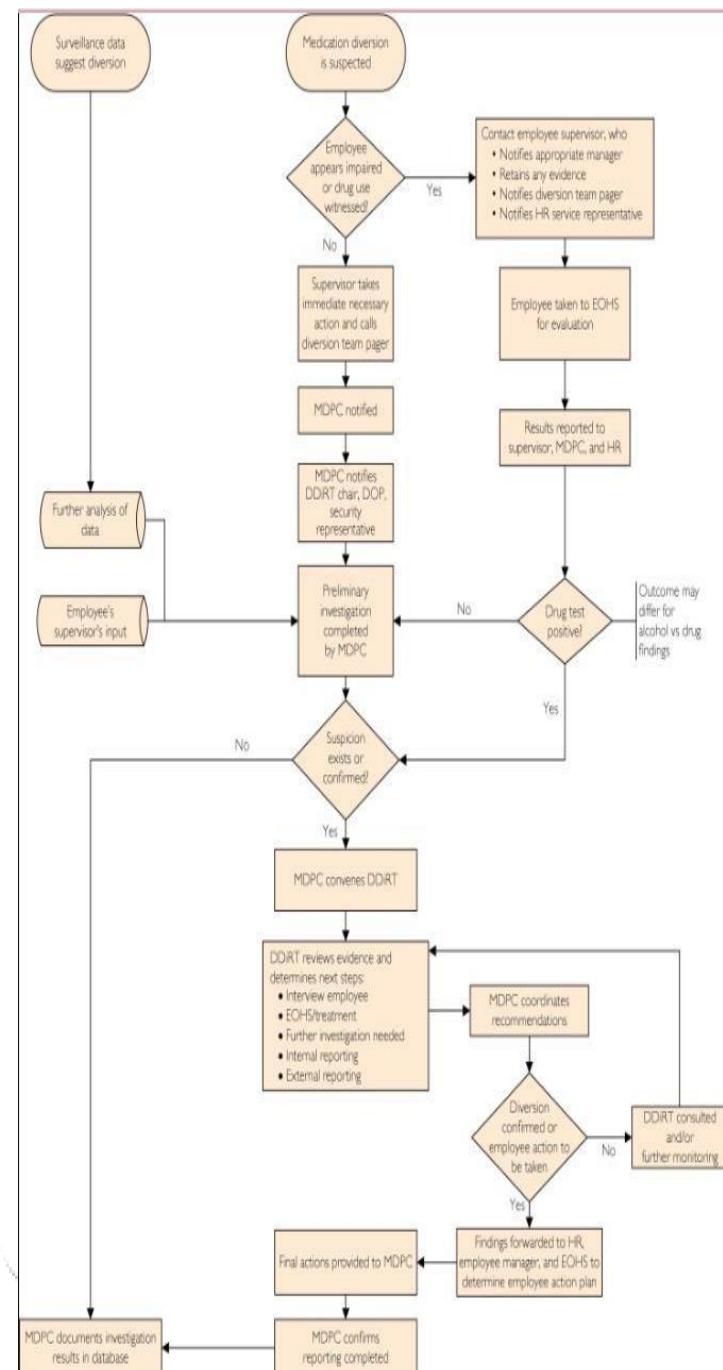
#### Work package 4: cost-consequence analysis

your approach to evaluating the economic effects of police- driven diversion (pdd) using a cost-consequences analysis (cca) framework is sound. Here are some suggestions to enhance your methodology and clarity:

- Stakeholder perspectives
- Cost estimation
- Unit costs

Economic impacts of the pdd schemes, facilitating informed decision-making among stakeholders.

Your plan for the cost-consequences analysis (cca) using a hybrid decision tree and markov model is thorough and well-conceived. By integrating these measures into clinical practice, healthcare professionals can significantly reduce the risk of drug diversion and misuse, ultimately enhancing patient safety and treatment outcomes..



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