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# All Wales Alliance for Research and Development in Health and Social Care

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# How to stop drug users dying from an overdose

## A systematic review of interventions to prevent and treat opiate poisonings

[www.awardresearch.org.uk](http://www.awardresearch.org.uk)



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## *Project/authorship team*

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Commissioner: Welsh Assembly Government  
(Welsh National Monitoring Group into Drug Related Deaths)

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## *Background*

- Deaths from opiate overdose in the UK are among the highest in Europe
  - Drug related deaths in England are rising (1,617 in 2008)
  - Number of deaths in Wales fell from 110 (2007) to 96 (2008)
- Factors increasing risk of death:
  - older heroin-dependent males
  - not in drug treatment
  - injecting drugs and polydrug use
  - homelessness
  - changes in tolerance eg. after periods in prison
  - overdosed in past year
- Naloxone is administered to reverse opiate overdose by paramedics and in emergency departments



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## *Study aims*

- To describe interventions to prevent and treat overdoses in the pre-hospital setting
- To review their effectiveness



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# *Methods*

- Systematic literature search for descriptions of interventions
- Systematic review - selection of comparative studies for descriptive analysis
- Meta analysis of combinable data

- Literature search of six data bases and handsearching
  - Any research methodology
  - Published since 1998 in English
- Structured screening and assessment of abstracts
- Structured data extraction, enhanced for identified comparative studies
- Assessment of research quality and level of evidence

# *Service user involvement*

- 4 meetings with service users and staff at a drugs charity drop-in session
- 10 users: 7 men; 8 had overdosed at least once; all had witnessed overdoses
- 13 project workers and 2 outside staff
- Discussed research aims & methods
- Information on overdose experience, attitudes & care processes was volunteered



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# *Results*

## *Literature overview*

- 783 references identified from electronic data bases
- 32 references identified from references
- 815 references screened
- 78 papers read
- 39 studies included
- Interventions described:
  - Treatment at scene of overdose
  - Treatment to prevent overdose
  - Improved access to prevention and treatment

## *Treatment at scene*

### 1) Take home naloxone (18/39 papers)

- 12 papers reported intervention; 6 papers reported attitudes
- Injecting drug users trained to administer naloxone to peers if they witness an overdose
- Delivered by health care workers, drug treatment centres, needle exchange projects
- Users received minijets/ready-filled syringes – sometimes also needles, masks, other information



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- No reported misuse
- Users reported increased confidence in responding to an overdose
- Heroin users significantly more willing to treat an overdose
- Health care workers and physicians often unwilling to prescribe naloxone



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## 2) Other peer assistance (1/39 paper)

- CPR training to bystanders at a poisoning
- CPR category includes clearing airway and giving mouth-to-mouth ventilation
- Mostly carried out by friends

## 3) Professional Naloxone administration (7/39 papers)

- Intranasal, intravenous, subcutaneous, intramuscular
- Delivered by health professionals in emergency setting eg. paramedic, health worker
- Two studies recorded whether treated patients refused transport to hospital, against paramedic advice

# *Prevention treatment*

## 1) Sustained release Naloxone (4/39 papers)

- Subcutaneous implant or oral (tablet)
- Delivered by health professionals in emergency setting or to a referred patient who had experienced an overdose
- Sustained Naloxone release monitoring therapeutic blood levels for extended periods

# *Improved access to treatment & prevention*

## 1) Police attendance protocols (3/39 papers)

- Aim to encourage users who witness an o/d to call 999
- Protocols agreed between police, ambulance, hospital A&E, coroners, drug agencies, policy makers, users
- Limits police attendance at 999 calls except when ambulance crews are considered at risk
- Part of multiple interventions including education, information and administration of naloxone
- Unclear if encouraged users to call 999

## 2) Supervised injection facilities (3/39 papers)

- Protocols for responding to suspected overdose
- Professional attendance in the event of an overdose
- Safe injecting environment with referral to treatment and other healthcare
- Preferred by users over illegal venues as a safer using environment
- Nightclub with protocol for club medics to identify overdose risk factors

## 3) Psychosocial/education interventions (3/39 papers)

- Aimed at enabling users to recognise o/d triggers & symptoms to avoid and prevent poisoning
- Psychotherapy, counselling, social advice, job guidance
- Awareness of overdose risk factors, first aid, calling 999
- Often included within other interventions

# *Systematic Review*

- 15 studies reported effectiveness results and included in the systematic review
- 11/15 studies published 2005-08
- Quality assessment possible on 12/15
- 3 studies did not report comparable data
- 1 good RCT and 2 good non-randomised trials
- Mostly poor quality/uncontrolled studies

## Estimate of effectiveness limited by:

- Variety of populations, interventions, methods and outcome measures
- Poor quality overall
- Lack of comparable outcomes

Studies grouped according to method and outcome measure to identify potential for combination

10/15 papers had at least one comparative result

- 1) **Take home naloxone (THN) may reduce heroin poisoning deaths**
  - One study reported heroin deaths dropped significantly from 466 to 324 ( $p < 0.001$  chi-squared test; OR 1.44, 95% CI for OR 1.25, 1.66).
- 2) **Mortality appears to be reduced by complex interventions**
  - Significant reduction in death rates after intervention (police protocol + education + paramedic-administered naloxone) ( $p = 0.036$ ).

### 3) Naloxone implants appear to reduce mortality

- 2 papers reported lower poisoning rates but results not significant and OR low

### 4) (Almost) any treatment programme lowers mortality risk

- Risk increases after leaving treatment
- Results in restricted 'treatment leavers' sample cannot be extrapolated to general population

## 5) Bystander CPR may reduce need to hospitalise non fatal poisoning cases

- Significantly better recovery following resuscitation by paramedics for cases administered bystander CPR before paramedic arrival

## 6) Intramuscular and intranasal naloxone are both effective

- IN may be slower than IM
- IM at least as good as intravenous administration

## 7) Training and information accompanying THN increases acceptability to administer it

- After training, proportion willing to administer THN :
  - rose from 77% to 99%
  - rather than call 999 rose from 35% to 62% (OR 3.04;  $p < 0.02$  at least)
- Users who experienced or witnessed an overdose more likely to administer THN (OR 3.25  $p = 0.001$ )
- THN acceptable to 62-99% of users but 54% of doctors would not prescribe it



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## *Meta analysis*

- No studies were similar enough in outcomes or treatments to combine results



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# *Study limitations*

- Papers published in English since 1998
- No comprehensive means of searching grey literature

# *Implications*

- Little evidence of effectiveness for interventions identified in this review – but little evidence of harm either
- Evidence mainly relates to THN through drugs agencies and not through other channels
- THN is being piloted in Wales – opportunity for rigorous evaluation to include
  - Cost and cost effectiveness of a take home scheme
  - Clinical effectiveness in preventing poisonings
  - Adverse event rates & the nature of any adverse events (eg. life threatening)
  - Effects on drug taking behaviour



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Full study report available from  
[www.awardresearch.org.uk](http://www.awardresearch.org.uk)

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