Outbreak of wound botulism among people who inject drugs, Scotland, Dec 14 – May 15

Dr Gillian Penrice, consultant public health medicine, NHS Greater Glasgow and Clyde
Context

• Bacterial infections major problem in PWID
  – Abscess, sore or open wound
  – Severe illnesses
  – Hospital admissions

• Previous outbreaks in PWID in Scotland
  – C novyi, 60 cases (2000)
  – Anthrax, 119 cases (2009)
Background

• *C. botulinum*
  – Worldwide distribution
  – *Clostridium* spores found in soil

• Toxin potentially fatal paralytic illness
  – Difficulty swallowing, slurred speech, dry mouth
  – Double vision, blurred vision, ptosis
  – Descending paralysis

• Infant, foodborne and wound botulism
Number of annual cases of wound botulism in the UK (2000-2014) (confirmed and probable)

Outbreak detection
- 24th Dec 2014 - 38 yr old female from Glasgow presenting with dysphagia
- 1st January 2015 - 34 year old male from Glasgow presenting with symptoms of botulism.
Where does heroin come from?

1. Opium

2. The great Afghan bake off

3. Pressing

4. Bash

5. Street ready
Local Multidisciplinary Incident Management Team

Objectives

1. To prevent further exposure among those at risk.
2. To reduce morbidity and mortality in those affected.
3. Ensure appropriate clinical management of cases (medical and addiction needs)
4. Communicate with the public and other relevant agencies.
Police investigation
Information sharing between NHS and Police Scotland

Operation Bilafond
Contaminated Heroin

There have been a number of cases where people have contracted Botulism after using contaminated heroin. Drug use can pose a serious risk to life; the risk is heightened if the substance is contaminated.

The focus of Police Scotland is keeping People Safe. We want to reduce the risk to you and others by tracing the source and removing it from circulation.

Police Officers may visit you to obtain any information you may have to help us achieve this. Our focus and priority is to use any information provided for the purpose of protecting public health by locating and removing the source of contaminated heroin from our communities.

If you have any information please contact Police Scotland on 101, or in an emergency dial 999. You can also call Crimestoppers in confidence on 0800 555 111.

If you want to get help or find out more information about substance misuse then get the facts at www.scotland.police.uk or www知theMore.info

March 2016

HPS notified of a possible case by CPHM/PHE

HPS pass non-identifying information about case to Police Scotland

Police Scotland approach NHS Board for further information about case

NHS Board decide whether or not to share patient identifiers with Police Scotland
Outbreak results

• From end Dec 2014 to June 2015
• 40 in Scotland (GGC, Lanarkshire, A&A, FV, Fife)
  – 17 confirmed, 23 probable (2/3 were male)
• 25 of the total Glasgow residents
  – 9 confirmed, 16 probable
  – Age range 24 – 56 yrs (mean 41 yrs)
  – 18 males and 7 females
• Majority well known to drug services
• All presented with typical symptoms – but not all were recognised and diagnosed immediately
• All received antitoxin and antibiotics (+/- surgery)
• 4 deaths (botulism contributing to 2)
Cases of wound botulism in Scotland
December 2014 to June 2015

Date of Hospital Admission (week commencing)

Number of Cases

Probable
Confirmed
All report using heroin obtained either in, or soured, via Glasgow
Drugs used (n=35)
- All used heroin
- 13 (34%) also took methadone
- 6 (16%) also used other illegal drugs

Route of drug use (n=32)

- Intravenous: 10
- Smoke &/or snort: 8
- Skin &/or muscle popping: 6
Risk Management

Control options are limited

• Preventing exposure - “high risk” heroin indistinguishable from “normal” heroin
  – Pragmatic risk reduction approach

• Eliminate “contaminated” heroin - interruption of heroin supplies
Harm reduction advice

• Avoid muscle-popping or other injecting outside the vein

• Stop using altogether – and get support

• Smoke drugs as an alternative (foil available from needle exchange)

• Seek medical attention if serious inflammation at an injecting site
Risk Communication

Contaminated Heroin Warning

There have been a number of cases where people have contracted botulism after using contaminated heroin.

Botulism can kill if not treated quickly.

If you experience any of these symptoms go to A&E immediately:

- Blurred or double vision
- Slurred speech, difficulty speaking
- Difficulty swallowing
- Difficulty with tongue and lip movements
- Drooping or falling of the upper or lower eyelid
- Extreme weakness
- Possible inflammation at the injection site
- Paralysis that can affect the arms and legs
- Difficulty breathing

Missed hits, muscle or skin popping put you most at risk.

Reduce your risk by:

- Stopping heroin use altogether
- Smoking heroin
- Making sure you hit a vein

For local drug services see: www.scottishdrugservices.com

Wound Botulism and Drug Use: What Workers Need to Know

Produced by the Scottish Drugs Forum
HUMANS 1ST JUNKIES 2ND

A drug dealer who is on the run said he had been arrested by cops in Rutherford last week.

The Digger reported that officers from the Major Investigation Team arrested the man at his home on February 11.

The dealer, 40, from Montrose Street in Rutherglen, has been dealing heroin for a long time.

Recently, she'd been told by a neighbour to try a new heroin dealer as she was 'brilliant' and they deliver to where you are.

Funny, in the junkie world, nobody ever says their stuff is bad - even if it kills you. Which is what this story is about.

The neighbour gave the number. She told me this in the canteen in the Royal Infirmary last week. Her memory, she said, was not good. The hole in her neck where staff cut open a pathway for a tube so she could breathe stared at me as I drank my tea. She was wearing her pyjamas as we walked along the maze of corridors. The first hospital she went to was on the Friday 23 January last month.

I say the first as she passed through three accidents and emergency doors before medic could diagnose her condition. She told me first there are humans then there are junkies. Humans first junkies second.

The new dealer was called Nico and he is black. Both of themselves called the hotel where they are staying to see if there are more heroin dealers available for hire.

Both said he was a black partner for the gang and they think he is African. A sort of carrot colour she said but it hadn't added it yet as it was dark in her vein. But the when she met second time, on the Friday, she said it was dark.

There were three in the car. There were four in the car and it went into a wall. Nico was in the car when she went into the wall. She out with nothing. She didn't know then score two £10 bags of heroin that the meter was with and was crack cocaine. That was the previous week and the first time away. On the Wednesday morning after a week it was a rough sleep she made up. She had a slight sore head. Her throat was also dry. And if you, reader, take home on Barnflat Road, in the street. Yes it was very dark. But doesn't have long to live.

MEDICAL CENTRE AND HOSPITALS FAIL TO SPOT KILLER INFECTION
Conclusions and questions

• Largest outbreak of botulism among PWID to date – potential for more cases to arise

• Postcards have increased awareness of signs and symptoms. Impact on risk reduction to be evaluated.

• Source remains unconfirmed though likely associated with contaminated heroin, or cutting agent

• Why just Scotland?

• Cases in Norway around the same time – coincidence?
Thank you
Any questions?
Karen Dunleavy
University of The West of Scotland

Norah Palmateer
Health Protection Scotland
Guidelines for the public health management of tetanus, botulism or anthrax among people who use drugs

Norah Palmateer and Karen Dunleavy

26th April 2016
Presentation overview

• Background
• Rationale, TOR and intended users
• Guideline development process
• The Guidelines (draft)
  – Initial response
  – Epidemiological investigation
  – Microbiological investigation
  – Recommended public health interventions
• Tetanus, botulism and anthrax
  – Caused by spore-forming bacteria (SFB)
• Spores are widely found in the environment

• Likely sources of spores
  – Drugs
  – Cutting agents
Background

Increase in SFB infections among PWUD in the UK since 2000

Number of cases

Botulism  Tetanus  C. novyi  Anthrax
Higher rates of infection seen in Scotland

Source: Palmateer et al., *Emerging Infectious Diseases*, 2013
Rationale for the Guidelines

• Due to the widespread occurrence of these spores, contamination is considered to be ongoing
  – Potential for further outbreaks of SFB among people who use drugs (PWUD)*

• From previous outbreaks in Scotland, much experiential learning has been gained

[*Note: the majority of SFB infections have been among people who *inject* drugs (PWID); however, anthrax can potentially be acquired via smoking/snorting drugs, therefore Guidelines refer to PWUD]
Guidelines Development Group
Terms of Reference

Remit

To develop guidance for the public health management of incidents/outbreaks involving the contamination of illegal drugs with SFB (Clostridium tetani, Clostridium botulinum and Bacillus anthracis*), taking onboard the lessons learned and recommendations from previous outbreaks.

In scope

- Operational aspects for managing incidents
- Public health interventions to prevent or limit the impact on health from infection with spore forming bacteria

Out of Scope

- The clinical management of cases

*although the principles can be applied to incidents/outbreaks associated with other SFB, such as C.sordellii, C.novyi, etc.
Target audience/users

Those involved in the management of incidents involving the contamination of illegal drugs with SFB including:

- Front-line hospital staff, addiction staff, IEP staff
- Primary Care staff
- Consultants in Public Health Medicine
- Consultants in Microbiology
- Consultants in Health Protection Scotland
- Police Scotland
- Criminal Justice Service
- Specialist Drug Services
- Third sector agencies providing services for PWUD
HPN/HPS Guidance Development Framework

• Stage 1 – Topic Selection and Scope
• Stage 2 – Formation of the Guideline Development Group (GDG)
• Stage 3 - Identification and Evaluation of Evidence
• Stage 4 – Formulation of Recommendations
• Stage 5 – Editing, Publishing and Implementing
Stage 3 – Key Questions

• Operational
  – Initial Response
  – Responsibility for Leading Investigations
  – Formation of IMT
  – Epidemiological Investigation
  – Microbiological Investigation
  – Communications

• Scientific
  – Public Health Interventions
Stage 3 – Overall Search Strategy

• Publications from key agencies
  – HPN, Scottish Government, PHE, NICE etc
    • Guidelines/Operational Documentation

• Scientific literature search - primary research
  – Search strategy
Scientific Literature – Search Strategy

• How to search? PICO
  – Population/(Problem)
  – Interventions
  – Comparisons
  – Outcomes

⇒ Search Terms
Scientific Literature - Search Strategy

• Where to search?
  – Bibliographic databases
    • MEDLINE, EmBase, Cinahl, PsychInfo
  – Reference Checking/Citation checking
  – GDG members suggestions
  – Grey literature

• When searched?
  – Oct to Nov 2013, Catch up

• What to include?
  – Inclusion/Exclusion Criteria
Scientific Literature - Screening

PUBLIC HEALTH INTERVENTIONS

537/482 Documents

FIRST SCREEN

31 Documents

SECOND SCREEN

8 Documents

ADVICE & GUIDANCE COMMUNICATION METHODS

588/471 Documents

FIRST SCREEN

14 Documents

SECOND SCREEN

2 Documents
Scientific Literature - Appraisal

• Quality Assessment (Methodology)
  – Scientific literature: SIGN/NICE checklists – 2 GDG reviewers
  – Guideline: AGREE II - 4 GDG reviewers

• Considered Judgement
  – Quantity, quality, consistency of evidence
  – Applicability to NHS Scotland
  – Generalisability to SFB/Outbreaks
  – etc
Conclusion
Scientific Literature

• Insufficient evidence on preventive PH interventions
  – specific to SFB among PWUD
  – specific to outbreaks/incidents among PWUD

• Recommendations re PH interventions
  – Routine (standard practice)
  – Enhanced (specific to SFB/outbreaks)
    • EXPERT OPINION/BEST PRACTICE/EXPERIENCE
The Guidelines (draft)....
Initial response

- Statutory notification
  - Suspected cases should be notified to local health protection team (HPT), who in turn notify Health Protection Scotland (HPS)

- Initial diagnosis is clinical

- HPTs should ensure that:
  - Appropriate specimens are obtained
  - Enhanced surveillance forms completed
  - Local awareness-raising with clinicians/frontline workers on signs/symptoms to ensure prompt detection of further cases
## Responsibility for leading investigation

<table>
<thead>
<tr>
<th>Management</th>
<th>Resources</th>
<th>Briefing</th>
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<tbody>
<tr>
<td><strong>Sporadic case</strong> <em>(a single case which is more than six weeks since the last case in the same geographical area and no increase in cases or a cluster in neighbouring countries)</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tetanus or Botulism</td>
<td>NHS Board-led PAG. Investigation managed locally</td>
<td>Local HP team</td>
</tr>
<tr>
<td>Anthrax</td>
<td>NHS Board-led PAG. Investigation managed locally</td>
<td>Local HP team</td>
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</table>

| **Two sporadic cases** *(two cases in more than one NHS Board area which occur within six weeks of each other)* | | |
| Tetanus, Botulism or Anthrax | NHS-led IMT with links to other NHS Boards as required. Investigation managed locally | Local HP team | HPS re Scottish alert, DPH in NHS board, SGHD according to protocol, Consider briefing Police Service of Scotland, HPA re UK and Euro alert |

| **Cluster of two cases** *(in one NHS Board) or three or more cases (in more than one NHS Board area) which occur within six weeks of each other* | | |
| Tetanus, Botulism, Anthrax ¹ | NHS-led IMT with links to other NHS Boards as required (Across several boards agree IMT lead - HPS or NHS Board). Investigation of cases managed locally | Local HP team | HPS re Scottish alert, DPH in NHS board, SGHD according to protocol, Consider briefing Police Service of Scotland, HPA re UK and Euro alert |
Investigation of two or more cases best managed by activating an IMT, normally including:

- The Chair – usually the NHS board CPHM (for local investigations). Investigations involving several NHS Boards may be HPS-led;
- Leads from other NHS boards (if required);
- NHS board(s) Addiction/IEP service leads;
- Communications lead (NHS board and/or HPS);
- Local microbiology lead;
- HPS lead and epidemiologist;
- Representatives from Scottish Drugs Forum and Police Scotland;
- COPFS representative (if required).
Scottish Drugs Forum
- Provide expertise on drugs and patterns of drug use
- Represent service users
- Utilise communication networks to disseminate public health alerts
- Develop training/resources for frontline staff
- Develop awareness-raising materials for those at risk

Injecting Equipment Providers
- Cascade information to frontline staff
- Disseminate awareness-raising materials to/facilitate discussions with those at risk
- Create referral pathways from IEP to medical care
### Epidemiological investigation

- **Case definitions (adapted from ECDC):**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Probable</th>
<th>Confirmed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinical</strong> evidence compatible with infection</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Epidemiological</strong> Use of illicit drugs by any route within the 2 weeks prior to onset of symptom</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td><strong>Microbiological</strong> Usually isolation of organism and/or detection of toxin</td>
<td>✓</td>
<td>✓</td>
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</tbody>
</table>
Epidemiological investigation

- Enhanced surveillance questionnaires should be completed and returned to HPS
- Interview/questionnaire should be completed by frontline drug/addictions staff
Microbiological investigation

• Signposting to other existing resources (PHE, HPS)

• Timeliness of collection of clinical samples is important
  – i.e. before administration of antitoxin or antibiotics (but do not delay treatment to wait for laboratory result)
Recommended public health interventions

- Categorised as ‘routine’ or ‘enhanced’
- Routine interventions are those that should be standard practice
- Enhanced interventions are those that are specifically recommended for an incident/outbreak of SFB
  - Usually based on GDG expert opinion
Recommended public health interventions - hierarchy

- Encourage PWUD to reduce/eliminate drug use;
- Encourage PWUD to switch to a safer route of drug use (where appropriate);
- Reduce the harm among those who continue to inject drugs
  - Pre-exposure prophylaxis (tetanus only)
  - Post-exposure prophylaxis (tetanus only)
  - Provision of injecting equipment
  - Advice on safer injecting behaviour;
- Education and awareness-raising of the signs and symptoms of illness
• Encourage PWUD to reduce/eliminate drug use

<table>
<thead>
<tr>
<th>Recommended intervention</th>
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<tbody>
<tr>
<td>Services providing OST should be reviewed and enhanced (where necessary) in order to</td>
<td>Enhanced</td>
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<tr>
<td>maximise coverage</td>
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Rationale: It may be possible to reduce or remove waiting lists and/or review eligibility criteria for receiving or remaining on OST to ensure that OST is maximised during an incident/outbreak period
- Encourage PWUD to switch to a safer route of drug use (where appropriate)

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<th>Recommended intervention</th>
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<tr>
<td>Advice and information encouraging people to switch to a non-injecting route of drug</td>
<td>Enhanced</td>
</tr>
<tr>
<td>consumption should be considered (where there is no intelligence to suggest that drugs are co-contaminated with anthrax spores)</td>
<td></td>
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</tbody>
</table>

Rationale: Smoking (or other non-injecting routes of consumption) poses a lower risk of infection (except in the case of anthrax) than injecting, since injecting: (i) introduces infectious agents directly into the bloodstream, and (ii) skin/soft tissue damage as a consequence of injecting provides an appropriate environment for the germination of anaerobic SFB.
Recommended public health interventions

• Reduce the harm among those who continue to inject drugs

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<tr>
<td>Within the context of an outbreak of tetanus, low-threshold services should be enhanced and every opportunity should be taken to ensure that those with no or incomplete immunisation status are identified and vaccinated</td>
<td>Enhanced</td>
</tr>
</tbody>
</table>

Rationale: Acknowledging that the provision of the vaccine through a five dose schedule will not achieve effective immunity during the timeframe of an outbreak, a pragmatic approach is nevertheless to offer a booster dose to all those whose vaccination status is unknown or incomplete.
Recommended public health interventions

- Reduce the harm among those who continue to inject drugs

<table>
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<tr>
<td>PWUD should be encouraged to minimise the use of acidifier for mixing with drugs</td>
<td>Routine</td>
</tr>
<tr>
<td>PWUD should be encouraged to wash their hands before preparing drugs</td>
<td>Routine</td>
</tr>
<tr>
<td>PWUD should be discouraged from injecting intramuscularly or subcutaneously (whether intentional or accidental)</td>
<td>Routine</td>
</tr>
</tbody>
</table>

Rationale: Too much acidifier or injecting into the skin/muscle can cause local tissue damage, which can result in the creation of anaerobic conditions that promote spore germination. Good injecting hygiene may help to minimise the level of the more common staphylococcal skin and soft tissue infections that may confuse the early diagnosis of illness caused by SFB
Recommended public health interventions

- Education and awareness-raising of the signs and symptoms of illness – among PWUD

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<tr>
<td>Information on the signs and symptoms of illness, and guidance on when and where to seek medical care, should be communicated to users</td>
<td>Enhanced</td>
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Rationale: Users should be informed of the nature of the hazard they face; prompt treatment may improve outcomes.
Recommended public health interventions

- **Education and awareness-raising of the signs and symptoms of illness – among professionals**

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<tr>
<td>IEP and addictions staff should receive training on the clinical presentation of botulism, tetanus and anthrax</td>
<td>Routine</td>
<td>PWUD regularly come into contact with IEP and addictions workers, who may be key to recognising infected individuals and facilitating medical care</td>
</tr>
<tr>
<td>During an incident/outbreak, interventions to heighten and maintain awareness of the clinical presentation of botulism, tetanus and anthrax should be undertaken with IEP and addictions staff</td>
<td>Enhanced</td>
<td>Practical experience of infected individuals is limited due to these infections being rare, thus it is important to refresh training during incidents/outbreaks</td>
</tr>
<tr>
<td>Healthcare professionals should be made aware of the appropriate diagnostic procedures, including the samples to be obtained prior to treatment commencing (although treatment should never be delayed)</td>
<td>Routine</td>
<td>The appropriate sample, collected at the correct time, and/or transported correctly to the laboratory can improve the chances of a microbiological diagnosis confirming infection</td>
</tr>
</tbody>
</table>
• Final sign off by the GDG
• Extended consultation through the Health Protection Network Guideline Development Programme
• Editing & publishing

norah.palmateer@nhs.net
# Acknowledgements - GDG

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
<th>Organisation</th>
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<tbody>
<tr>
<td>Syed Ahmed</td>
<td>GDG member</td>
<td>NHS Greater Glasgow &amp; Clyde</td>
</tr>
<tr>
<td>John Budd</td>
<td>GDG member</td>
<td>NHS Lothian</td>
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<tr>
<td>John Campbell</td>
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<td>NHS Greater Glasgow &amp; Clyde</td>
</tr>
<tr>
<td>Karen Dunleavy</td>
<td>Information officer</td>
<td>HPS/ University of the West of Scotland (UWS)</td>
</tr>
<tr>
<td>Caroline Kelleher/ Anne Weir</td>
<td>Admin support</td>
<td>HPS</td>
</tr>
<tr>
<td>Pat Hicks</td>
<td>Project management</td>
<td>HPS</td>
</tr>
<tr>
<td>John Hood</td>
<td>GDG member</td>
<td>NHS Greater Glasgow &amp; Clyde</td>
</tr>
<tr>
<td>Viv Hope</td>
<td>GDG member</td>
<td>Public Health England</td>
</tr>
<tr>
<td>Carole Hunter</td>
<td>GDG member</td>
<td>NHS Greater Glasgow &amp; Clyde</td>
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<tr>
<td>Dave Liddell</td>
<td>GDG member</td>
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</tr>
<tr>
<td>Norah Palmateer</td>
<td>Scientific lead</td>
<td>HPS/Glasgow Caledonian University</td>
</tr>
<tr>
<td>Alison Potts</td>
<td>Guideline drafting</td>
<td>HPS</td>
</tr>
<tr>
<td>Josephine Pravinkumar</td>
<td>GDG member</td>
<td>NHS Lanarkshire</td>
</tr>
<tr>
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<tr>
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<td>National Services Scotland</td>
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