

Making the care of haemodialysis patients safer

Outcomes of the UK Renal Association Patient Safety Project, 2007-2015

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Introduction and aims

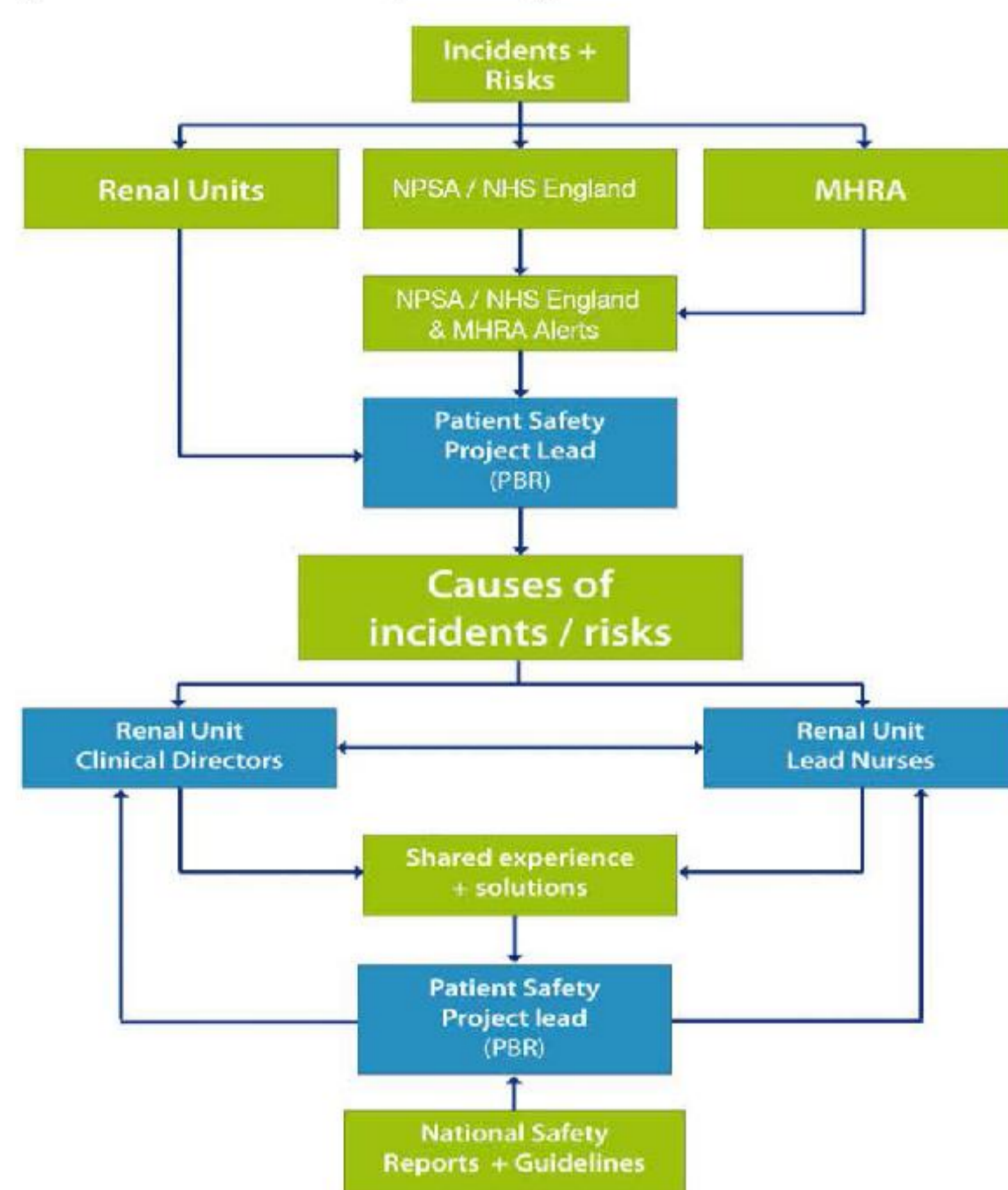
- Patient Safety is a priority for healthcare.
- In the UK 10% of hospitalised patients are exposed to incidents that might cause harm
- Half of incidents are preventable.
- The Renal Association Patient Safety Project was developed in 2007 (ref 1,2)
 - To identify incidents and risks to renal patients
 - To formulate and share solutions.

Methods

A national patient strategy has been developed - (Figure 1)

1. Identification of incidents and risks from 3 sources:
 - a. Reports from renal units (by email to the project lead), National Patient Safety Agency (NPSA), Medicines and Healthcare products Regulatory Agency (MHRA), and NHS England
 - b. Analysis of renal incidents from the National Reporting and Learning System (NRLS), which was developed by the NPSA, and now is managed by NHS England
 - c. Surveys of renal unit clinical directors, lead renal nurses, and renal technologists.
2. The project has been led by a nephrologist, up to now without additional funding.
3. Incidents and risks were analysed by the project lead, circulated to renal units by email, and solutions were shared by email
4. Outcomes have been presented at regional and national meetings, and reported in UK renal and nursing journals
5. The Renal Association (RA) now collaborates with the British Renal Society (BRS) to enhance multi-professional involvement, and a Patient Safety Committee has been convened.
6. A RA/BRS Patient Safety Committee and a patient safety website has been developed.

Figure 1 - Patient Safety Strategy



Results and outcomes

Incidents, risks, alerts and reports

- 101 were circulated to renal units over a 65 month period
- 56% were from equipment failure, (mostly dialysis machines and disposables, including manufacturing and software faults)
- 36% were from technique failure or use error by renal staff.

Incidents of haemolysis associated with:

- Water sterilisation by Hydrogen peroxide, chloramine and chlorine
 - Communication failure with water companies, hospital estates departments or Private Finance Initiatives (PFI) companies and sub-contractors has contributed
- Unassociated with sterilisation, (possibly due to kinking of haemodialysis lines).

Survey of renal unit water plants (Figure 2)

- Inadequacies of water supply design
 - 73% of renal units did not have a water supply direct from the water mains
 - Failure of water plant renewal
 - 47% older than 10 years
 - Lack of consensus on sterilisation protocols
- National water treatment guidelines have resulted from these incidents (ref 3)

Figure 2 - Survey of Renal Unit Water Plants



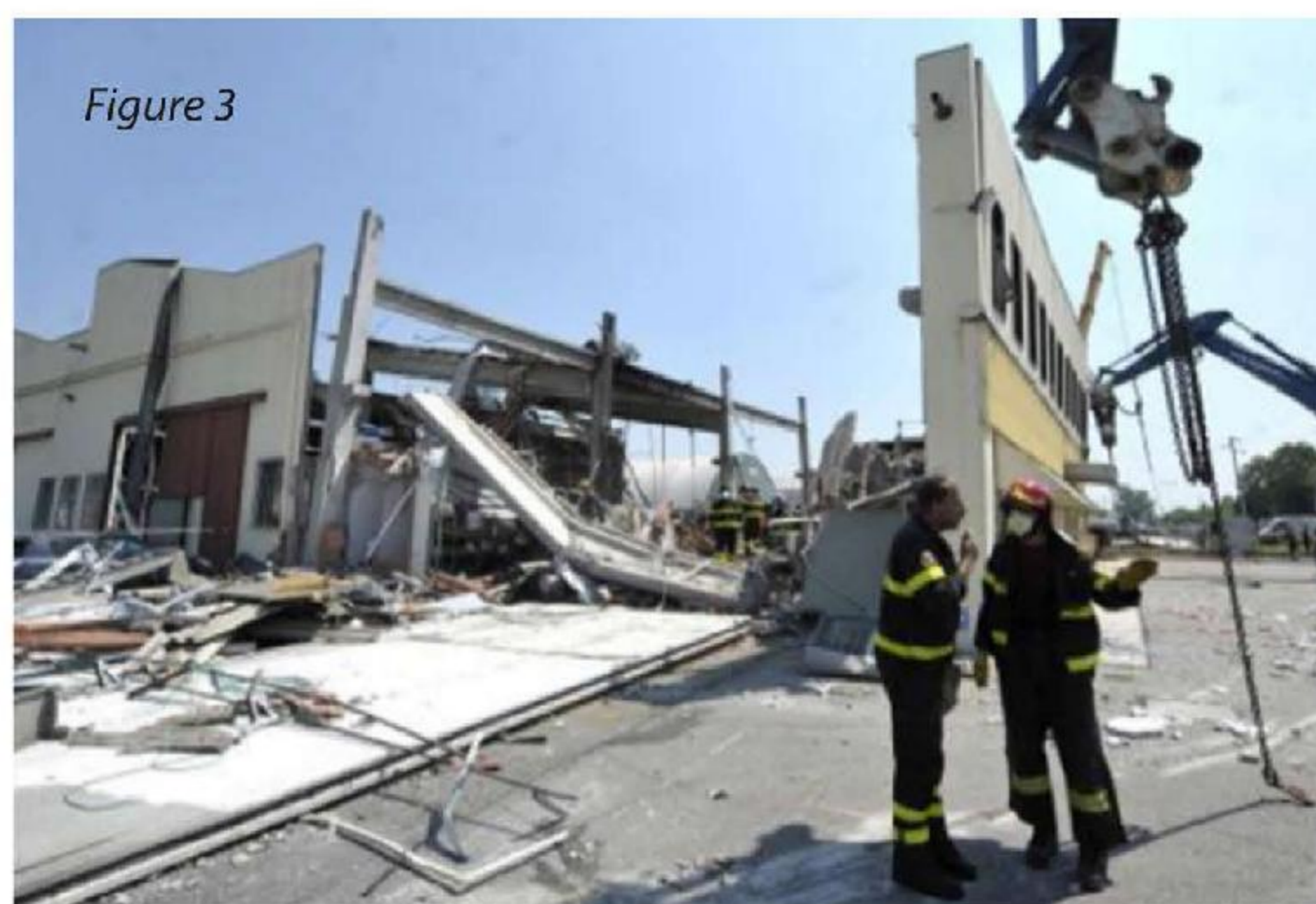
Risks identified by a survey of renal unit lead nurses

- Risks identified related to extracorporeal circuits, vascular access, nurse staffing and a range of other risks.
- Most commonly identified risks were: Venous needle dislodgement, falls, aggression towards staff, reduced dialysis time due to transport needs, low staffing levels, medication errors

Supply failure

- PD fluid and haemofiltration disposables from production problems and factory destruction from earthquake (Figure 3)
- National Supply Resilience guidelines have been developed in conjunction with the Department of Health.

Figure 3



Incidents reported to the NRLS over 12 months (Table 1)

- 94 renal incidents reported resulted in severe harm (n=66) or death (n=28)
- Causes of severe harm/death incidents
 - 40% were due to management failure
 - Mainly delay in receiving medical / nursing care
 - 27% from falls
 - 16% from pressure ulcers

Table 1

Renal incident reports to NRLS resulting in severe harm or death: April 2013 - March 2014

Themes of incidents	Total	Severe harm	Death
Management Failure	38	25	13
Falls	25	20	5
Pressure Ulcers	15	15	0
Infections	7	4	3
Haemorrhage	6	0	6
Venous thromboembolism	1	0	1
Breach of confidentiality	1	1	0
Consent / Mental capacity	1	1	0
TOTAL INCIDENTS	94	66	28
Reports not patient safety incidents	10	1	9

Two additional themes emerged from these analyses:

- Haemorrhage associated with dialysis (Table 2)
- Infection related to fistulae and dialysis catheters
 - Fatal cases of endocarditis have occurred in patients undergoing buttonhole needling.

Table 2

Incidents and risks of haemorrhage associated with haemodialysis reported to the Patient Safety Project

- Venous needle dislodgement
- Femoral dialysis catheters falling out
- Haemorrhage after removal of femoral line
- Cutting of dialysis catheter during removal of a dressing, also associated with air embolism
- Bleeding from untightened dialysis line connection to dialyser, (possibly from change of plastic composition)
- Exsanguination from failure of wash-back procedure
- Haemorrhage from arteriovenous fistulae in the community
- Haemorrhage risk from necrotic areas on arteriovenous fistulae
- Haemorrhage from buttonhole needling

Conclusions

- The Renal Patient Safety Project has shown that risks and incidents are predominantly related to haemodialysis.
- Units should continue to focus on risks for haemorrhage and infection from vascular access.
- There is uncertainty about balancing the risks and benefits of Buttonhole needling, and a workshop has been constituted to review benefits and risks.
- Analysis of incidents has led to creation of national guidelines and strategies.
- Water standards and consensus on monitoring and sterilisation protocols needs reviewing.
- Renal patients are susceptible to failure of general standards of patient care, and prevention of falls and pressure ulcers need to be emphasised.
- Continuing training of renal staff is essential.
- Patient safety is a multi-professional responsibility, and links with the BRS, MHRA and the NHS England and Royal College of Physicians Patient Safety committees have been valuable.
- Renal societies should continue to work with MHRA and dialysis industries to avoid device-related incidents.
- This patient safety strategy could be applicable to other countries and other medical specialties.

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