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Application of Human Factors tools to a clinical incident

Methodology

Understanding the incident

- London protocol
- Data collection via incident management system (Riskman) & Identification Committee
- Simple task analysis in collaboration with local mangers & clinical staff

Methodology

Error analysis

- ABC
- FMEA
- Human HAZOP

Decision making

- Reason's culpability model decision tree
- Hierarchy of controls

Error Analysis – ABC Analysis

Activity	Antecedent	Behavior	Consequence	Positive/ Negative	Immediate /future	Certain/ Uncertain
Delivering medication through IV pump	Example only • Dose on drug chart is illegible • IV pump has guard rails software • Correct medication chosen from pump library	RN enters incorrect dose for medication into pump	Incorrect dose allowable within drug library prescribed range and allowed to proceed Pump library will not allow dose outside of prescribed range process is halted Incorrect dose harms patient	Positive Negative Negative	Immediate Immediate Future	Uncertain Certain Uncertain
	• IV pump has guard rails software • Correct medication chosen from pump library	RN enters the correct dose	The correct dose allowable within drug library prescribed range and allowed to proceed	Positive	Immediate	Certain

Failure Mode Effects Analysis- FMEA

Process Step	Potential Failure Mode	Potential failure effect	SEV	Potential causes	OCC	Current Process controls	DET	RPN	Action Rec.
Entering dose into IV Pump	Incorrect dose entered into pump	-RN has to re-set pump -Pt receives incorrect treatment -significant harm done to pt	10	-Illegible dose on drug chart -IV pump screen not clear IV pump unclear r which channel is being programmed	1	-Drug library software on pump does not allow dose outside of range	3	30	None
	Dose set for incorrect IV line	- RN has to re-set pump -Pt receives incorrect dose of medication with no harm -significant harm done to pt	10	-Pump has two IV lines leading to one physical channel -Unclear when programing which IV line is chosen	1	-Manual checks by RN - labelling of IV bags with additive labels	9	90	-Lines to be labelled with drug from bag to pump

Error Analysis – Human HAZOP

Very structured approach to considering errors

Usually used proactively

Useful structure however did not add value in this review

Decision Making

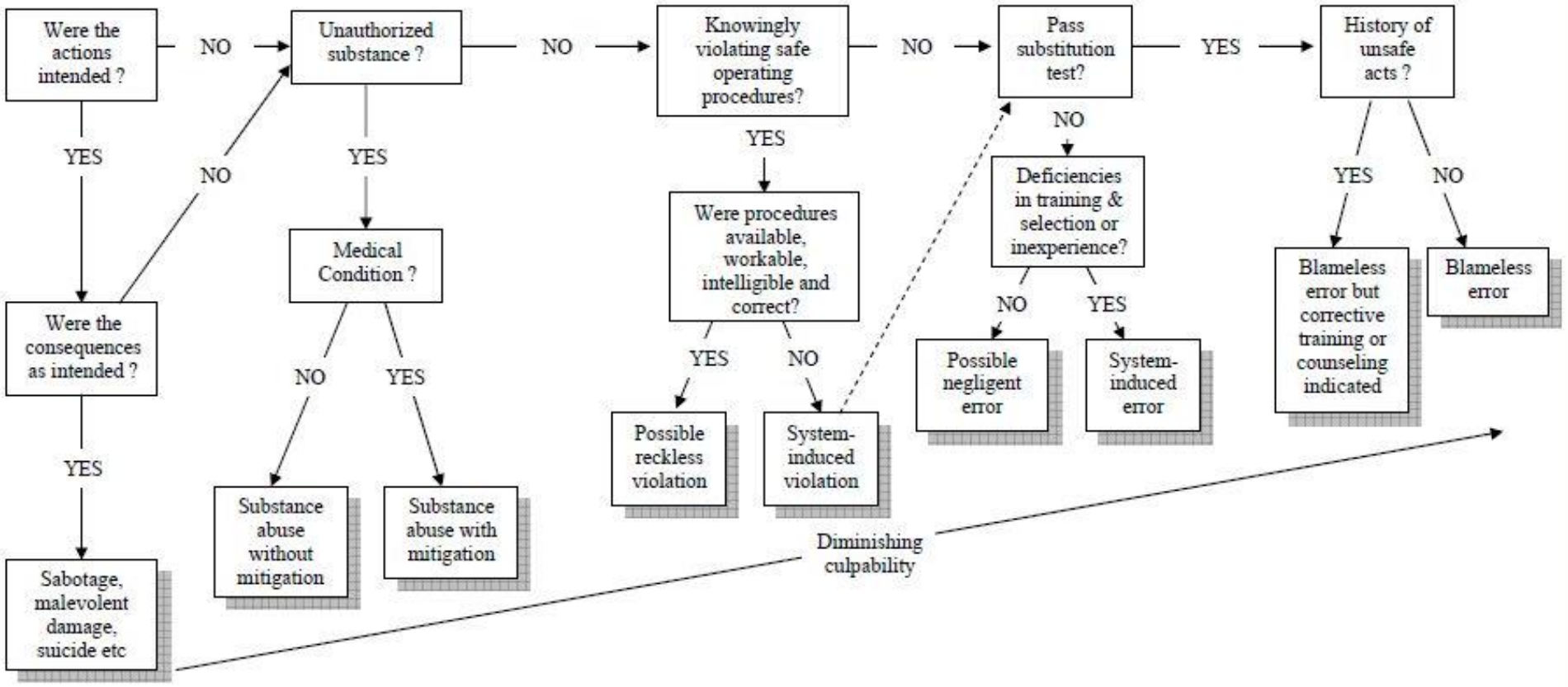

Figure 3. From Reason (1997) A decision tree for determining the culpability of unsafe acts. p209

Summary

- Applying the HF approaches added value
- Application of the tools needs understanding of HF concepts to gain value
- Valuable additions to tool kit for serious incident review

-Culpability model as a tool to illicit further discussion beyond the error itself

-London Protocol as an alternative to RCA methodology for particular types of incident