



# Are AKI Nurses Worth the Investment ?

## A Factorial Design Study

Prasanna Hanumapura, Deryn Waring, Siobhan Halligan, Susan Heatley, Robert Henney, Marc Vincent, Rachael Challiner and Leonard M Ebah

### Various approaches proposed to manage in-hospital AKI



### Methods

- Four different approaches for AKI care were prospectively studied in isolation and in various combinations across different wards
- A 3X2<sup>3</sup> Factorial Design Matrix was implemented across 24 wards (experimental units) by random allocation of intervention(s)
- AKI care processes and outcomes were comparatively analysed before and after the intervention(s) to determine which had the most impact.

### Response Variables

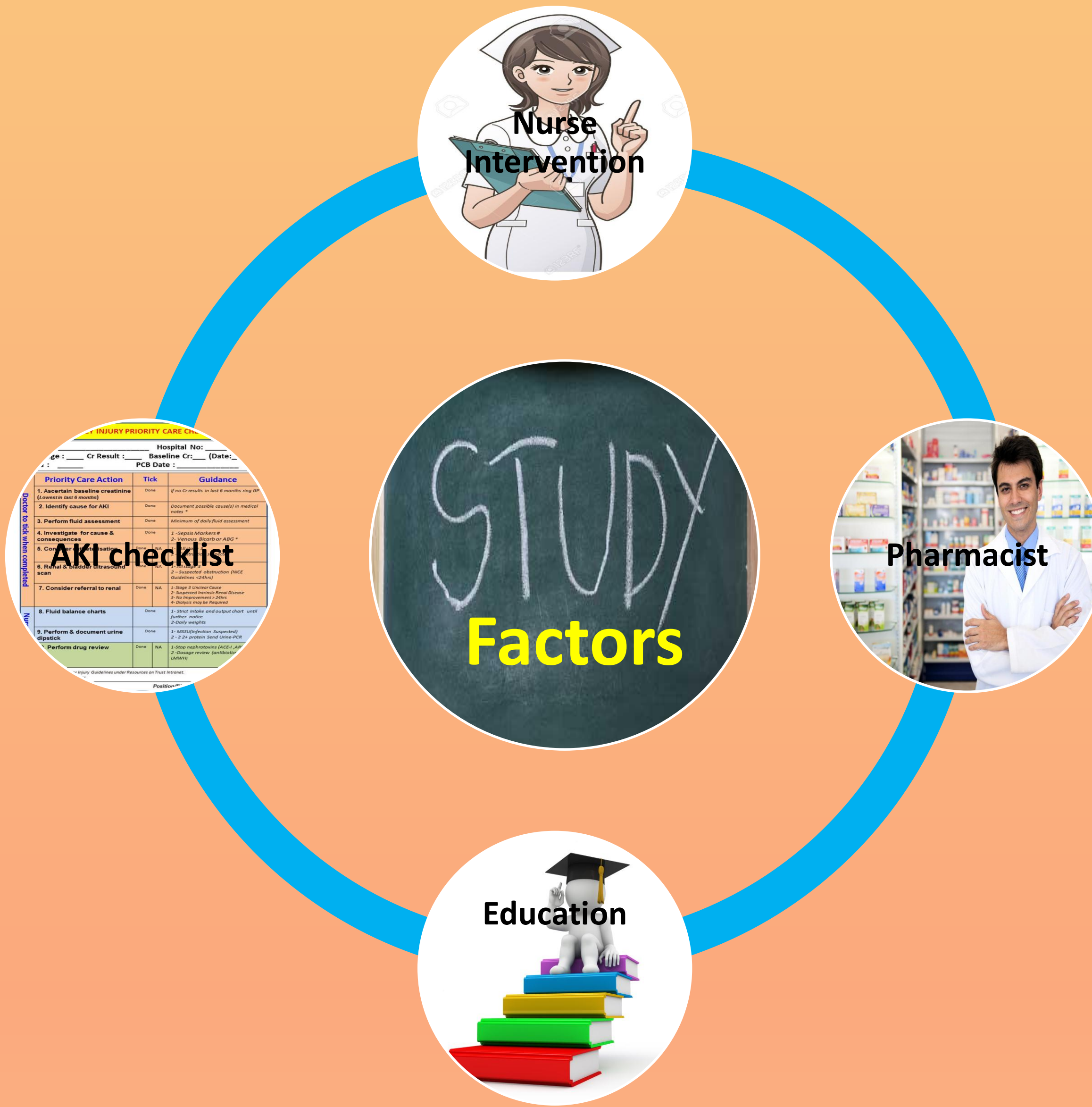
- AKI days or time to recovery (the difference between the date of the first blood test which triggered an AKI alert, to the date the patient is no longer in AKI i.e. Creatinine <50% from baseline)
- Compliance to AKI checklist

## Factorial Design Matrix: 3X2<sup>3</sup>

### Experimental Units

EU No.	Wards	EU No.	Wards
1	AM 1	13	9&10
2	AM 2	14	11& 12
3	AM 3	15	ESTU M&F
4	AM4	16	ETCS
5	AMU MALE	17	CCU/35
6	AMU FEMALE	18	CSITU
7	45 & 46	19	HDU
8	5	20	ITU
9	30, 31 & 32	21	3
10	36	22	4
11	37	23	44
12	7& 8	24	14 & 15

Wards across the hospital divided into 24 units



### Randomization

	Nurse	Pharmacist No		Pharmacist Yes	
		PCB No -	PCB Yes	PCB No -	PCB Yes +
No Education -	No alerting -	5	14& 15	AM2	CCU/35
	Face to face Alerting +	AMU FEMALE	45& 46	ETC S	ESTU M&F
	Telephonic alerting 0	CSITU	AM1	WARD 30.31.32	AMU MALE
Education to clinical Staff +	No alerting -	7&8	4	HDU	3
	Face to face Alerting +	AM4	11&12	37	44
	Telephonic alerting 0	AM3	ITU	9& 10	36

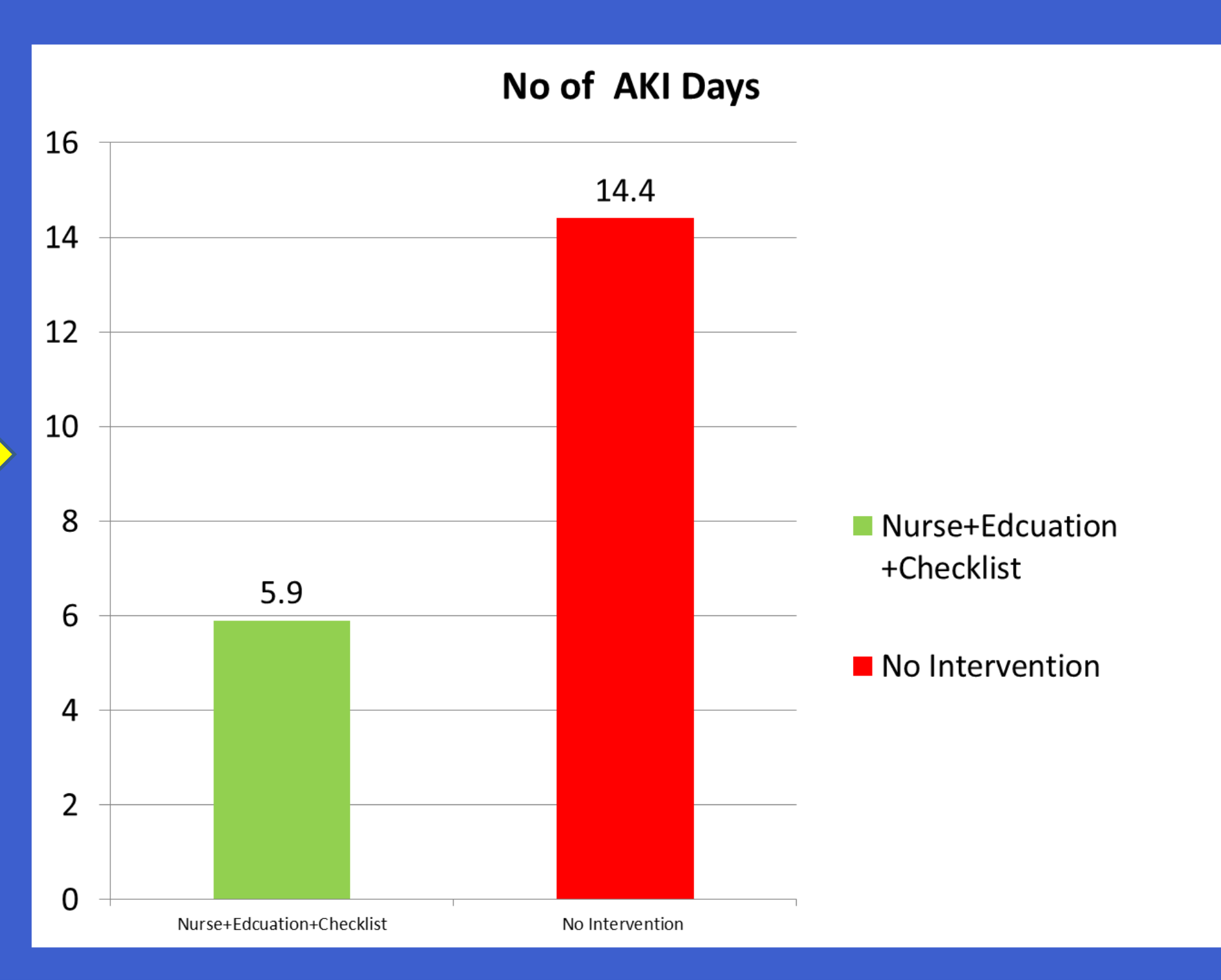
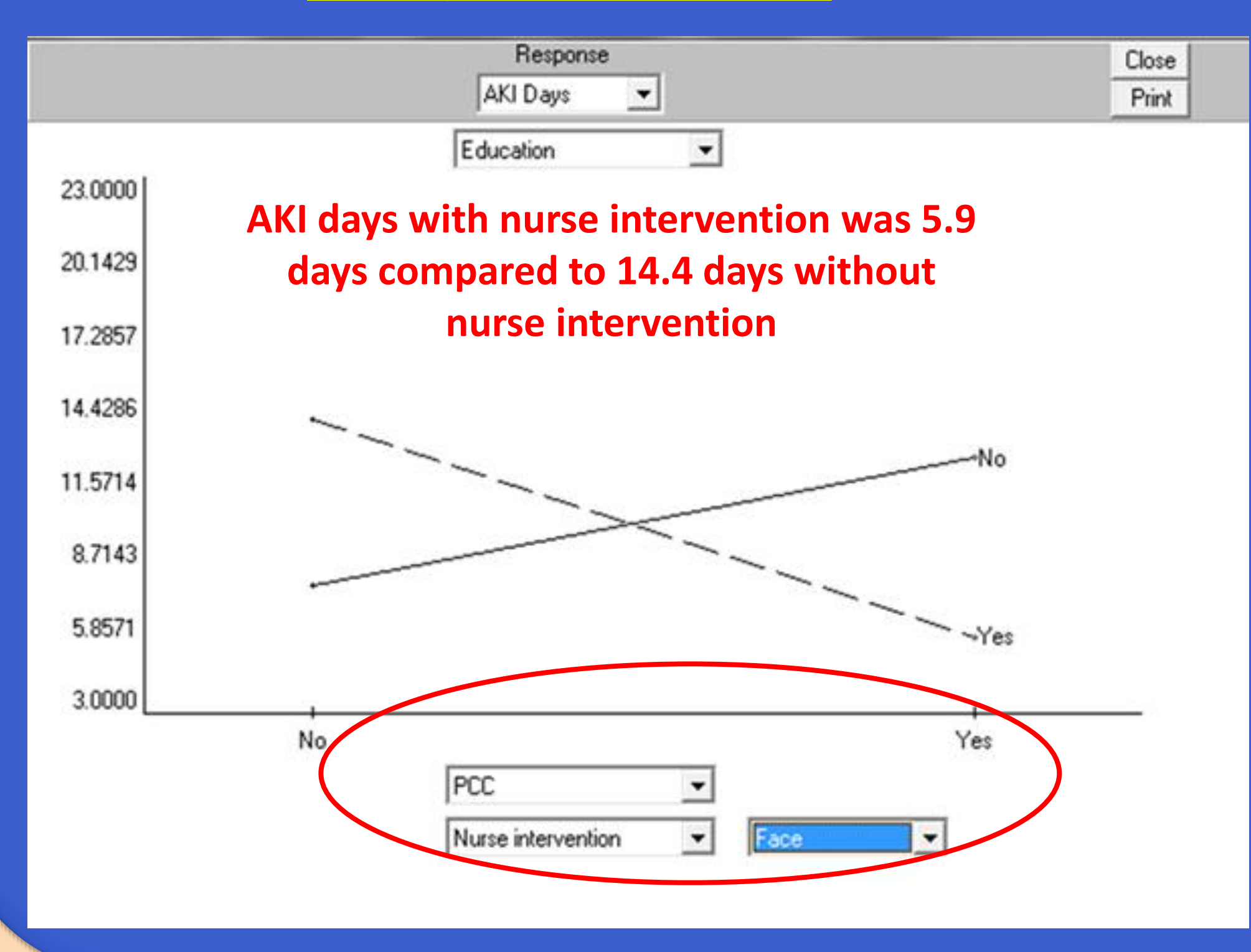
- The table shows:
- Intervention factor allocation for the various experimental units in white (wards)
  - The plus (+) indicates the use and the minus (-) the absence of the intervention
  - E.g. AMU Female had no education, no Pharmacist but did have face to face alerting

### Numbers and Timeframe

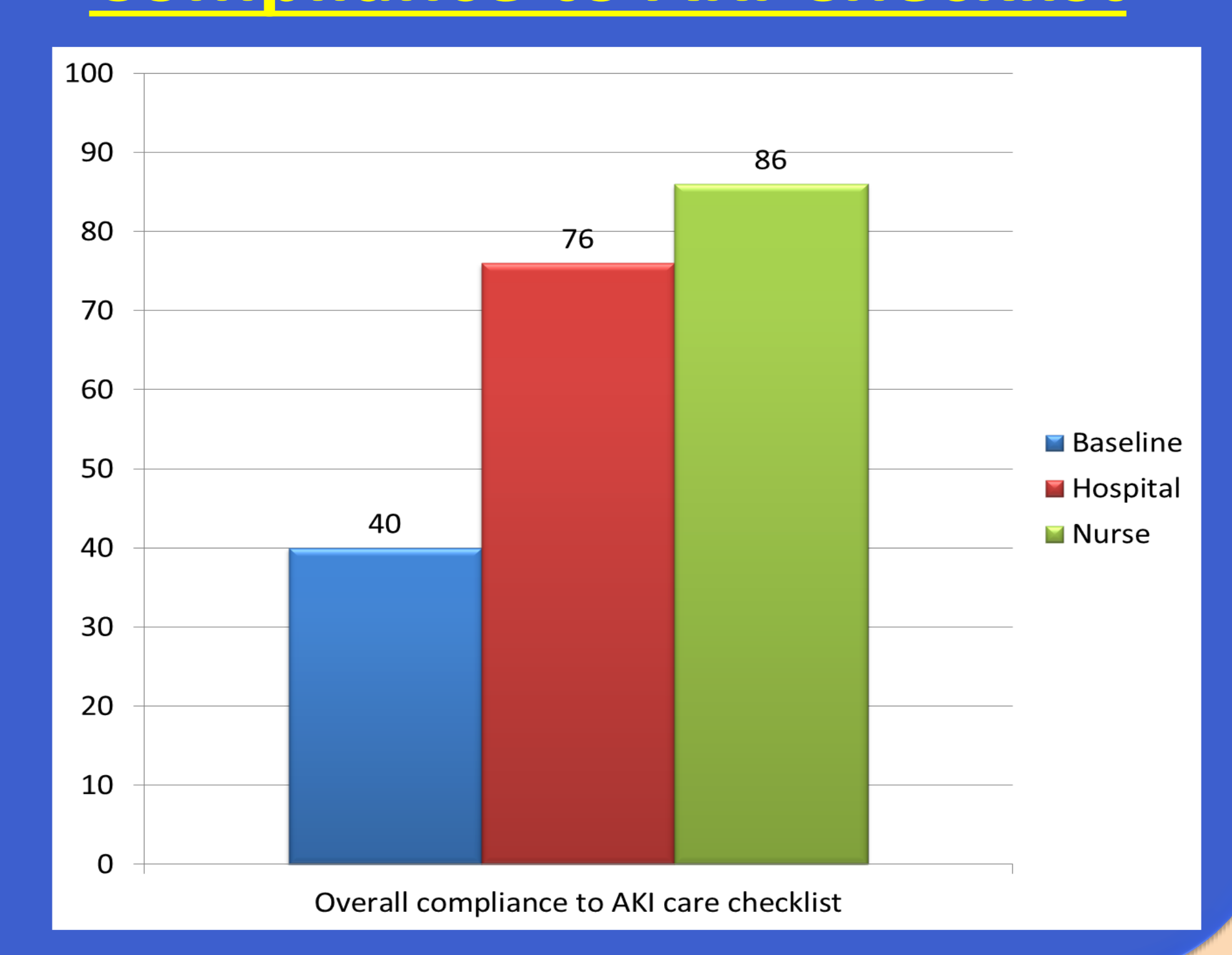
- 133 cases of AKI were subjected to the various combinations of intervention
- Timeline : 8 weeks

## Results

### Response Plot



### Compliance to AKI Checklist



## Conclusion

The factorial design analysis of the intervention has shown that the **Nurse + Education + Checklist** was the most influential combination of factors which had a most significant impact on AKI days . We believe this to be one of the first studies providing clear evidence for use of AKI clinical nurse specialists.

Prasanna.hanumapura@cmft.nhs.uk