Do clinicians anticipate and support non-malignant deaths in hospital?

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Relationships with commercial interests:

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Disclosure of Commercial Support:

NO COMMERCIAL SUPPORT

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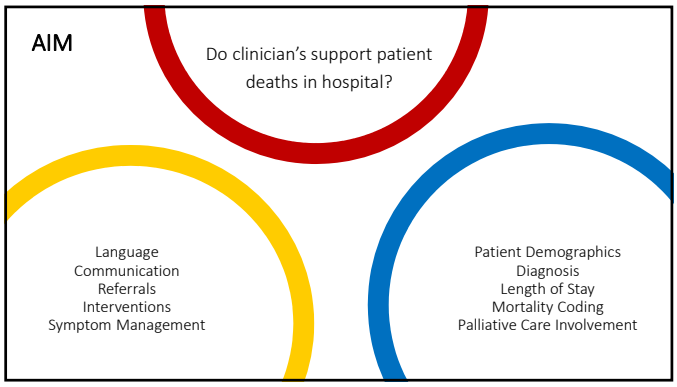
Mitigating Potential Bias:

NOT APPLICABLE

AIM



Mortality Data

Patient Demographics

300 patient deaths

Age: **79**

50:50 M vs F

2/3 saw Palliative Care

Most deaths were **Anticipated**

Most deaths were **Non-Malignant**

	All patients (n=300)
	Count (%)
Age, years	
Median (range)	79 (22-104)
Male	153 (51.0%)
Length of Stay, days	
Mean ± SD	14.3 ± 25.3
Median (range)	8 (1-240)
PC	199 (66.3%)
Mortality Coding	
1-Anticipated death due to terminal illness	166 (56.5%)
2-Expected death, which occurred despite the health service	100 (34.0%)
3-Unexpected death which was not reasonably preventable	26 (8.8%)
4-Preventable death where steps may not have been taken	2 (0.7%)
Missing	6
Cause of Death	
Malignant Death	127 (42.3%)
Non-Malignant Death	173 (57.7%)
Cardiac	46 (15.3%)
Renal	13 (4.3%)
Respiratory	16 (5.3%)
Dementia	29 (9.7%)
Other	69 (23.0%)

Mortality coding by cause of death

Malignant deaths were most likely **coded 1 (Anticipated death)**

Non-Malignant deaths are more likely to be **coded 2, 3 and 4**

Death Cause	Total	1-Anticipated death	2-Expected death	3-Unexpected death	4-Preventable death	p-value
Malignancy	126 (42.9%)	92 (55.4%)	28 (28.0%)	6 (23.1%)	0 (0.0%)	
Cardiac	46 (15.6%)	20 (12.0%)	18 (18.0%)	8 (30.8%)	0 (0.0%)	
Renal	12 (4.1%)	7 (4.2%)	4 (4.0%)	1 (3.8%)	0 (0.0%)	0.0007[2]
Respiratory	15 (5.1%)	4 (2.4%)	8 (8.0%)	3 (11.5%)	0 (0.0%)	
Dementia	29 (9.9%)	15 (9.0%)	13 (13.0%)	1 (3.8%)	0 (0.0%)	
Other	66 (22.4%)	28 (16.9%)	29 (29.0%)	7 (26.9%)	2 (100.0%)	
Total	294	166	100	26	2	

PC involvement by cause of death/mortality coding

Palliative Care is more likely to be referred for a **Malignant death** and for an **Anticipated death (code 1)**

General **50:50** for Non-Malignant deaths except for: **Respiratory & Renal** deaths

	PC Involvement	No PC Involvement	p-value
	Count (%)	Count (%)	
All Deaths	199 (66.3%)	101 (33.7%)	
Malignant	101 (79.5%)	26 (20.5%)	p=0.0001
Nonmalignant			
Cardiac	26 (56.5%)	20 (43.5%)	
Renal	9 (69.2%)	4 (30.8%)	
Respiratory	10 (62.5%)	6 (37.5%)	
Dementia	16 (55.2%)	13 (44.8%)	
Other	37 (53.6%)	32 (46.4%)	
Mortality Coding			p<0.0001
1	132 (75.4%)	34 (24.6%)	
2	55 (55.0%)	45 (45.0%)	
3	6 (23.1%)	20 (76.9%)	
4	0 (0.0%)	2 (100.0%)	

The deeper dive

150 patient deaths

Similar results to the whole cohort

Malignant deaths were at a **younger** age

	Total (N=150)	Nonmalignant Death (N=83)	Malignant Death (N=67)	p-value
Age, Mean ± SD	76.1 ± 13.3	80.5 ± 10.9	70.7 ± 14.0	<.0001[1]
Age, Median (range)	79.5 (22.0-101.0)	82.0 (49.0-101.0)	73.0 (22.0-94.0)	
Length of Stay (Days, Mean ± SD)	14.6 ± 23.4	17.2 ± 29.4	11.4 ± 12.2	0.59[2]
Length of Stay [Days, Median (range)]	8.0 (1.0-206.0)	8.0 (2.0-206.0)	7.0 (1.0-77.0)	
Sex				
Female	63 (42.0%)	35 (42.2%)	28 (41.8%)	0.96[3]
Male	87 (58.0%)	48 (57.8%)	39 (58.2%)	
Language				
English	104 (69.3%)	60 (72.3%)	44 (65.7%)	0.38[3]
Other	46 (30.7%)	23 (27.7%)	23 (34.3%)	
Death Coding				
1-Anticipated death	76 (52.8%)	30 (38.5%)	46 (69.7%)	0.0024[3]
2-Expected death	56 (38.9%)	39 (50.0%)	17 (25.8%)	
3-Unexpected death	11 (7.6%)	8 (10.3%)	3 (4.5%)	
4-Preventable death	1 (0.7%)	1 (1.3%)	0 (0.0%)	
Total	144	78	66	
Cause of Death				
Malignancy	67 (44.7%)	0 (0.0%)	67 (100.0%)	
Cardiac	16 (10.7%)	16 (19.3%)	0 (0.0%)	
Renal	8 (5.3%)	8 (9.6%)	0 (0.0%)	
Respiratory	10 (6.7%)	10 (12.0%)	0 (0.0%)	
Dementia	15 (10.0%)	15 (18.1%)	0 (0.0%)	
Other	34 (22.7%)	34 (41.0%)	0 (0.0%)	

Involvement of Social Work, Spiritual Care and Palliative Care

Malignant deaths are more likely to have both Social Work and Spiritual Care involvement

	Total	Malignant Death	Non-Malignant Death	p-value
	Count (%)	Count (%)	Count (%)	
Involvement of				
Social Work only	29 (19.3%)	8 (11.9%)	21 (25.3%)	0.002
Spiritual Care only	21 (14%)	7 (10.4%)	14 (16.9%)	
Both Social Work and Spiritual Care	44 (29.3%)	30 (44.8%)	14 (16.9%)	
Neither	56 (37.3%)	22 (32.8%)	34 (41.0%)	
Palliative Care Involvement	67 (44.7%)	56 (83.6%)	11 (13.3%)	<.0001

Interventions and Medications @ EOL

Interventions:

- **Blood work**
- **Vital signs**
- **IV Fluids**
- **Artificial Nutrition**

If and when the following were ordered:

- **Anti-emetics**
- **Opioids**
- **Antipsychotics**
- **Anti-cholinergics**

Interventions and Medications @ EOL

Non-Malignant deaths were more likely to have:

- **Blood work** and **Vital signs** done close to death

Non-Malignant deaths were less likely to have:

- An **anti-emetic** ordered

Non-Malignant death were more likely to have the following ordered closer to death:

- An **anti-emetic**
- An **opioid**
- An **anti-cholinergic**

Vital Sign done during admission	67 (100%)	63 (100
Timing of last vital signs measurement (days before death)		
Mean ± SD	1.0 ± 1.5	0.8 ± 1.
Median (range)	1 (0-10)	1 (0-6)
Blood glucose (BG) monitoring during admission	21 (31.3%)	36 (43.4
Timing of last BG monitoring(days before death)		
Mean ± SD	3.1 ± 5.5	2.6 ± 5.
Median (range)	1 (0-25)	1 (0-2
BG monitoring ordered on admission	5 (7.5%)	11 (13.3
Timing of first anti-emetic order (days before death)		
Mean ± SD	1.6 ± 1.7	1.8 ± 4.
Median (range)	2 (0-4)	0 (0-1
Anti-emetic ordered on admission		66 (79.5
Timing of last IV fluids provision (days before death)		
Mean ± SD	1.7 ± 2.2	2.8 ± 7.
Median (range)	1 (0-10)	1 (0-5
Anti-emetic ordered on admission	38 (56.7%)	22 (26.5
Non-oral route order for anti-emetic provided on admission	26 (68.4%)	18 (81.8
Timing of first anti-emetic order (days before death)		
Mean ± SD	8.3 ± 8.8	6.5 ± 17
Median (range)	5.5 (1-38)	3(0-60
Analgesic ordered during admission	60 (89.6%)	70 (84.3

Multivariate Analysis

Factors associated with:

1- blood work done at end of life
2- vital sign measurement at end of life
3- earlier provision of opioid
4- earlier provision of antipsychotics
5- earlier provision of anticholinergics

Age
Male
Length of Stay
PC involvement
Mortality code
- 1-Anticipated
- 2-Expected
- 3,4,5 Others

Death cause, malignancy

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Summary

Clinicians are less likely to anticipate a **Non-Malignant death**

Less likely to refer these patients to **PC**, involve **social work** & **spiritual care**

Earlier EOL care is not associated with either a malignant or nonmalignant death.

Palliative care involvement was associated with both earlier opioid and antipsychotic orders as well as earlier discontinuation of blood work and vital signs.

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