Cycling-related Traumatic Brain Injury 2011

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The Trend of Cycling-related Injury

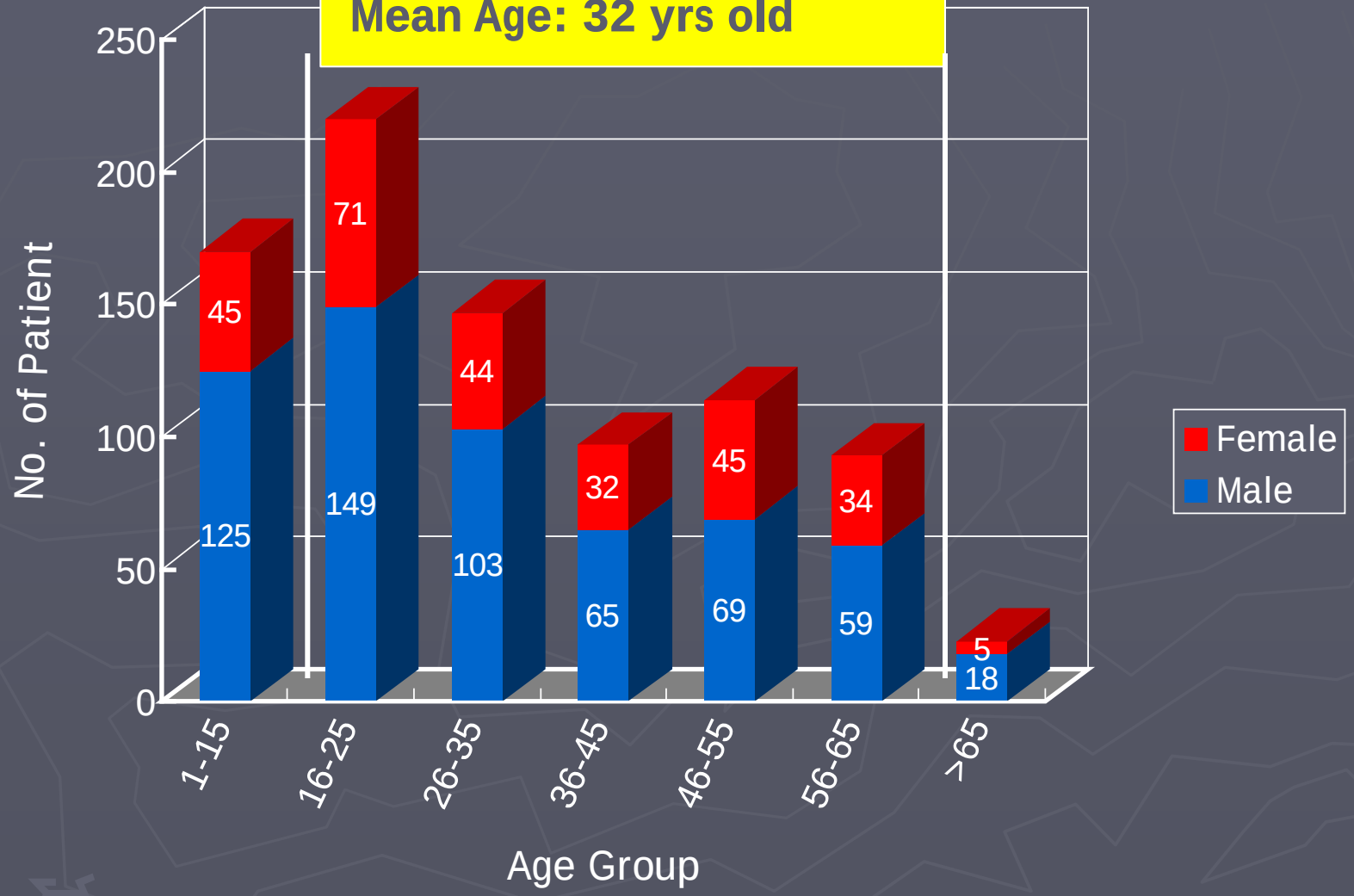
2006
Cycling-related Injury
705

2011
Cycling-related Injury
864

PWH A&E Attendance
⬆ 159 (22.5%)

Age Groups and Sex

771 (89.2%) Working Age
Mean Age: 32 yrs old



Traumatic Brain Injury (TBI)

	TBI	In-patient	Skull Fracture	Intracranial Haemorrhage	Trauma Call	Death
2006	67	56	21	25	8	2
2011	151	63	27	30	11	4
Difference	**84** ↑ **125%**	**7** ↑ **12.5%**	**6** ↑ **28.6%**	**5** ↑ **20%**	**3** ↑ **37.5%**	**2** ↑ **100%**

Only 7 / 151 (4.6%) wear Helmet

Cycling-related Traumatic Brain Injury

Neurological Outcome

Glasgow Outcome Scale (GOS)

1. Dead
2. Vegetative State
3. Severely Disability
4. Moderately Disability
5. Good Recovery

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Glasgow Outcome Scale (GOS)

1. Dead
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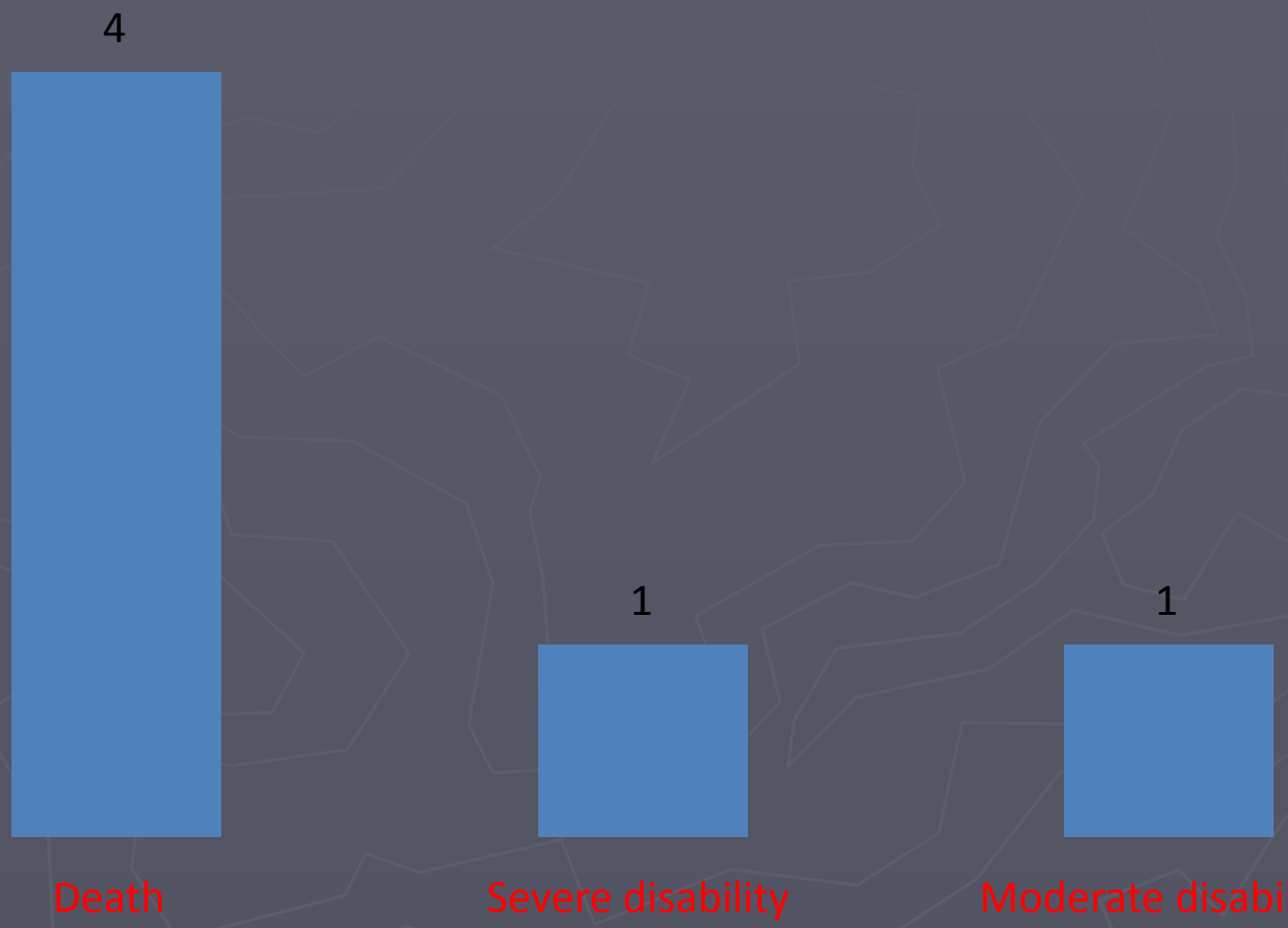
4. Moderately Disability
5. “Good Recovery”

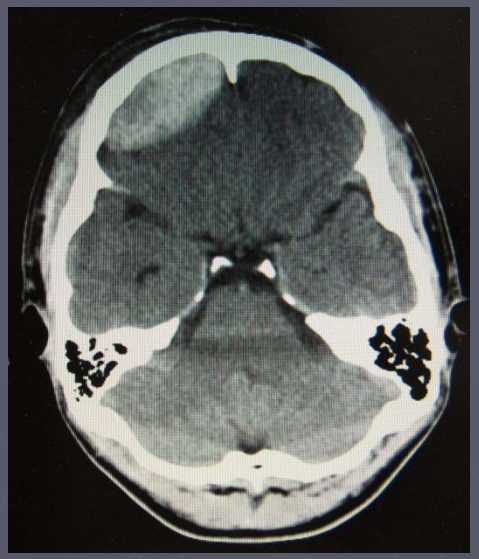
Unfavorable Outcome (2011)



Patient 1

- Elderly cyclist without helmet
- Fell from bicycle and sustained head injury
- On arrival to AED, comatose with dilated left pupil
- CT brain showed subdural hematoma and cerebral contusions
- Emergency craniotomy and hematoma evacuation followed by a second operation to remove the skull bone (craniectomy)
- Hospital stay for 3 months
- Severe disability with cognitive impairment and dysphasia

Patient 2



- Young recreational cyclist without helmet
- Being knocked by another bicycle and thrown out
- Severe headache and nausea on admission
- CT showed extradural hematoma
- Emergency craniotomy for clot evacuation was performed
- Good recovery but with symptoms of persistent dizziness and cognitive dysfunction

Cycling-related Traumatic Brain Injury

Functional Disabilities

Functional Disabilities

40 patients successfully surveyed with “SF-36” questionnaire:

- Physical functioning
- Physical role
- Bodily pain
- General health
- Vitality
- Social functioning
- Emotion
- Mental health

Functional Disabilities

Physical role:

- 22.5% worse than before
- Decreasing working hour
- Getting more difficult to complete the same task

Bodily pain:

- 12.5% reported felt more painful than before

Functional Disabilities

Vitality:

- 17.5% less active and energised in general than before

Social functioning:

- 27.5% decrease frequency of social gathering or family visiting

Mental health:

- 15% felt more anxious or even depressed

Hospital stay and sick leave

Hospital stay:

- ICU: 25 days (6 patients, 1-16 days)
- Neurosurgical ward: 351 days (range: 1-43 days)

Sick leave:

- 1546 days (0-294 days) exempted from work

Helmets for preventing head and facial injuries in bicyclists[1]

- 5 case-control studies (1986-1994: UK, Australia, US)
- 63 to 88% reduction in the risk of head, brain and severe brain injury for all ages of bicyclists
- Injuries to the upper and mid facial areas are reduced 65%

[1]Thompson DC (1999) Helmets for preventing head and facial injuries in bicycling. Cochrane database of systematic reviews

Promoting helmet use in cycling

Non-legislative interventions

- Education campaigns
- Media campaigns
- The distribution of free or subsidized helmets
- Counseling from GPs or emergency clinicians
- Or in combination

- The odds of observed helmet wearing were significantly greater (OR 2.30)[1]

Legislation

- Australia
- Canada
- Czech Republic
- Finland
- Iceland
- New Zealand
- Sweden
- United States
- Spain

- In 2 out of 5 studies (US, Canada), statistically significant decreases in head injuries were reported following the implementation of helmet legislation (all 5 enacted for children only)[2]

[1]Royal S.T. (2005) Non-legislative interventions for the promotion of cycle helmet wearing by children. Cochrane Database of Systematic Reviews
[2]Macpherson A (2007) Bicycle helmet legislation for the uptake of helmet use and the prevention of head injuries, Cochrane Database of Systematic Reviews

Conclusion

- The incidence of Cycling-related Traumatic Brain Injury is on the rise
- Cycling-related Traumatic Brain Injury can have a profound impact and may lead to permanent damage to health
- The prevalence of using helmet is low
- All severe Traumatic Brain Injury patients did not wear a helmet
- We urges widespread helmet use and protective measures against Cycling-related Traumatic Brain Injury