



# Short Term Prediction of Violence

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**NHS**

*National Institute for  
Health and Clinical Excellence*

NICE says.....

- Services should:
  - “consider using an actuarial prediction instrument such as the **BVC** (Brøset Violence Checklist) or the **DASA-IV** (Dynamic Appraisal of Situational Aggression – Inpatient Version)”



**NHS**

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NICE says.....

- Violence and aggression refer to a range of behaviours or actions that can result in harm, hurt or injury to another person, regardless of whether the violence or aggression is physically or verbally expressed, physical harm is sustained or the intention is clear.

# **Bröset Violence Checklist - BVC**

**A tool for predicting imminent violence in mental health care**





# BVC

- “A six item checklist that assists in the prediction of imminent violent behaviour (24 hrs)”
- Violence defined as “physical activity in which a patient’s behaviour directed toward another was perceived to be potentially harmful. Thus in addition to violent incidents in which there had been actual physical contact, incidents such as throwing objects were also included. **Threats that were only verbal were not classified as violent incidents.**”

# DASA IV

- A seven item checklist based upon BVC, own items and clinical scale of HCR-20
- “Assesses likelihood that a patient will become aggressive within a psychiatric inpatient environment”
- Used Violence defined as “occurrence of any behaviour listed on Overt Aggression Scale (OAS)”
  - Verbal aggression
  - Physical aggression vs objects
  - Physical aggression vs self
  - Physical aggression vs other people
- Items relating to physical aggression against staff were eliminated



# BVC

Item	Description
<b>Confused</b>	Appears obviously confused or disorientated. May be unaware of time, place or person.
<b>Irritable</b>	Easily annoyed or angered. Unable to tolerate presence of others.
<b>Boisterous</b>	Behaviour is overtly “loud” or noisy. For example slams doors, shouts out when talking etc.
<b>Physically Threatening</b>	Where there is a definite intent to physically threaten another person. For example the taking of an aggressive stance; the grabbing of another person’s clothing; the raising of an arm, leg, making a fist or modelling of a head-butt directed at another.
<b>Verbally Threatening</b>	A verbal outburst which is more than just a raised voice; and where there is a definite intent to intimidate or threaten another person. For example verbal attacks, abuse, name calling, verbally neutral comments uttered in a snarling aggressive manner
<b>Attacking Objects</b>	An attack directed at an object and not at an individual. For example the indiscriminate throwing of an object; banging or smashing windows; kicking, banging or head butting an object; or smashing furniture



# BVC

## Interpretation of scoring:

Score = 0            The risk of violence is small

Score = 1-2        The risk of violence is moderate. Preventive measures should be taken.

Score > 2        The risk of violence is very high. Preventive measures should be taken  
In addition, a plans should be developed to manage the potential violence.

Monday / /	Day	Evening	Night
Confused			
Irritable			
Boisterous			
Verbal threats			
Physical threats			
Atacking objects			
SUM			

Highest score within last 24hrs predicts risk level

Training & App



# DASA IV

Item	Description
<b>Irritability</b>	Easily annoyed or angered and unable to tolerate presence of others
<b>Impulsivity</b>	Affect / behaviour unpredictable with dramatic shifts
<b>Unwillingness to follow instructions</b>	Angry and/or aggressive when asked to adhere to routine or participate in some aspect of treatment
<b>Sensitive to perceived provocation</b>	Interpreted actions of others as deliberate and harmful to them. Respond disproportionately if provoked. Overly sensitive, quick to anger
<b>Easily angered when requests are denied</b>	Easily angered when requests not granted immediately, no delay of gratification, markedly surly, angry or aggressive when denied a request
<b>Negative attitudes</b>	Definite, serious negative attitudes exhibited (antisocial, psychopathic thinking, attitudes about authority...may consider general pessimism)
<b>Verbal threats</b>	Made verbal threats, been verbally aggressive, shouted, insulted, cursed or attempted to intimidate another person

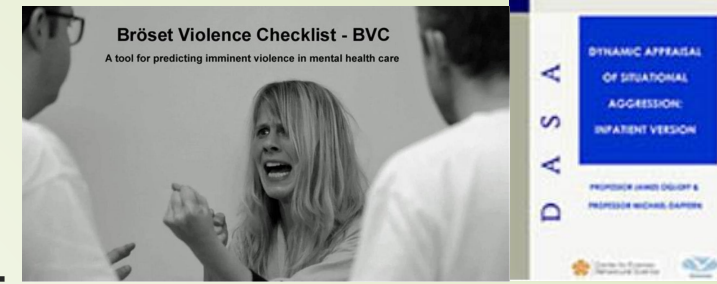
# DASA IV

- ▶ If indicator is present for 7 days without violence score a zero unless a marked increase from baseline
- ▶ No typical cut off score but higher scores represent an increasing probability of imminent aggression.
- ▶ “each increase in total score, there was 1.77 times increased likelihood patient behave aggressively in next 24hrs”

# DASA IV

- Original study (2006):
  - 18% of aggressive patients scored 1 to 3
  - 15% of aggressive patients scored 4 or 5
  - 55% of aggressive patients scored 6 or 7
- Generally accepted & research indicates:
  - score of 0 or 1 indicates 'low' risk
  - score of 2 or 3 indicates 'moderate' risk
  - score of 4 or more indicates 'high' risk

# BVC / DASAIV Comparison

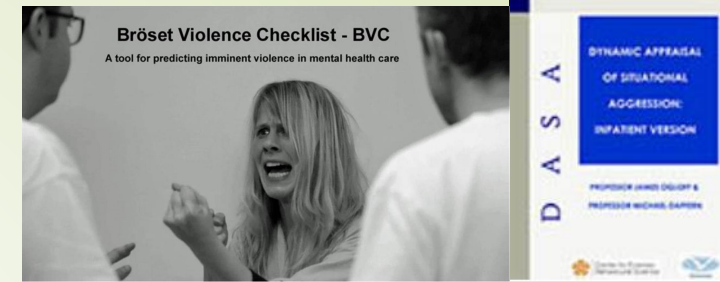


Timing

Sustained presence of an item

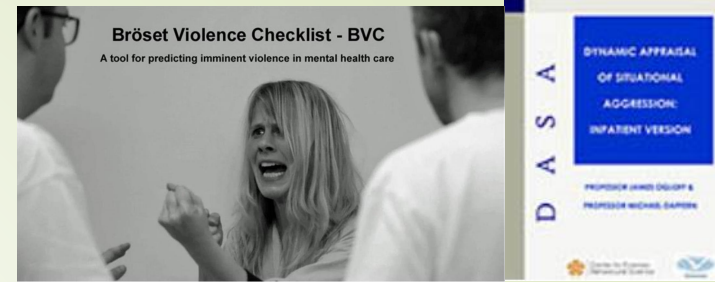
BVC		DASA IV
Irritable	★	Irritability
Verbally threatening	★	Verbal threats
Boisterous	★	Impulsivity
Confused		Sensitive to perceived provocation
Physically threatening		Unwillingness to follow instructions
Attacking objects		Easily angered when requests are denied
		Negative attitudes

# BVC / DASAIV Comparison



Tool	Item	Definition
BVC	Boisterous	Behaviour is overtly “loud” or noisy. For example slams doors, shouts out when talking etc.
DASA IV	Impulsivity	Affect / behaviour unpredictable with dramatic shifts

# BVC / DASAIV Comparison



Timing

Sustained presence of an item

BVC		DASA IV
Irritable	★	Irritability
Verbally threatening	★	Verbal threats
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# Why should we use them?

- ▶ Can't clinicians use their judgement?

Yes, but.....

Timing

Subjective variability

Staff shifts

Terminology

....



# Do we know they are the right tools?

Reliability



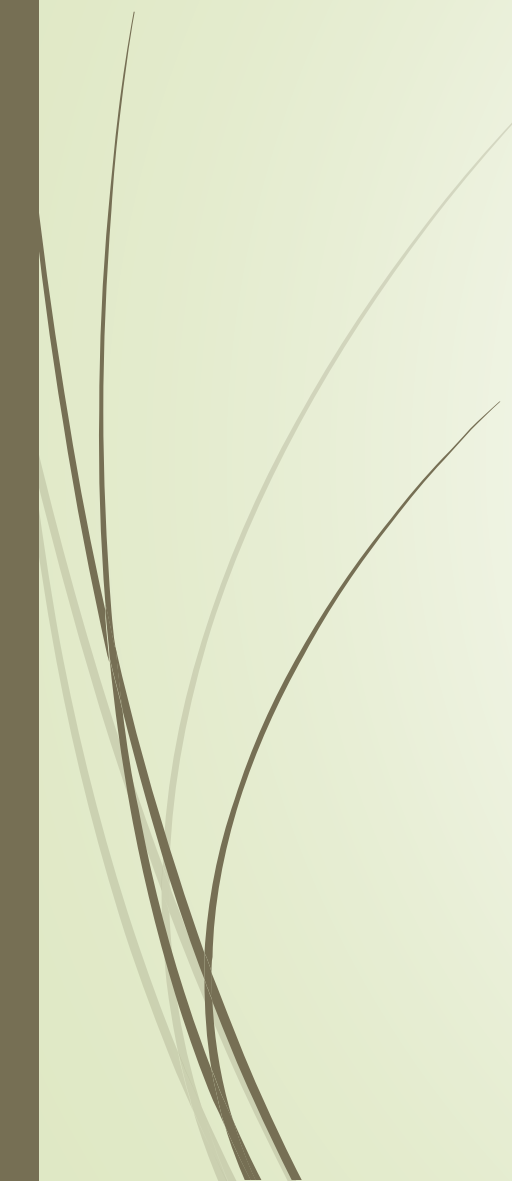
Validity







# Validity

- True Positives
  - False Positives
- 





# Validity

➤ True Positive Rate

$$\frac{\text{Those who are predicted to be violent and were violent}}{\text{All those who were violent}}$$

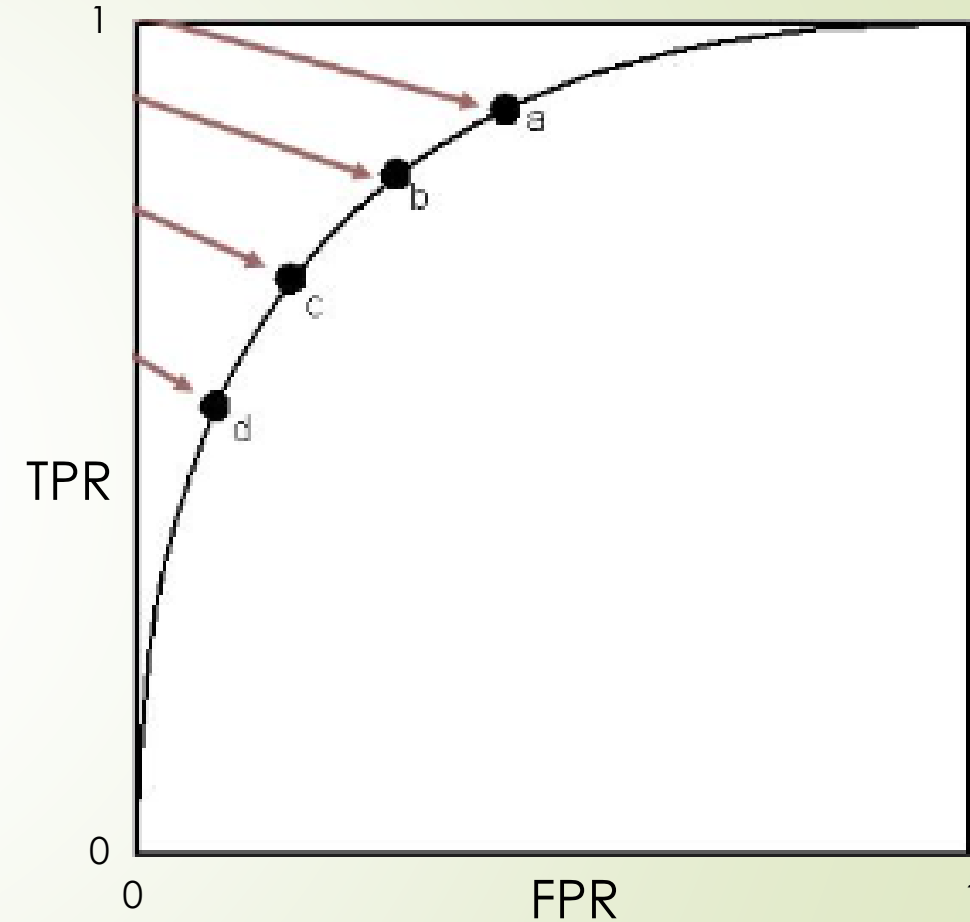
➤ False Positive Rate

$$\frac{\text{Those who are predicted to be violent but weren't violent}}{\text{All those who weren't violent}}$$

# Validity

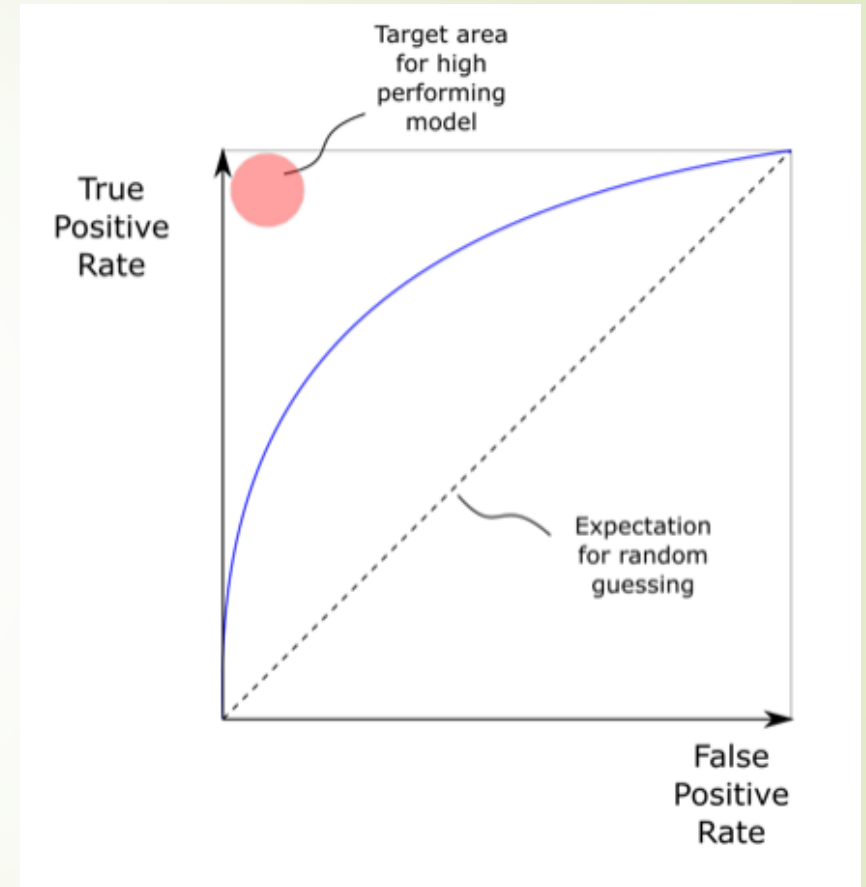
- Choose threshold (a, b, .....
- Plot True Positive Rate (TPR) against False Positive Rate (FPR)

At different thresholds for the test



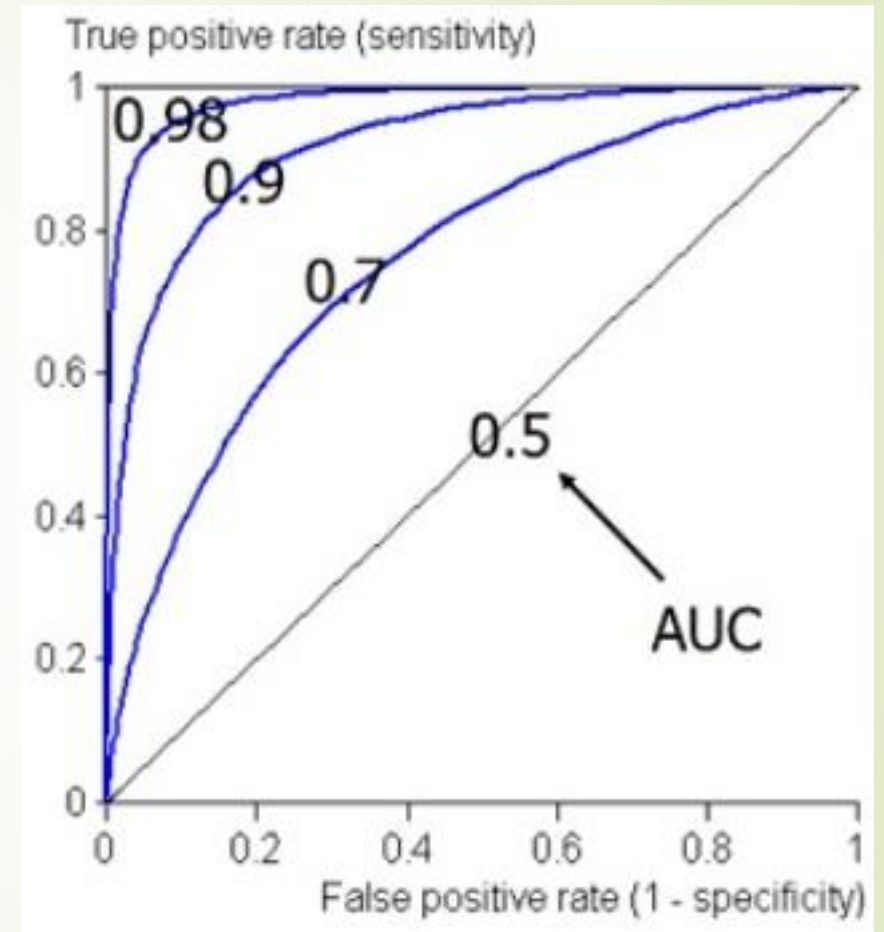
# Validity

- Best threshold for a valid test



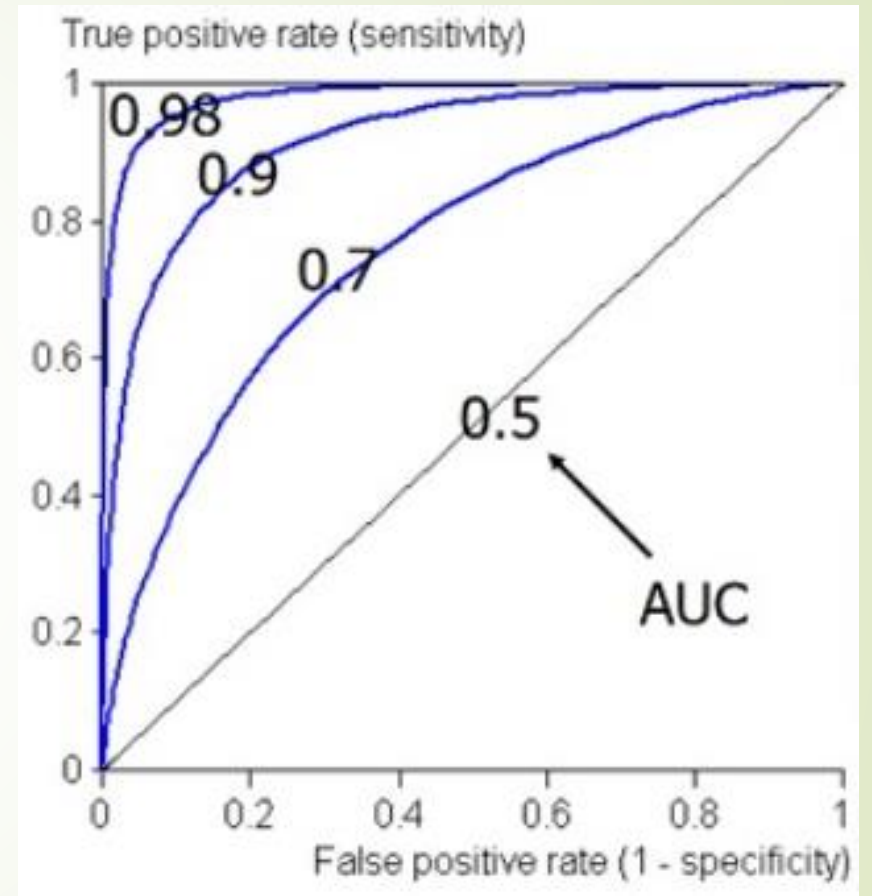
# Validity

- The greater the Area under the Curve (AUC), the more valid the test

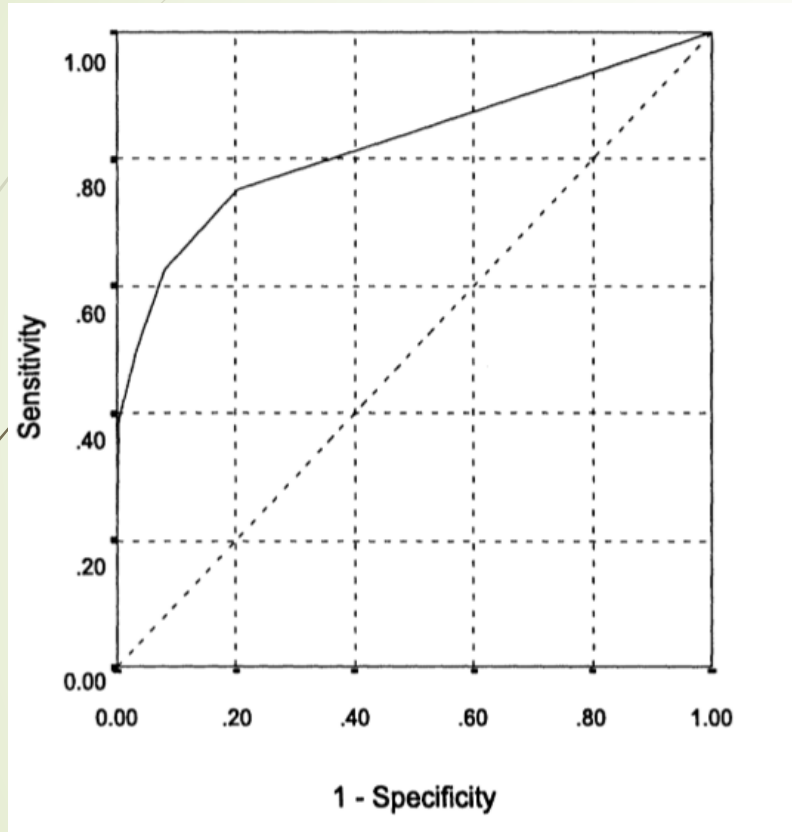


# Receiver Operating Characteristic Curve

➔ AUC of ROC

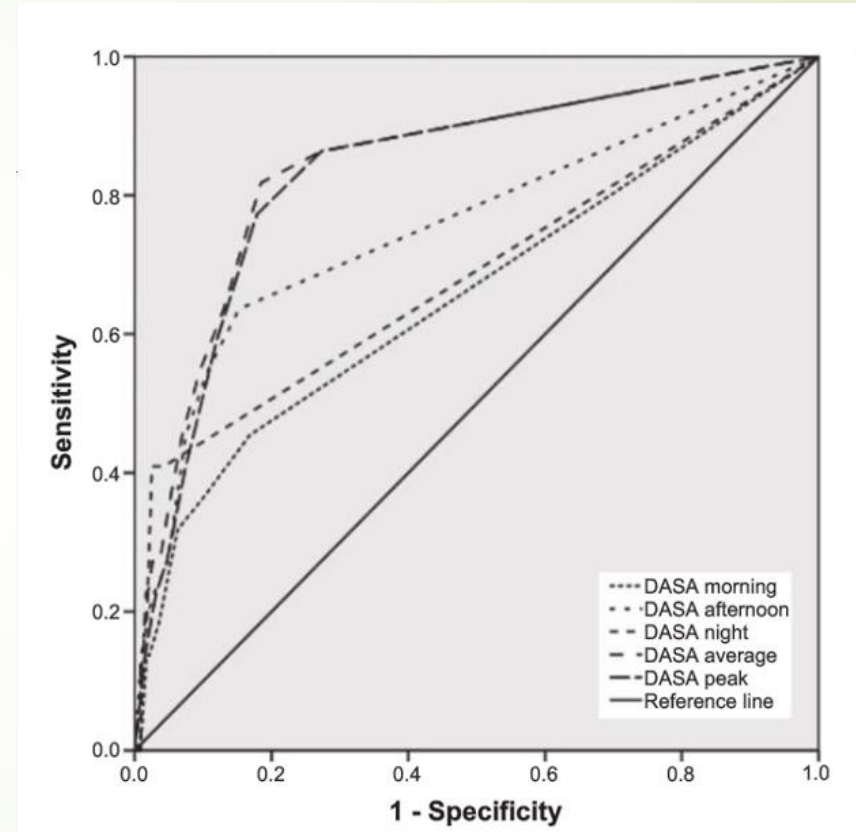


# BVC



**AUC = 0.82** (95% CI 0.75 – 0.89)

# DASA-IV



**AUC = 0.84** (95% CI 0.75 – 0.92)



# Positives vs Negatives

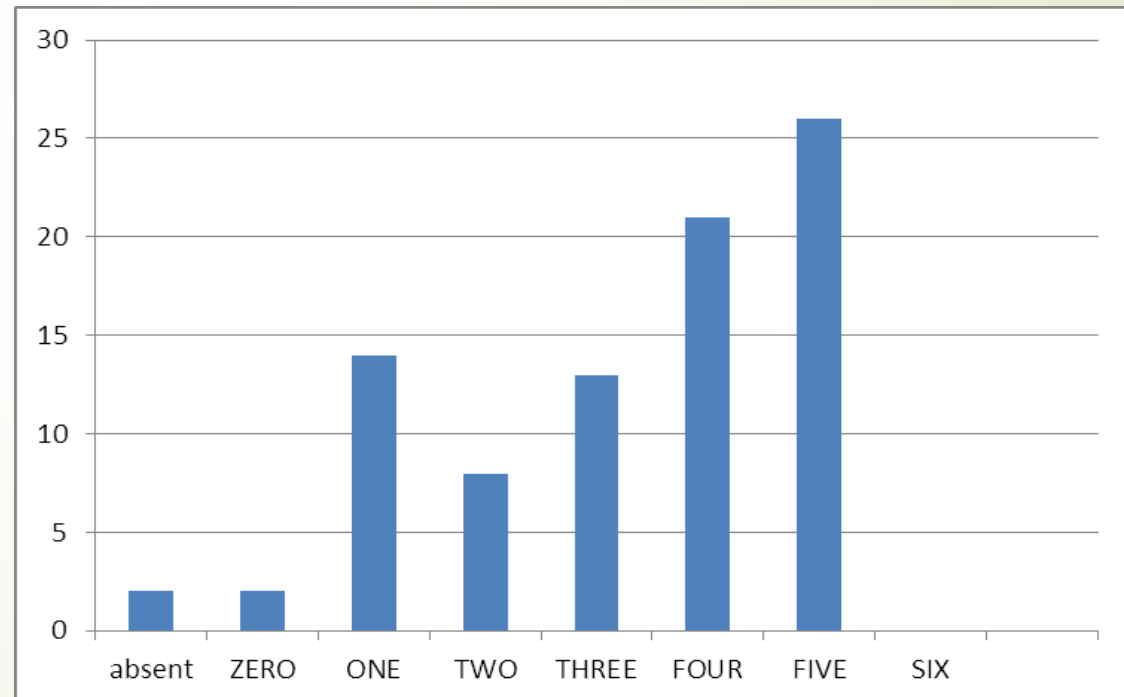
- "Early prevention" & Positive Behavioural Support (reason DASA developed)
- Establish patterns of individual patient behaviour
- Can it show the "aggression temperature" on the ward in general?
- Based only on patient behaviour – not why.
- Interpretation of scores too rigid
- Over-reliance (the risk of false positives and false negatives are forgotten)

	Monday / /			Tuesday / /		
	Night	Day	Eve	Night	Day	Eve
Confused						
Irritable						
Boisterous						
Verbal threats						
Physical threats						
Attacking objects						
<b>SUM</b>	/	/	/	/	/	/
<b>INTERVENTIONS</b>						
0 = no interventions	INIT		DATE/TIME	SIGNAT		
1 = verbal de-escalation						
2 = diversional activity						
3 = ↓ stimulation						
4 = sensory modulation						
5 = medication						
6 = continuous supervision						
7 = seclusion						
8 = restraint						

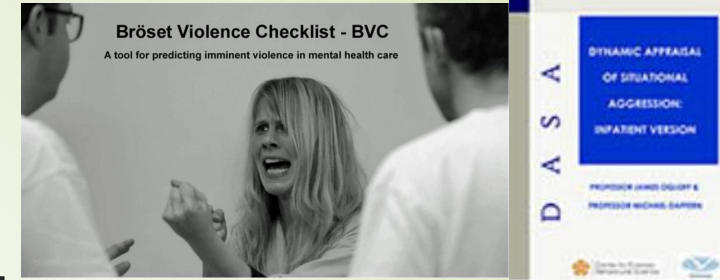
# Positives vs Negatives

- ▶ Taylor & Large (2013) question the predictive validity of the DASA, noting that of 200+ patients identified as potentially becoming aggressive, only one actually will. (This “low base rate” problem is the same issue affecting violence risk assessment and suicide risk assessment.)

Don't the tools  
measure aggression  
anyway?



# BVC / DASAIV Comparison



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# Positives vs Negatives

- Also statisticians query if ROC is the best way of measuring validation.....
- binary logistic generalized estimating equation model)





# Summary

- NICE
  - What
  - Comparison
  - Validity
  - Positives and Negatives
- 
- Useful in Risk Management especially in planning interventions

