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Saturday, August 10, 2019

(Room 6)

17:35 - 18:30 WS #141: Predicting Motor Recovery after Stroke - Why and How
(Not Repeated)



THE UNIVERSITY OF
AUCKLAND
Te Whare Wānanga o Tāmaki Makaurau
NEW ZEALAND

Predicting recovery of movement after stroke – why and how?

Professor Cathy Stinear



JULIUS BRENDDEL
TRUST



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Patients and their families



Outline

- Predicting upper limb recovery after stroke
- PREP2 algorithm for predicting upper limb outcomes
- Supporting PREP2 predictions
- Summary

Case Study – Mrs Parata



Will my hand
get better?

- 76 yo
- Previously independent
- R hand dominant
- Enjoys gardening and looking after grandkids
- Stroke 7 weeks ago (L lacunar infarct), discharged home 5 weeks ago

Currently:

“I’m doing ok but my arm is still not very good. Will it ever get better? I thought I would be better by now”

Case Study – Mrs Parata

Patient reports:

- walking independently but ongoing difficulties with weakness in right hand and arm
- using left hand to operate phone and pour drinks
- can use right hand for some basic tasks like pushing or pulling
- “really good at using my left hand now”

Discharge report:

- Significant R hemiplegia
- Ongoing community physiotherapy



Discussion

- How confident are you in answering Mrs Parata's question?
- What would you say?

1

2

3

4

5

Not at all
confident

Not
confident

Neutral

Somewhat
confident

Very
confident

“When will I get better?”

“Everyone is different”

“It’s still fairly early days”

“Let’s just see how you go in the next few weeks”

“If you work really hard you’ll get there”

“If you stay positive you’ll get there”

“I don’t know”

“The brain can rewire itself and make new connections”

“How long is a piece of string?”

The problems

Accuracy

- Are we giving our patients accurate information about their recovery potential?

Consistency

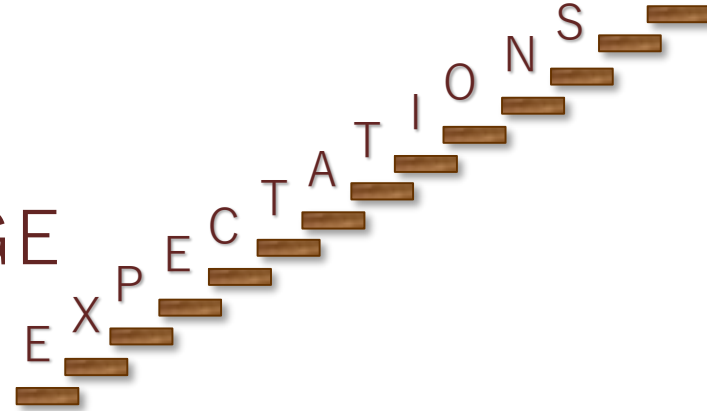
- How many different messages are our patients hearing?
- Inconsistent information might be worse than none at all

Accurate predictions are useful

TAILOR
REHABILITATION
GOALS



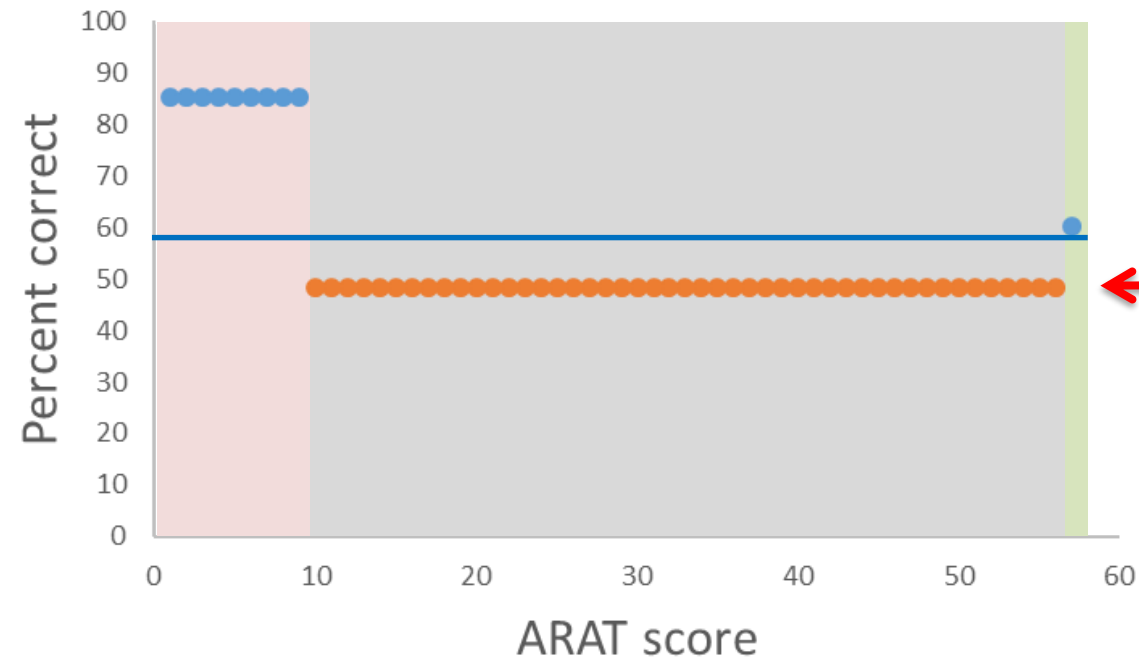
MANAGE
PATIENT



USE TIME AND RESOURCES TO
BRING THE BEST
OUTCOME
FOR THE
PATIENT



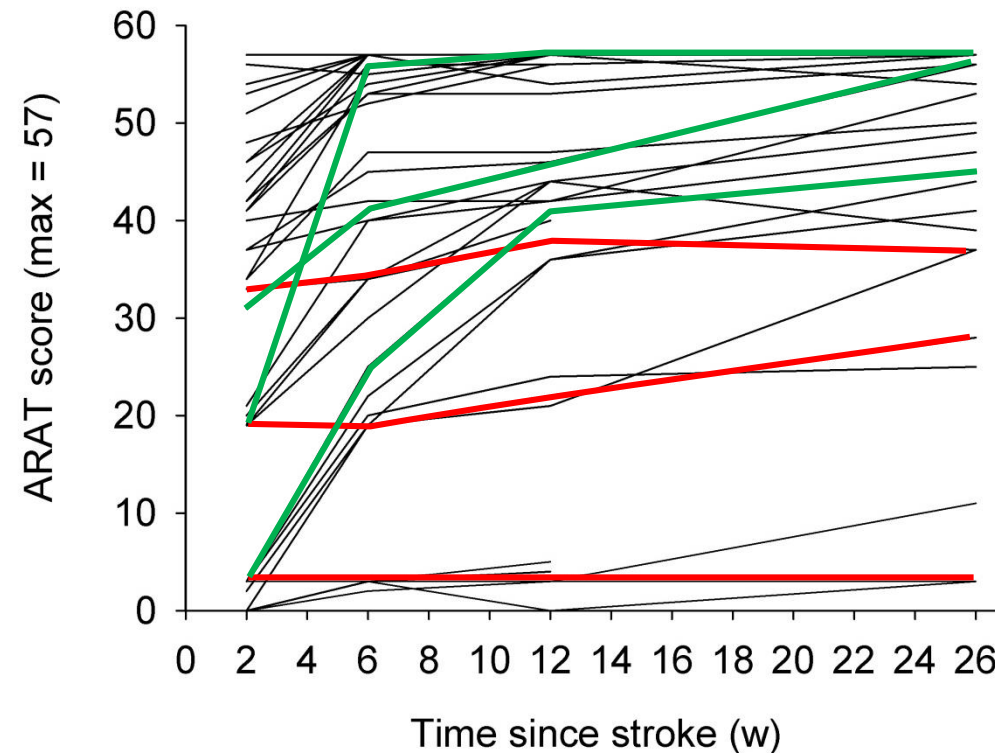
How good are we at predicting now?



Prediction is difficult

Patients who are similar at first can have very different recoveries

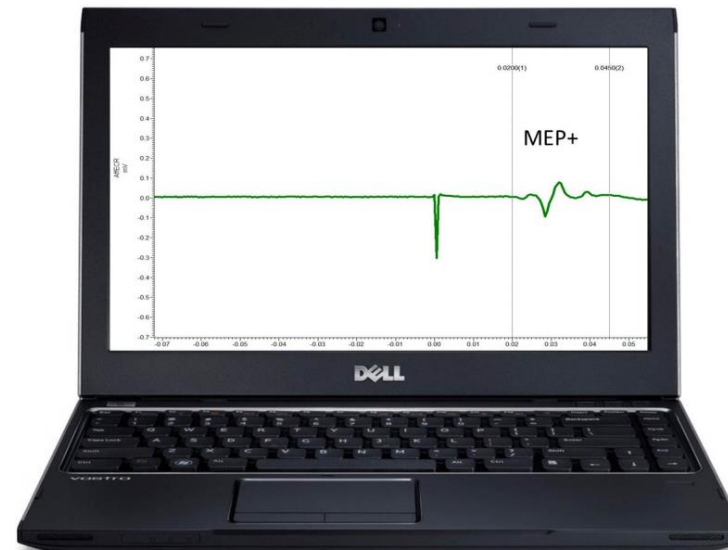
Brain biomarkers can be useful



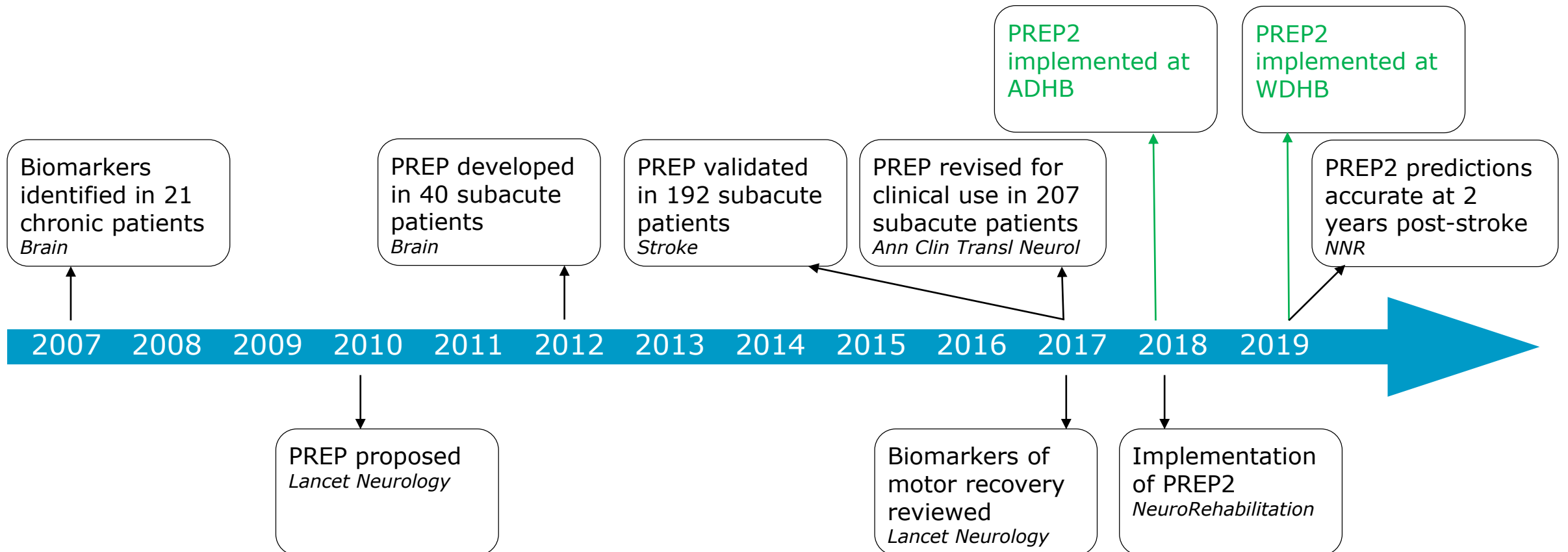
Biomarkers for stroke recovery

Biomarkers of damage to descending motor pathways

- Can we still get a message through to the arm and leg?
Transcranial magnetic stimulation



Development of PREP2



www.presto.auckland.ac.nz

PRESTO



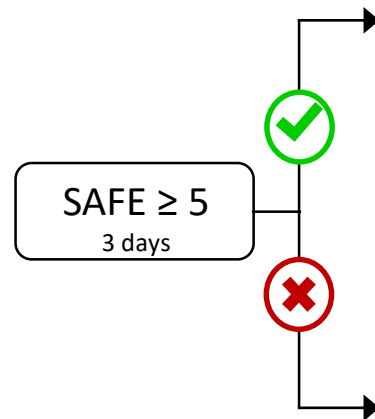
Predict Stroke Outcomes

PREP2

Welcome

This site provides tools and resources for predicting outcomes for individual patients after stroke.
The [PREP2 algorithm](#) predicts functional outcomes for the upper limb.

PREP2 algorithm



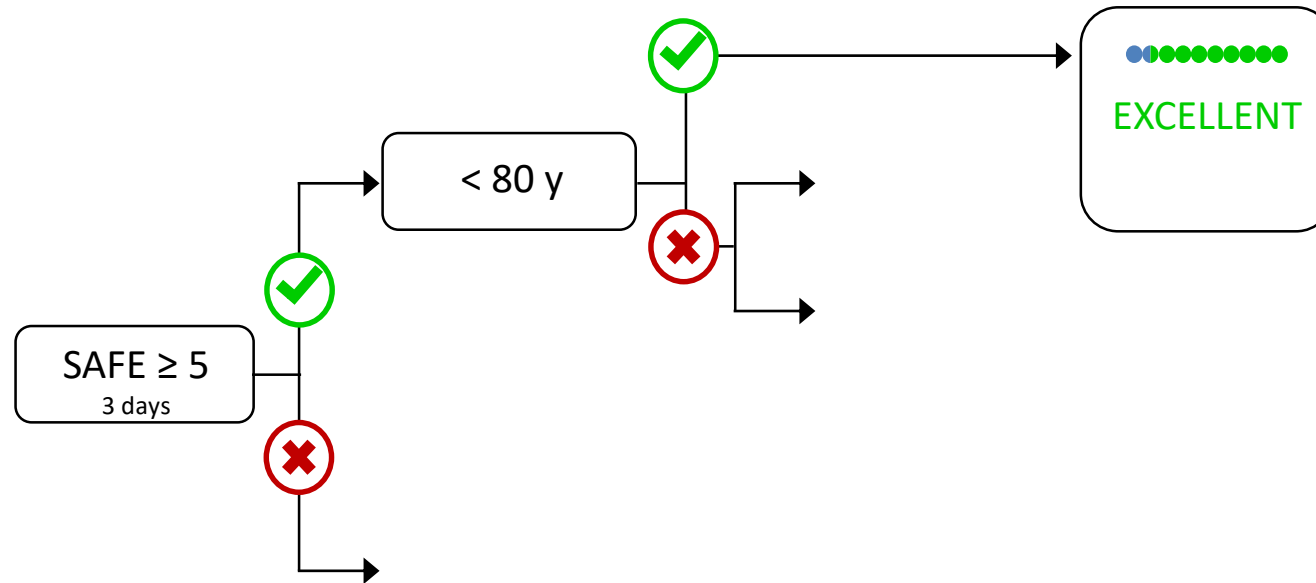
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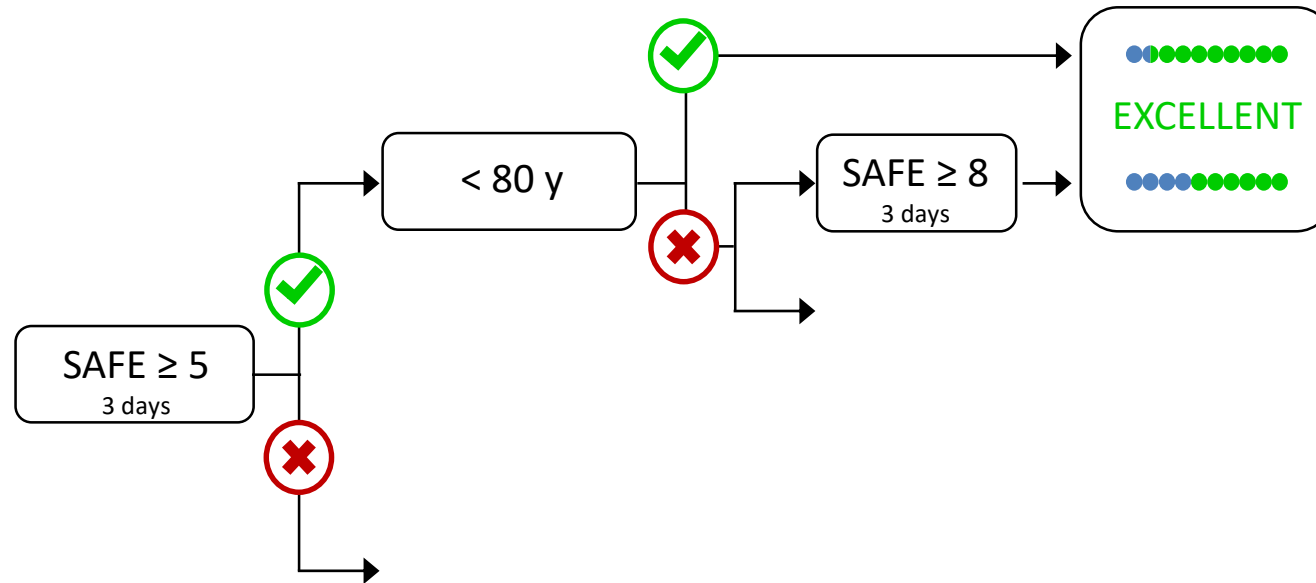
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SAFE score out of 10

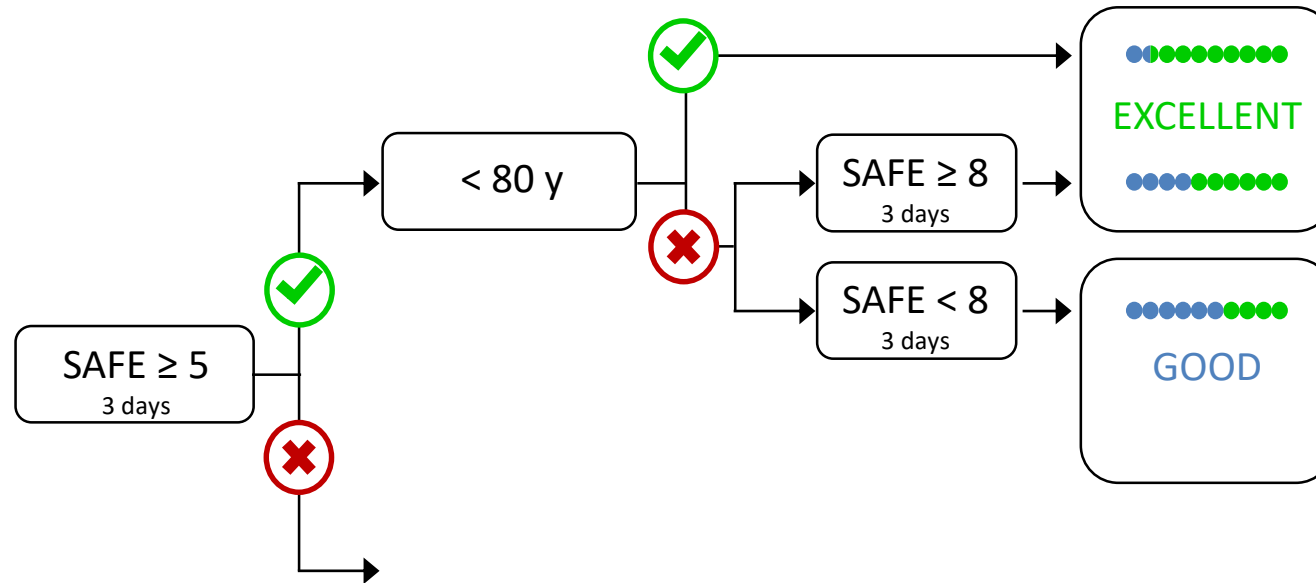
PREP2 algorithm



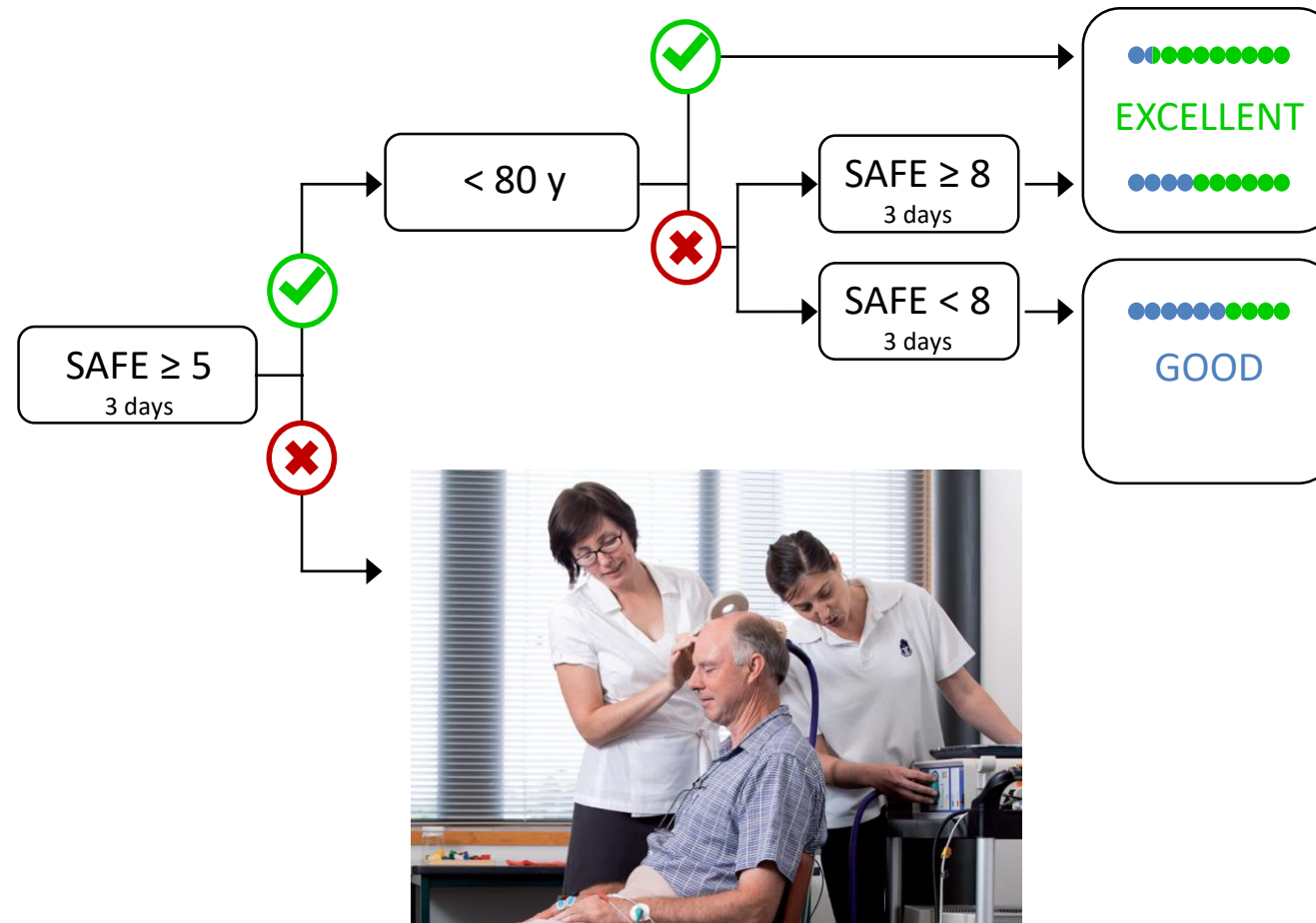
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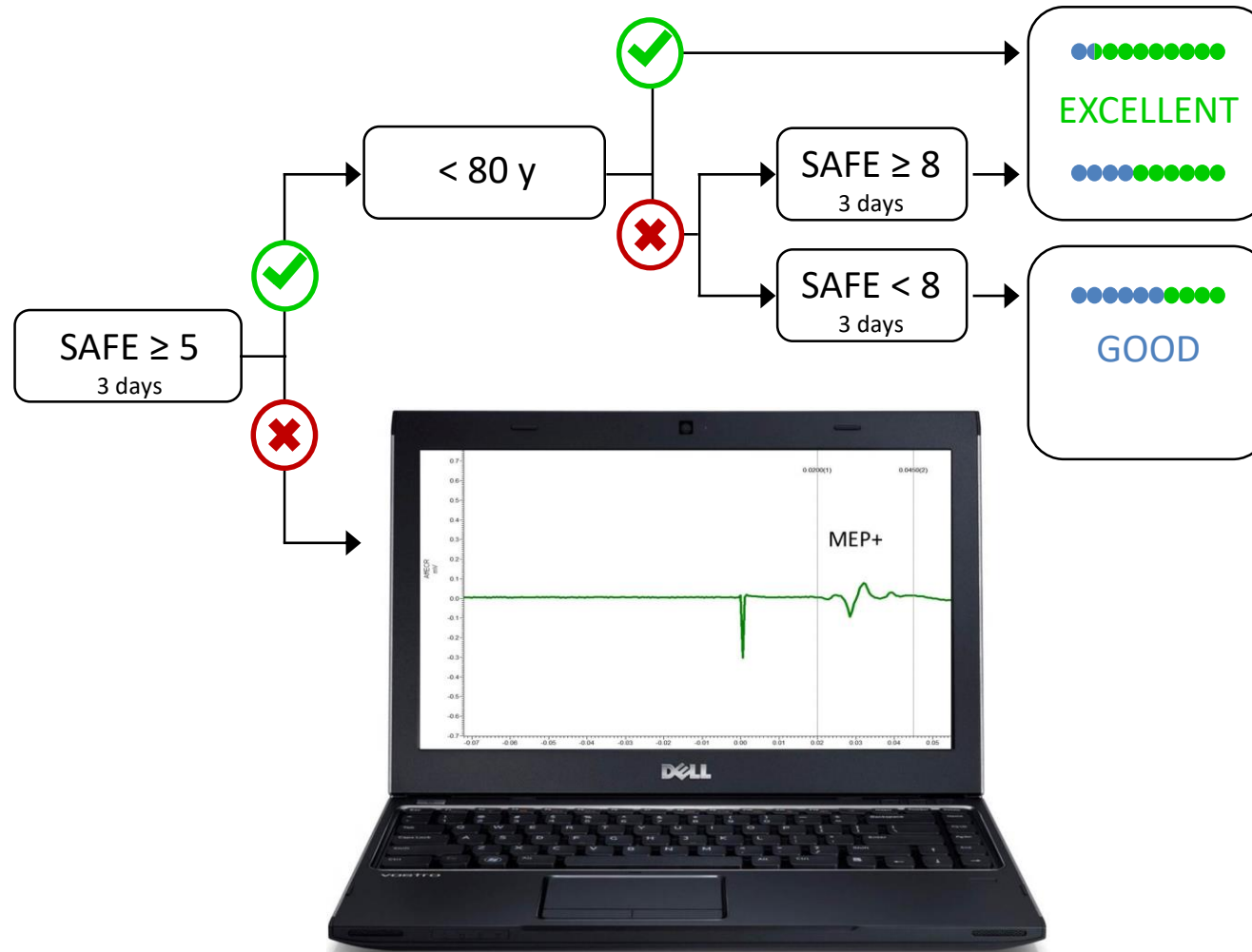
PREP2 algorithm



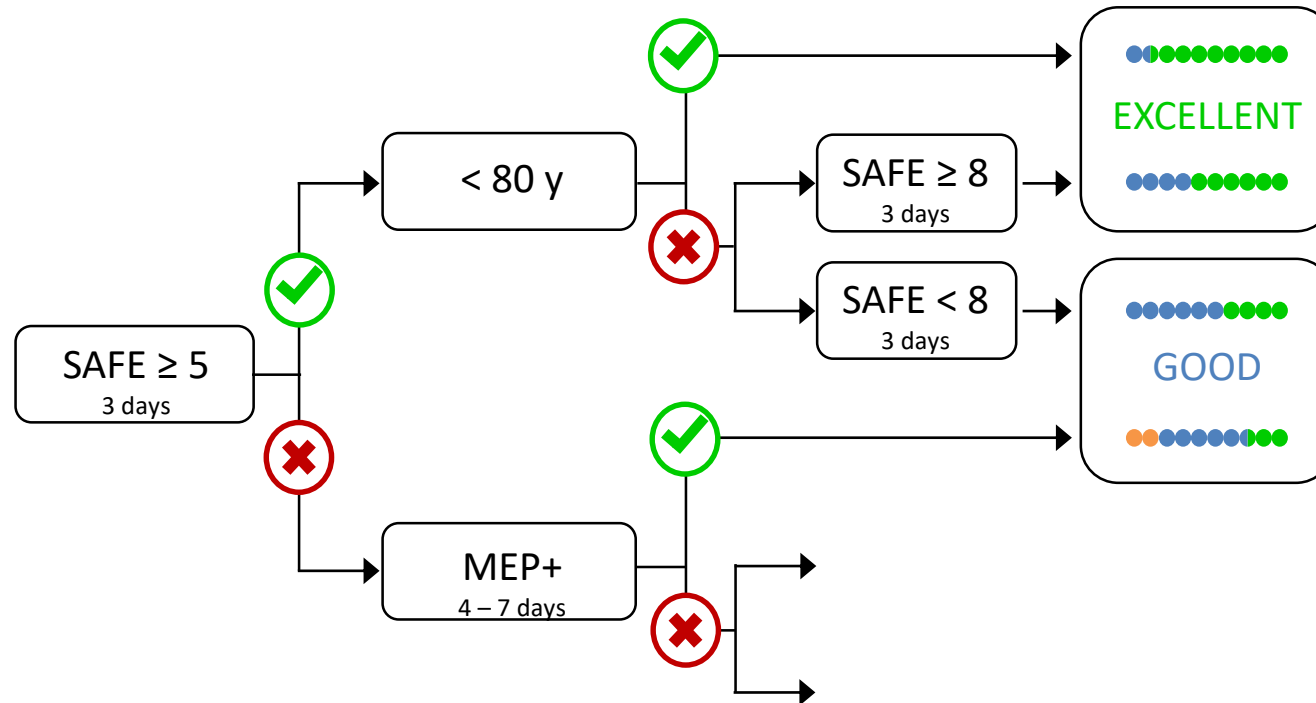
PREP2 algorithm



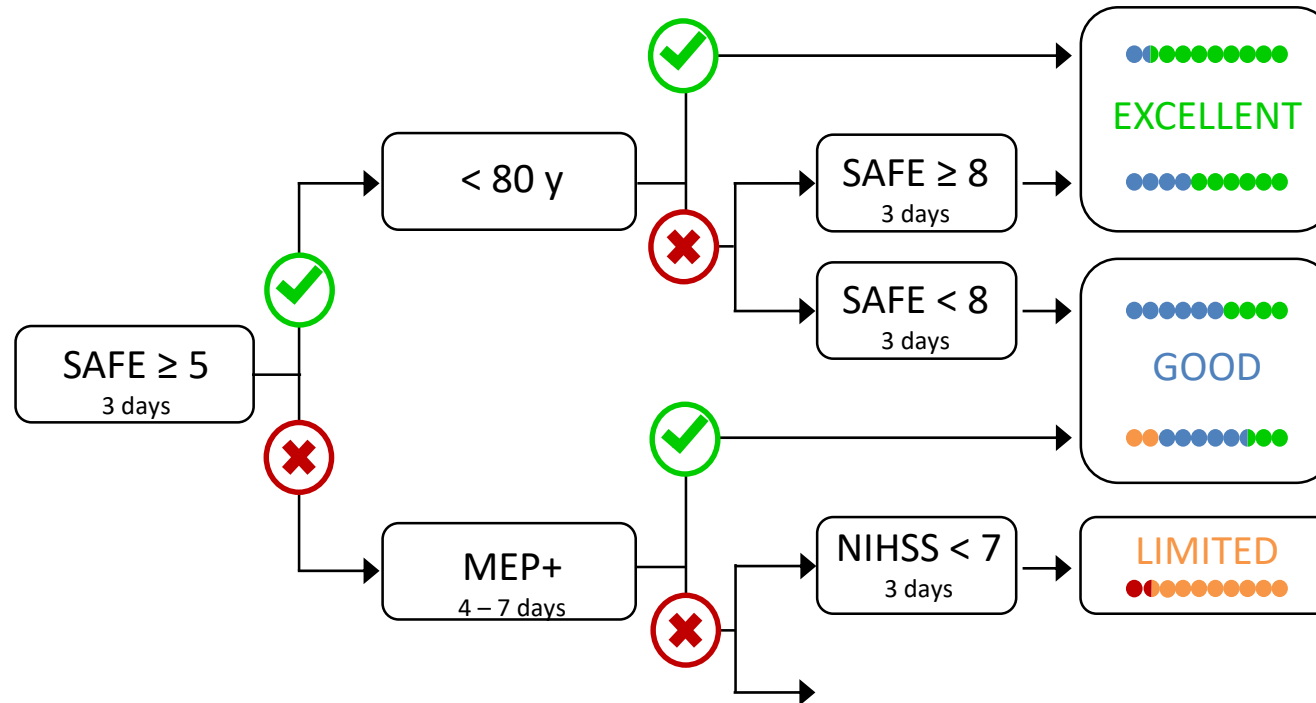
PREP2 algorithm



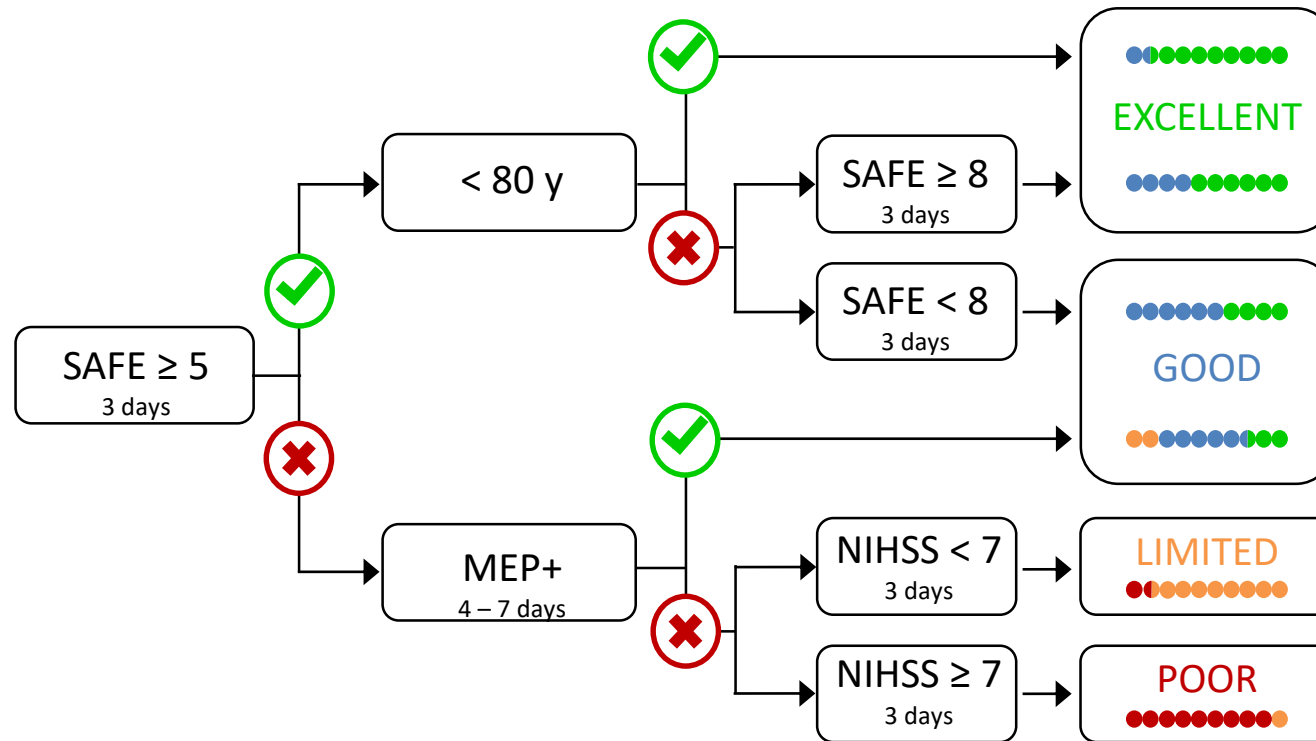
PREP2 algorithm



PREP2 algorithm



PREP2 algorithm



Accurate for 75% of patients

Prediction	Outcome	Goal	Rehabilitation
Excellent	Able to use hand fairly normally for most ADLS	Promote normal use	• Strength • Coordination • Fine control • Avoid compensation

Prediction	Outcome	Goal	Rehabilitation
Limited	Voluntary movement, possibly grasp, but fine finger control unlikely	Promote movement	• Maintaining strength • Flexibility • Task adaptation • Bilateral practice

What happens when we use it?

PREP algorithm information gave therapists more **confidence**

More **focused** upper limb rehabilitation, **tailored** to the recovery potential of **individual** participants, may have contributed to **shortened length of stay** by around 1 week

PREP information may **increase rehabilitation efficiency**, with no negative effects on patient outcomes

Stinear et al., Stroke, 2017

Stroke

JOURNAL OF THE AMERICAN HEART ASSOCIATION

What happens after 3 months?

- PREP2 predictions accurate at 2y for 80% of participants
 - About 10% do better than expected
 - About 10% do worse than expected
- PREP2 category stayed stable between 3m and 2y for 83% of participants
- PREP2 category changed for 17% of participants
 - all with a Good or Excellent prediction

Case Study – Mrs Parata



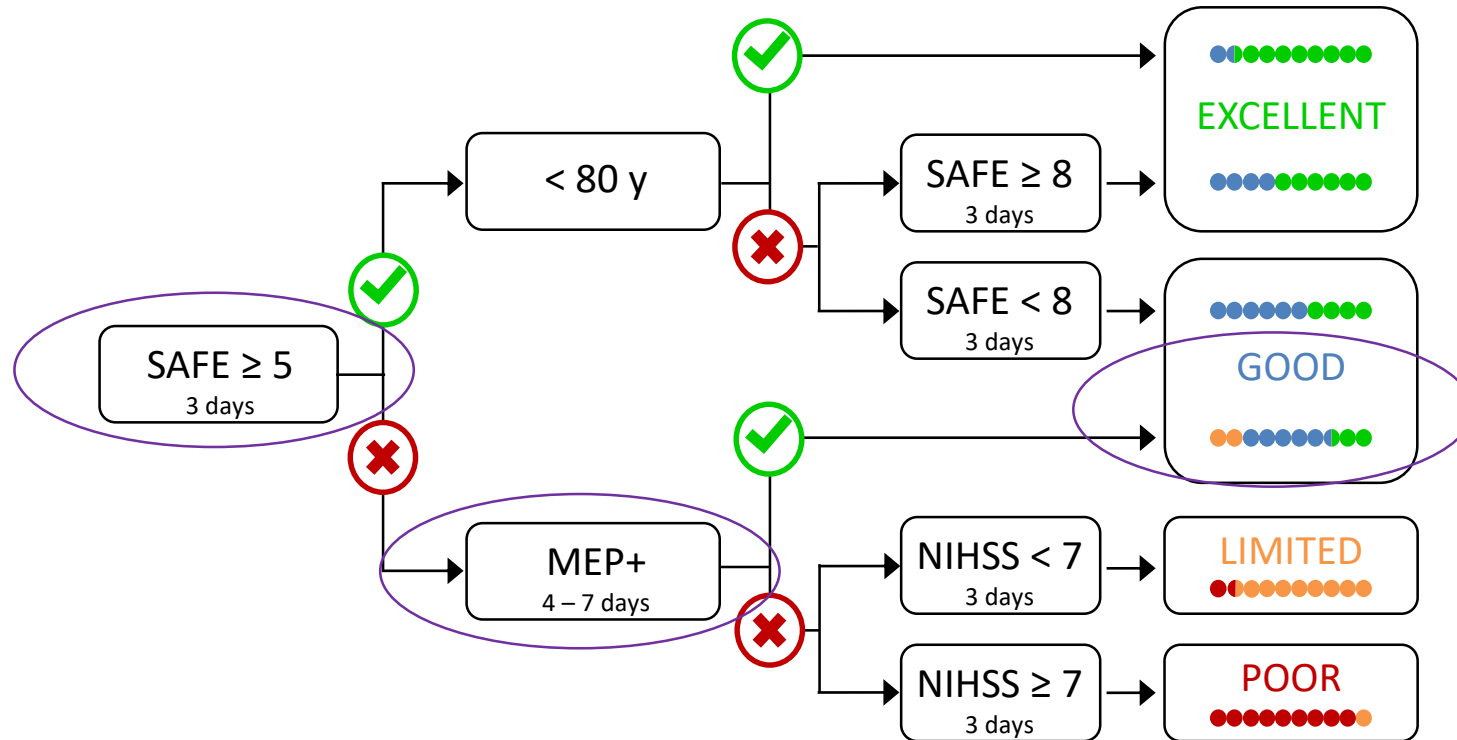
*Will my hand
get better?*

- 76 yo
- Stroke 7 weeks ago
- Concerns about ongoing R) upper limb function and progress

PREP2 information:

- Day 3 SAFE score was 2/10
- MEP+
- Predicted to have a “Good” UL functional outcome by 3 months

PREP2 algorithm



Discussion

With this new information, would you change your response to Mrs Parata?

Things to consider

Reorientate expectations

Does she understand the prediction?

Discuss
prediction

Does she understand recovery timeline?

Making good progress

Not making a full recovery is disappointing

Support

Is she getting enough therapy to
work towards her expected outcome?

Ongoing
therapy needs?

Does she have community support to
live her best life possible?

Case Study - Mr Jones

- 45 yo
- L) MCA infarct 2 months ago
- Worked as a bank manager prior to stroke
- Lives with wife and 3 young children

Currently: Unable to use right arm at all,
dense hemiplegia, walking independently

“They didn’t give me enough therapy in the hospital. If they had, my arm would be much better by now. How can I get more therapy to fix my arm? When will I be able to use my arm again?”



Case Study - Mr Jones

Patient reports:

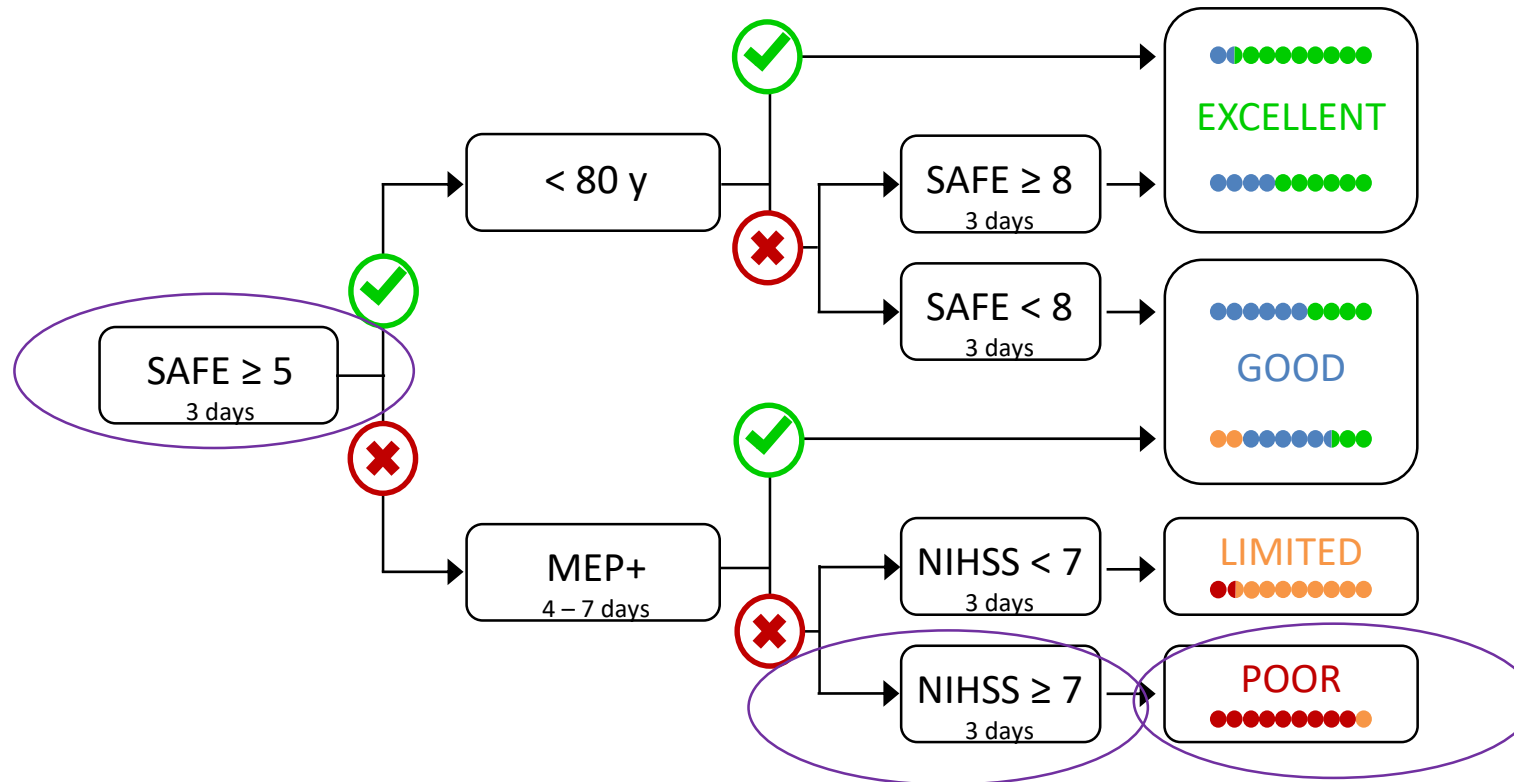
- Improving movement in his arm but very slow
- Can't use his hand yet
- Needs to get back to work to pay the mortgage

Discharge summary:

- SAFE score 0/10 on day 3
- NIHSS score 8 on day 3
- MEP- on TMS
- Predicted to have a "Poor" UL functional outcome at 3 months



PREP2 algorithm



Discussion

What would you say to Mr Jones?

Will you refer him for more therapy?

Things to consider

Reorientate expectations

Does he understand the prediction?

His pathways to the hand and arm are damaged

Does he understand recovery timeline?

Discuss
prediction

He is progressing as expected

We are only talking about hand and arm

Not making a full recovery is disappointing

Is he getting enough therapy to help
him learn to use the left hand?

Support

What are his therapy goals?

Ongoing
therapy needs?

Does he have community support to
live his best life possible?

Is he getting support to return to
work and driving?

Community support

- Community rehabilitation – through DHB
- Stroke foundation
 - Patient education
 - Return to work
 - Social interaction
- Return to driving assessments
- Private providers
- Spiritual, psychological, cultural support

What about hope?

- We can support our patient's hope *and* provide accurate information
- Our patients deserve to know what to expect
- Patients are defining themselves and their lives after their stroke
- We can help them calibrate what they are hoping for and how they hope to achieve it
- Difficult conversations become less difficult with training, practice and support
- Patient may need access to psychological, cultural or spiritual support

Don't kick the can down the road

Take home messages

- Providing information to our patients about their expected recovery is important to them, their whānau and their clinical team
- To make accurate predictions we need to combine biomarkers with clinical assessments
- PREP2 provides accurate predictions for expected UL function at 3 months post-stroke
- GPs play an important role in supporting patients who receive this information
- Our patients deserve to know what to expect so they can adjust to life after stroke

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