Professor Cathy Stinear

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Saturday, August 10, 2019

(Plenary)

9:30 - 9:50 Recovery of Movement after Stroke

Recovery of movement after stroke

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Department of Medicine

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Allied health, medical and nursing teams

Patients and their families



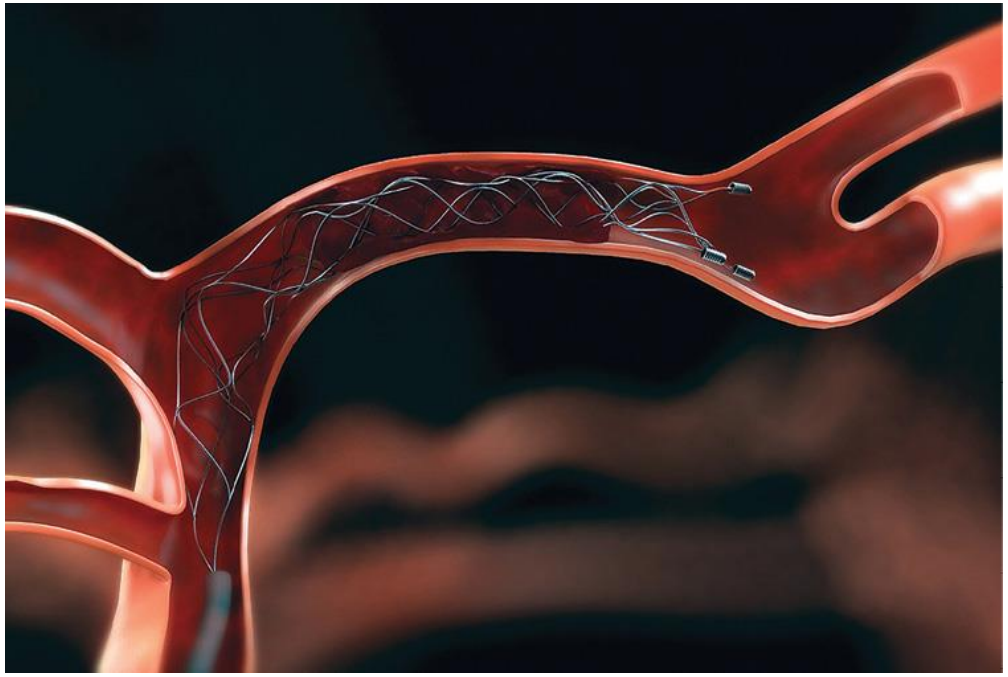


Stroke

- Stroke is the most common cause of adult disability worldwide
- There are almost 10000 strokes per year in New Zealand
- At any point in time, there are around 56,000 stroke survivors in New Zealand

Hyperacute stroke management

Thrombolysis



Clot retrieval

“When will I get better?”

“How long is a piece of string?”

“Everyone is different”

“It’s early days”

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

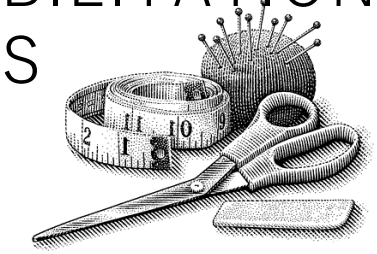
“I don’t know”

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

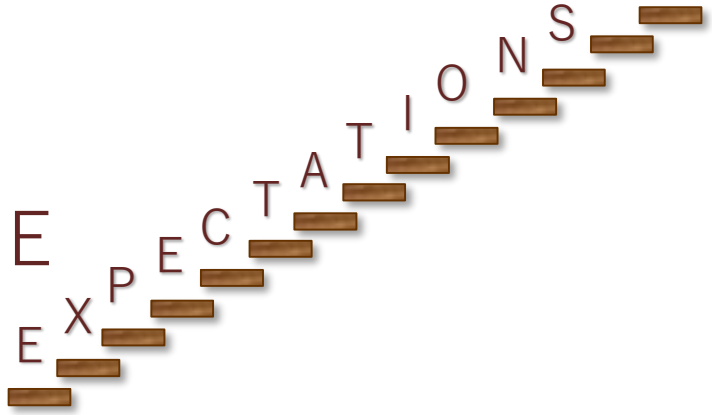
And yet this information is important for both the patient and their clinical team

Accurate predictions are useful

TAILOR REHABILITATION GOALS



MANAGE PATIENT EXPECTATIONS



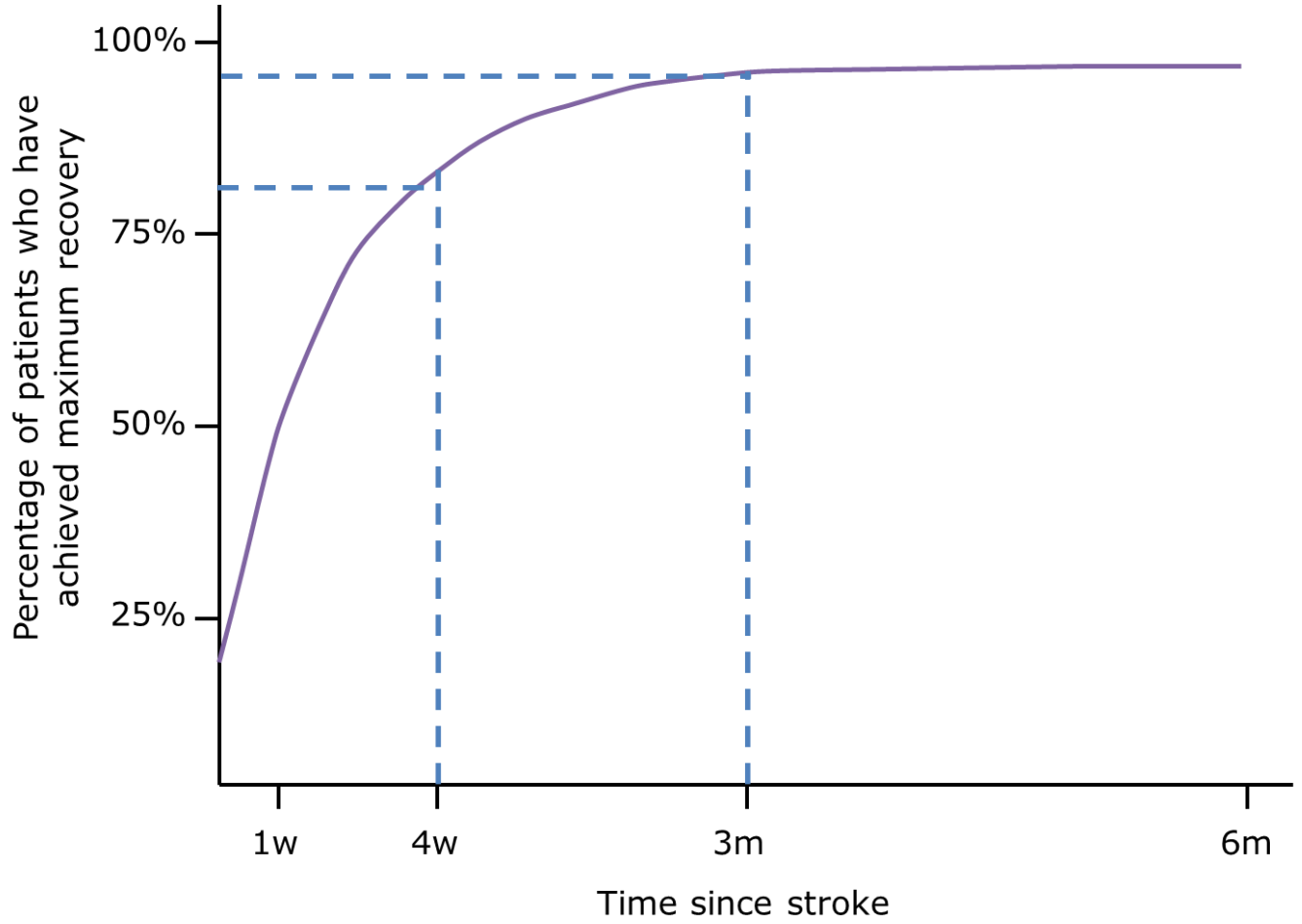
USE TIME AND RESOURCES TO BRING THE BEST OUTCOME FOR THE PATIENT

EARLY DISCHARGE PLANNING

Motor recovery

- 80% of people reach their maximal function by 4-5 weeks
- 95% reach maximal function by 3 months
- Patients' UL function remains stable between 3 months and 2 years

Smith et al, 2019



How good are we at predicting now?

Predicting upper limb function

Nijland et al., Physical Therapy, 2013

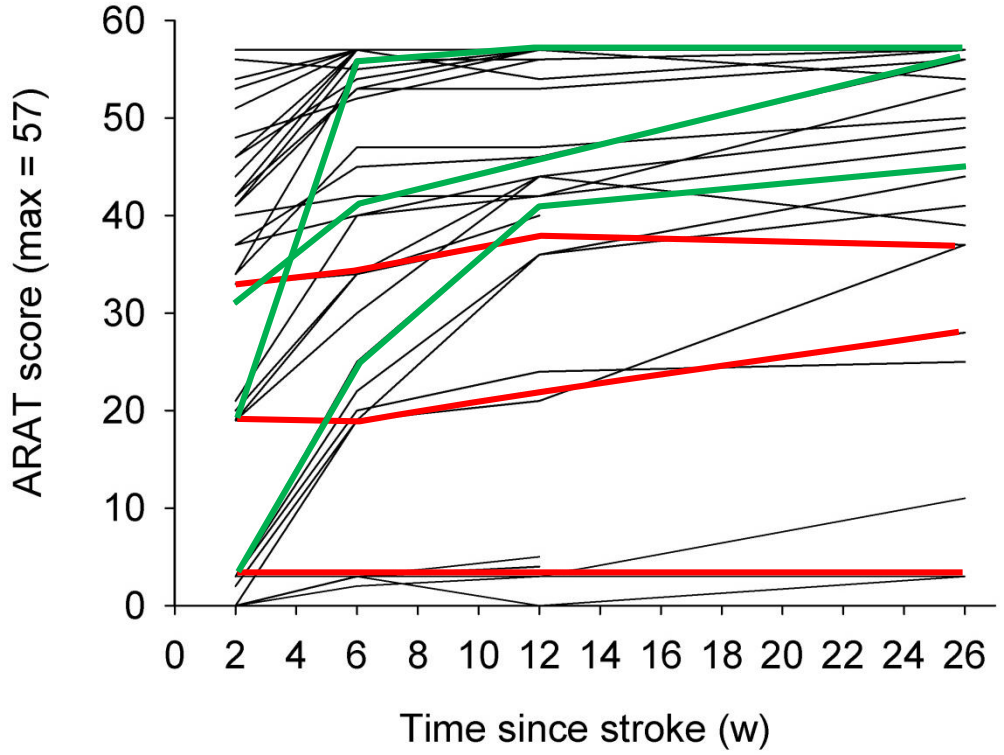
Predicting when someone will walk independently

- Accurate 34%
- Too optimistic 38%
- Too pessimistic 28%

Prediction is difficult

Patients who are similar at first can have very different recoveries

Brain biomarkers can be useful



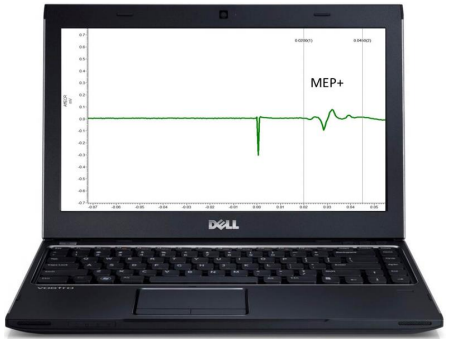
Stinear et al., Brain, 2012

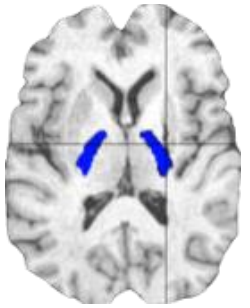
Biomarkers for stroke recovery

Biomarkers of damage to descending motor pathways

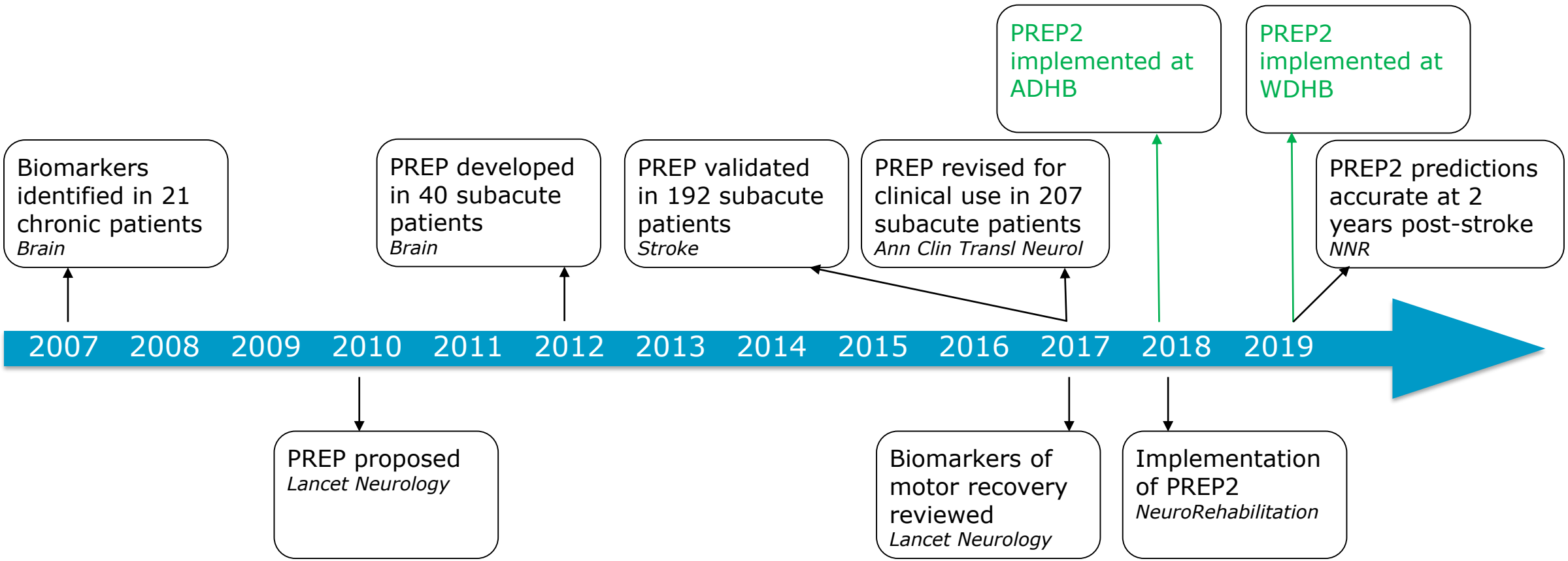
- Can we still get a message through to the arm and leg?
  Transcranial magnetic stimulation

- How much does the stroke overlap the motor pathways?
  MRI scan





Development of PREP2



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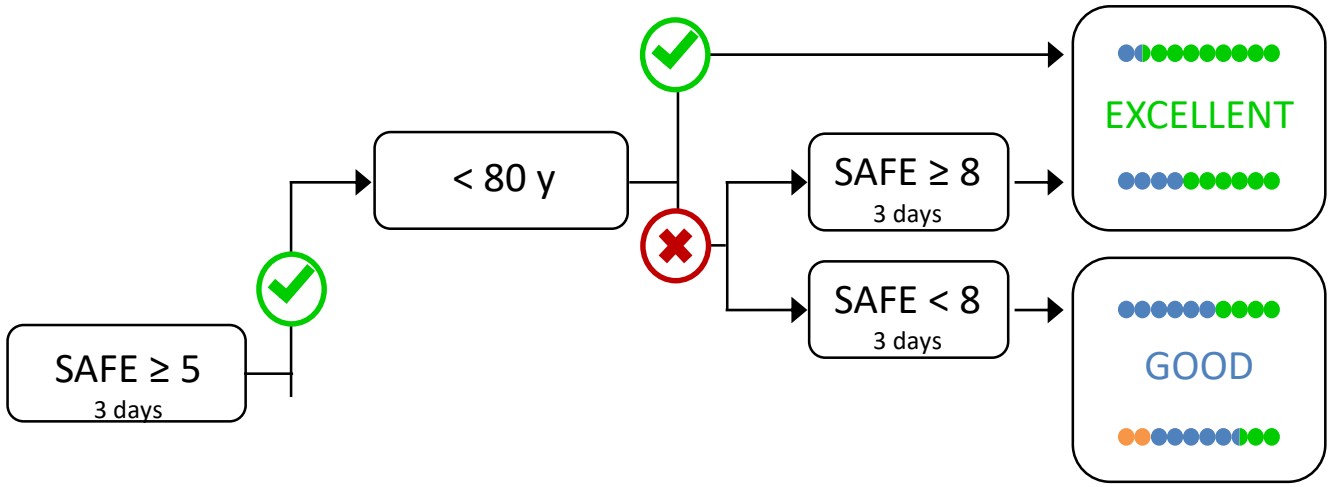
PREP2

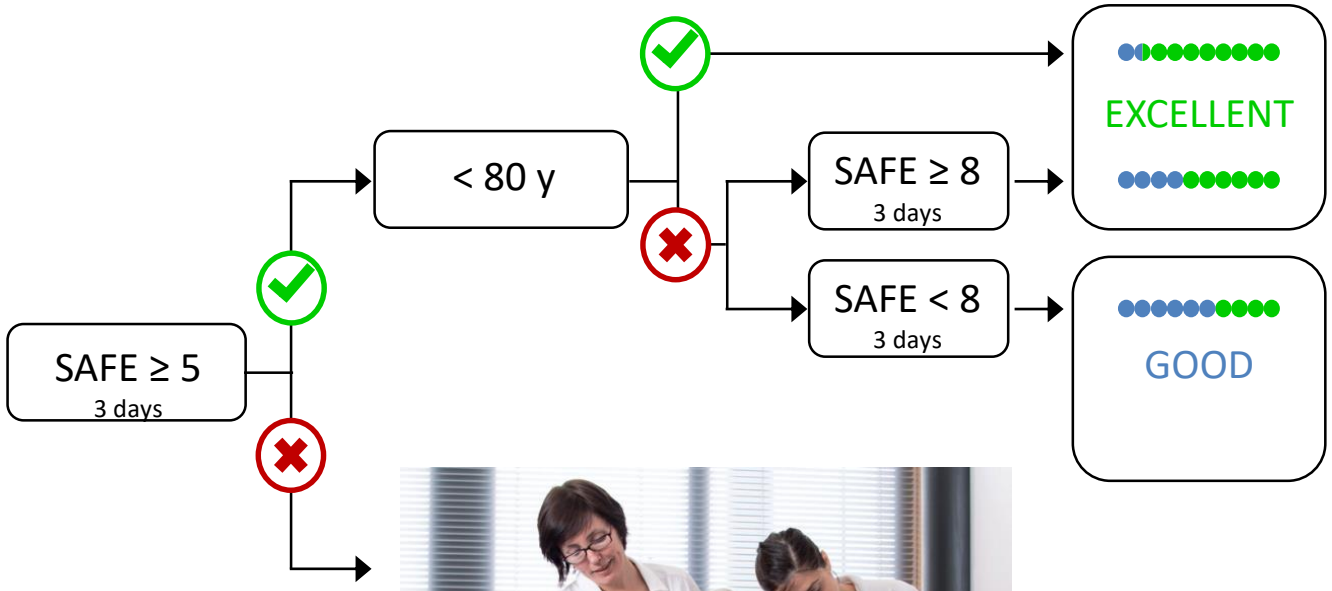
Welcome

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

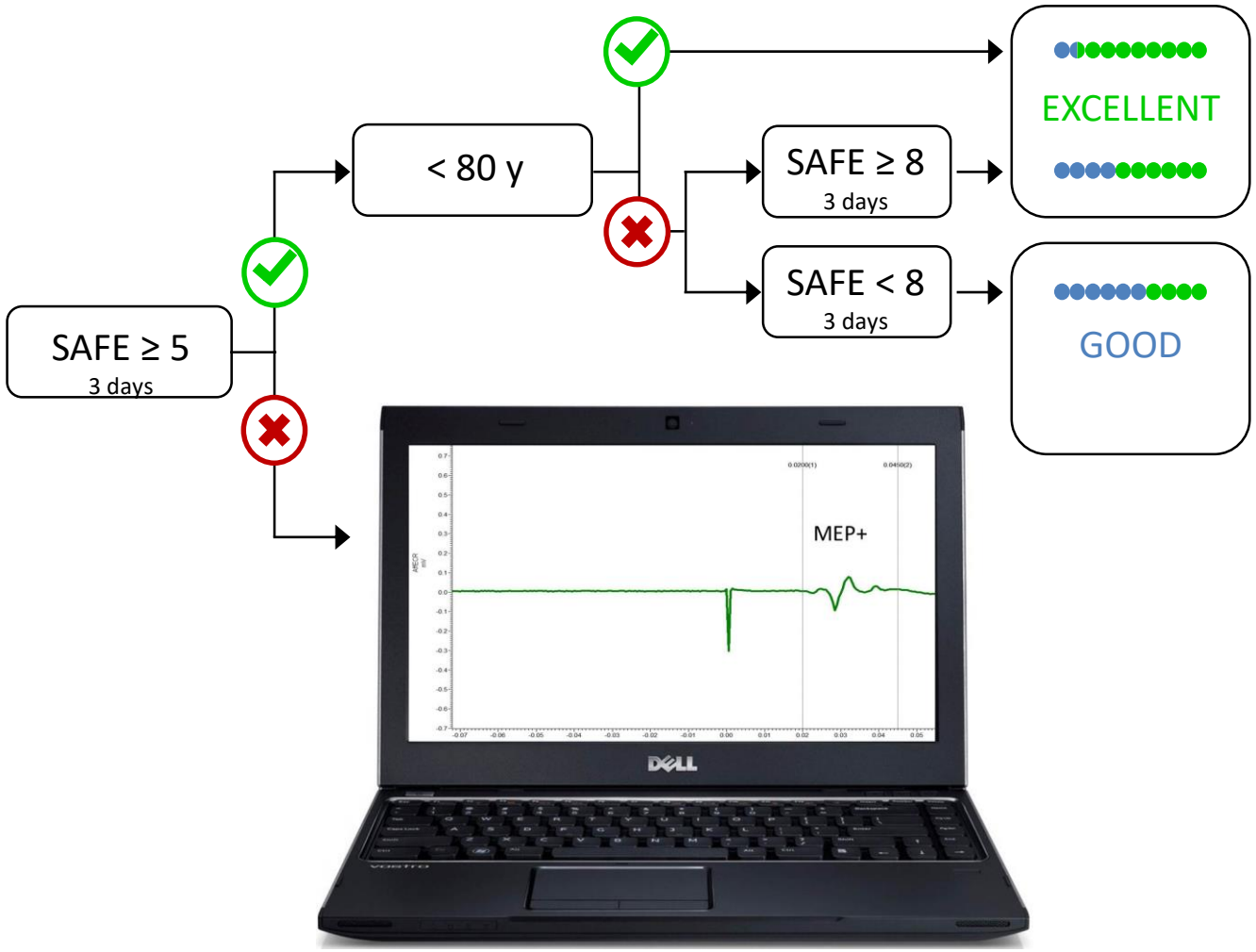
PREP2 algorithm



PREP2 algorithm



PREP2 algorithm



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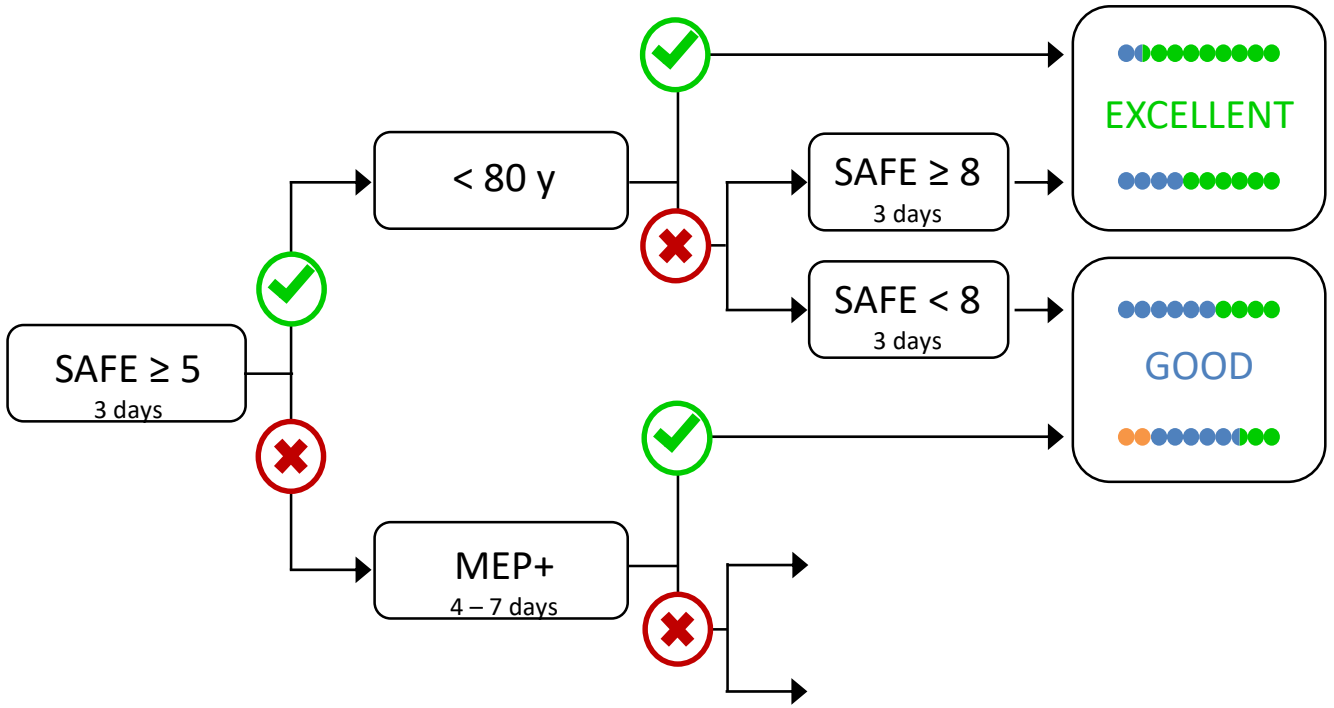

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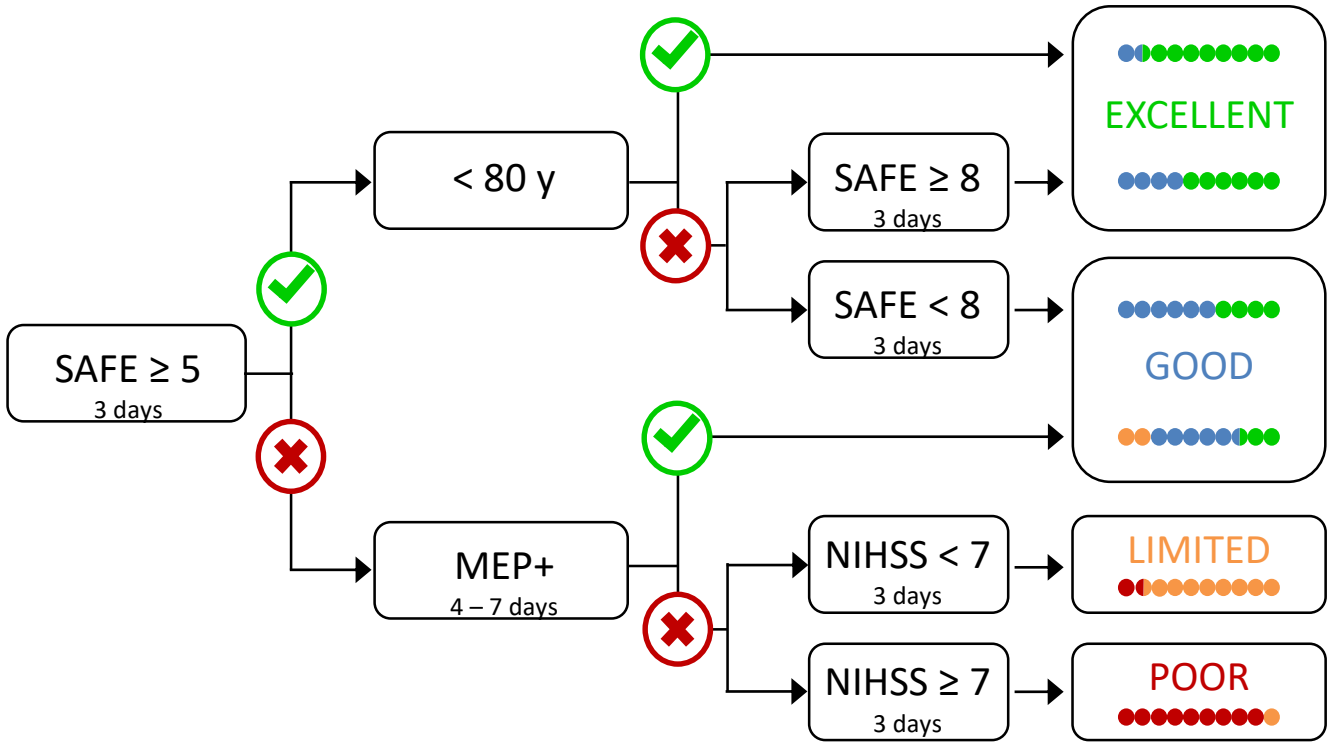


Accurate for 75% of patients

PREP2 algorithm

Excellent	Use hand and arm in usual daily activities
Good	Use hand and arm in usual daily activities Limited by slowness and clumsiness
Limited	May get return of some hand movement Unlikely to get fine motor control May need to use both arms to achieve some functional tasks
Poor	No functional use of the hand and arm May get limited return of movement proximally, but not the hand

PREP2 in the real world

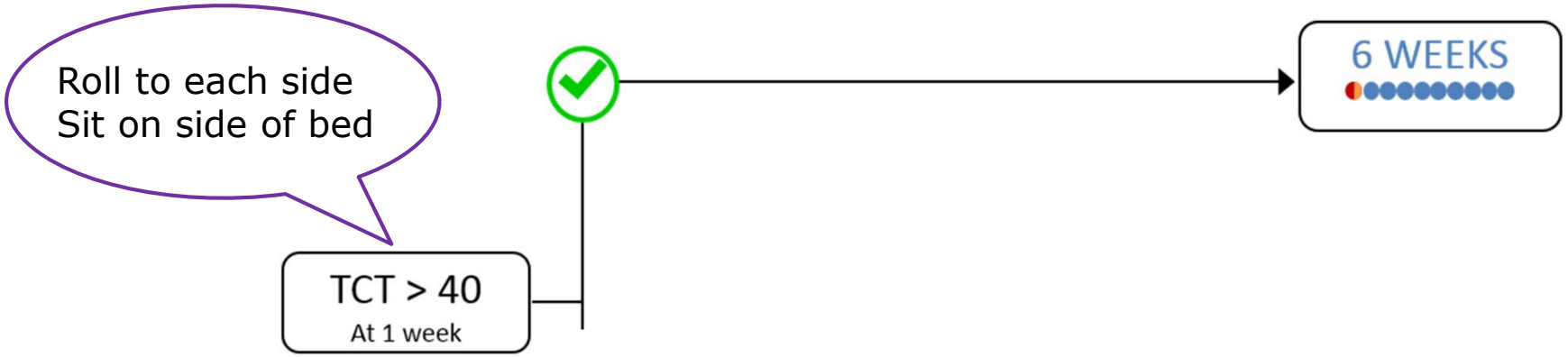
PREP2 is now routine clinical care at Auckland and Waitemata DHBs

This means:

- Patients will be discharged into the care of their GP with PREP2 information about their likely hand and arm recovery
- GPs likely to see the patient both during and after the 3 month period
- GPs can help support the patient with this information – consistency is important!

PREP2 is also being implemented at Waikato DHB and several other DHBs have expressed interest

TWIST algorithm

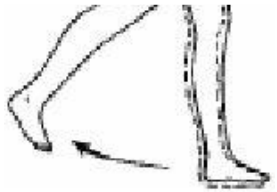


Accuracy
Overall 95%

91% (21/23)

100% (4/4)

100% (14/14)



Smith et al., Neurorehabilitation and Neural Repair, 2017

TWIST

We are validating TWIST in a larger group of patients and at different hospitals

- Including memory, thinking, visuospatial inattention, sensory loss and height/weight as additional potential predictors
- Re-checking whether tests of the motor pathways to the leg are useful biomarkers for independent walking
- Does the algorithm perform better than therapist predictions?

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 – more detail on this in the workshop
- Walking prediction is a work in progress – TWIST validation study is underway

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