

MRI Service Manual

2023: Version 16



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Service Overview

During 2017, ACC and the Northern Consortium worked in partnership to test the idea that High Tech Imaging (HTI) could be safely requested by General Practice, and that with the support of clinical guidelines, we could expedite clients getting the necessary and appropriate health intervention to recovery from musculoskeletal injuries.

Through collaborative co-design the pathway and enablers for this model have been developed, tested and refined since the project was initiated in February 2017. Interim results indicate that:

- the time to definitive diagnosis for clients requiring and MRI for a shoulder, knee or back injury has been reduced by an average of 16 working days
- a 'First Specialist Appointment' is avoided, and
- a proportion of clients are no longer referred to a specialist for further assessment after diagnosis

Based on the success of the 2017 POC in Auckland, ACC would like to implement HTI referrals direct from General Practice to:

- a greater number of GPs in the Auckland region, and
- additional PHOs within New Zealand

We will support this through:

- Continued clinical audit and governance
- A robust quality assurance framework
- Providing support to improve the health literacy of clients

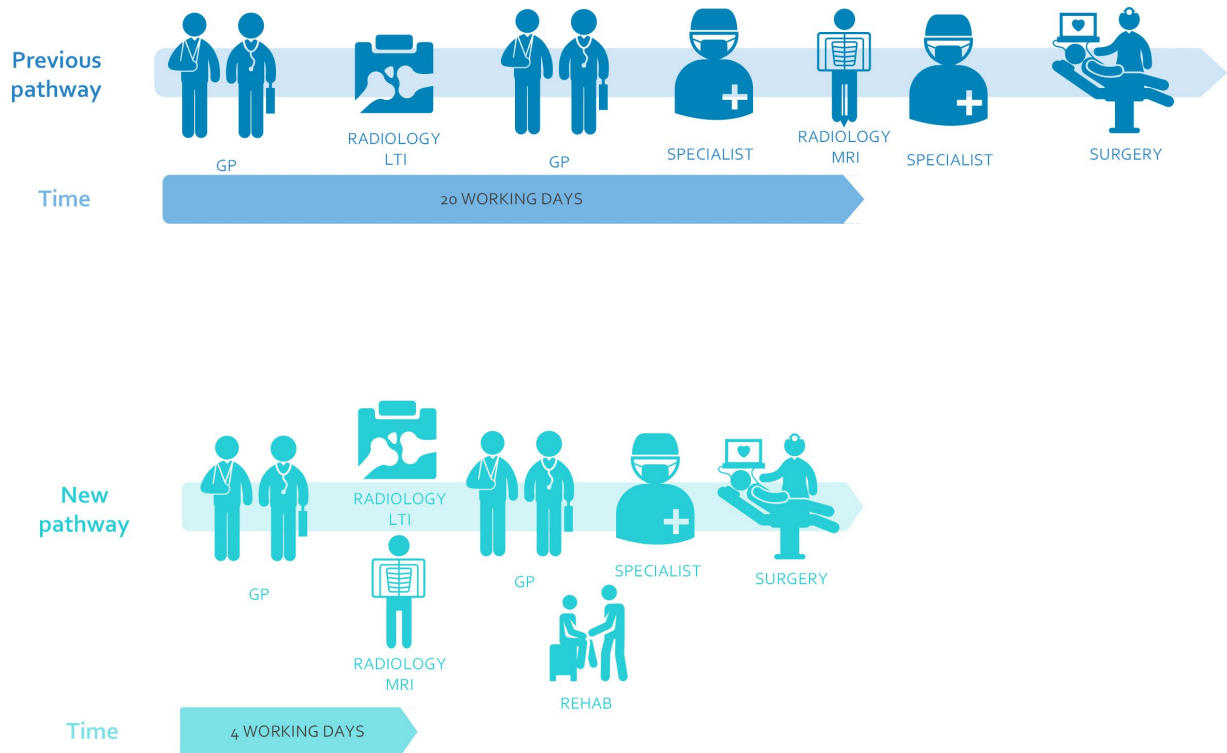
In 2021, ACC has contracted ProCare to utilise the same referral pathway in general practices across the regions nationally in partnership with Pinnacle Midlands Health Network. This new contract has been amended to reflect following changes:

- Accreditation now at individual GP level (previously at practice level whereas one accredited GP enables the whole practice to use the pathway)
- Removal of shoulder option

Key Points

-  Direct referral from **primary care to radiology for MRI**
-  MRI ordering of **knee, shoulder and spine** (cervical and lumbar)
-  Client journey **centred care**
-  More **appropriate** and better-quality specialist referrals and making **best use** of clinical time
-  **Quality assurance** framework ensures **appropriate use of resources**
-  **Education** on musculoskeletal assessment is **essential**
-  **Utilisation** of clinical decision support **pathways and assessments**

What is different in the pathway?



Clinical Pathways

The four clinical pathways used in the High-Tech Imaging (HTI) Client Pathway pilot have been adapted for primary care from the current ACC Guidelines and the New South Wales Primary Care Guidelines with collaboration from GPs, ACC, Mercy Radiologists and sports specialists.

The pathways have been refined with general practice during the pilot and this service handbook contains the latest version of the clinical pathways updated in 2021. The most up to date pathways will be included on the MRI referral form.

The High-Tech Imaging (HTI) clinical pathways are limited to:

- Cervical Spine Injury
- Lumbar Spine Injury
- Post Traumatic Knee Pain

KEY

- Assessment Guide
- Management Plan

- MRI CONTRAINDICATIONS**
- Pacemaker
- CAUTIONS - CONTACT RADIOLOGY PROVIDER**
- Metalware
 - Cochlear Implants
 - Claustrophobia
 - Works with Metal – Orbit check

***LUMBAR SPINE INJURY**

Clinical Assessment

NO Red Flags

Manage per acute clinical management pathways and guidelines as per references above.

Red Flags – URGENT Referral
Features of Cauda Equina Syndrome – urinary retention, faecal incontinence, widespread neurological symptoms and signs in the lower limb, including gait abnormality, saddle area numbness and a lax anal sphincter
Cauda Equina Syndrome is a medical emergency and requires urgent hospital referral
Infection – Fever plus source of infection, recent surgery, steroids, IV drug use, immunocompromised
Abdominal Aortic Aneurysm
NON URGENT Referral (if fails to improve)
Cancer – History of cancer or strong clinical suspicion
Fracture – Combination of female, over 70 years, steroid use, significant trauma for age and skin abrasion
Spondyloarthropathy – ACR guidelines

Persistent pain 6 weeks post injury that has shown no improvement following initial presentation

BACK DOMINANT PAIN

LEG DOMINANT PAIN

Nociceptive
A) Lower Back Pain; Pain located around spine only.
B) Somatic Referred Back Pain; Pain a dull ache, gnawing. Refers generally to buttock and posterior upper thigh, rarely below the knee. Pain location does not alter once established.

C) Radicular Pain

- Lancing nerve pain radiating down the leg within a narrow confine. Patient uncomfortable at night with this pain.
- +ve SLR / +ve Slump test
- +ve Femoral nerve stretch test (L2/3)

D) Radiculopathy
 Neurological abnormalities consistent with dermatomal or myotomal nerve root distribution +/- reflex abnormalities
 Abnormal neurological exam

X-Ray only if clinical concern regarding pathology

Manage as per local pathways
 Pain Management/
 Active Rehabilitation

MRI

NOT CONFIRMED

MRI

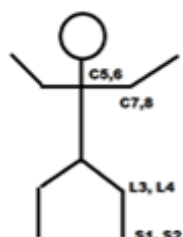
CONFIRMED
 Nerve root involvement

Manage as per local pathways
 Pain Management/
 Active Rehabilitation

CONFIRMED
 Nerve root compression

Refer Specialist

Refer Specialist



Nerve	Manual Muscle Testing	Nerve	Dermatome Site
L2/L3	Hip flexion	L2	Lateral aspect upper thigh anteriorly
L3/L4	Knee extension	L3	Medial thigh anteriorly above knee
L4/L5	Ankle dorsiflexion	L4	Medial side of the lower leg or ankle
L5/S1	Ankle plantarflexion	L5	1st web space
L5	Great toe extension	S1	Lateral aspect of the foot
		S2	Posterior aspect calf or thigh in the midline

SLR = Straight Leg Raise Test: positive <70° with high sensitivity. Limited by leg pain and not back pain.

KEY

Assessment Guide

Management Plan

MRI CONTRAINDICATIONS

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***CERVICAL SPINE INJURY**

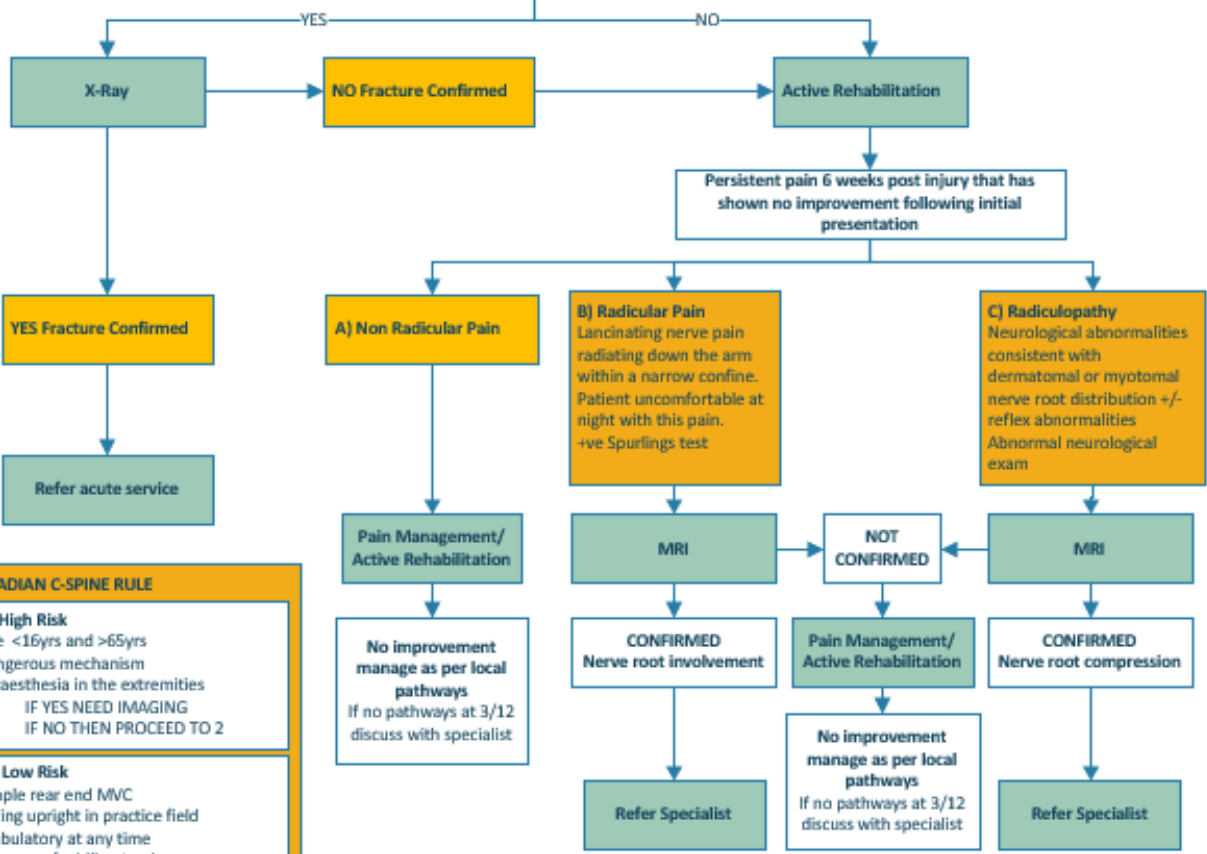
Clinical Assessment

NO Red Flags

Canadian C-Spine Rule

Red Flags – URGENT Consider other diagnoses

1. Severe worsening/unrelenting pain, especially at night or when lying down
2. Significant trauma
3. Weight loss, history of cancer, fever
4. Use of intravenous drugs or steroids
5. Bilateral signs and symptoms
6. Severe neurological dysfunction

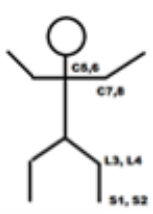


CANADIAN C-SPINE RULE

- 1. High Risk**
Age <16yrs and >65yrs
Dangerous mechanism
Paraesthesia in the extremities
IF YES NEED IMAGING
IF NO THEN PROCEED TO 2
- 2. Low Risk**
Simple rear end MVC
Sitting upright in practice field
Ambulatory at any time
Absence of midline tenderness
IF NO THEN NEEDS IMAGING
IF YES THEN PROCEED TO 3
- 3. Able to actively rotate neck > 45° to the left and the right & pain free flexion**
IF ABLE TO NO IMAGING NEEDED
IF NOT ABLE TO FOR IMAGING

NOTE: Canadian C-Spine Rule not applicable if

- Non-trauma case
- GCS<15
- Unstable vital signs
- Age <16 years
- Acute paralysis
- Known vertebral disease
- Previous C-Spine surgery



Nerve	Manual Muscle Testing	Nerve	Dermatome Site	Reflexes
C3		C3	Supraclavicular fossa	
C4	Shoulder elevation (shrug)	C4	Tip of the acromion	
C5	Deltoid – shoulder abduction	C5	Deltoid badge area	
C6	Biceps – elbow flexion Wrist flexion/extension	C6	Radial side of the thumb	Biceps
C7	Triceps – elbow extension Wrist flexion/extension	C7	Middle finger ventral aspect	Triceps
C8	Finger grip	C8	Ulnar side of 5 th digit ventrally	
T1	Finger abduction	T1	Medial aspect of the upper arm	

Spurlings Test
Good reliability when performed in the sitting position. High specificity but low sensitivity

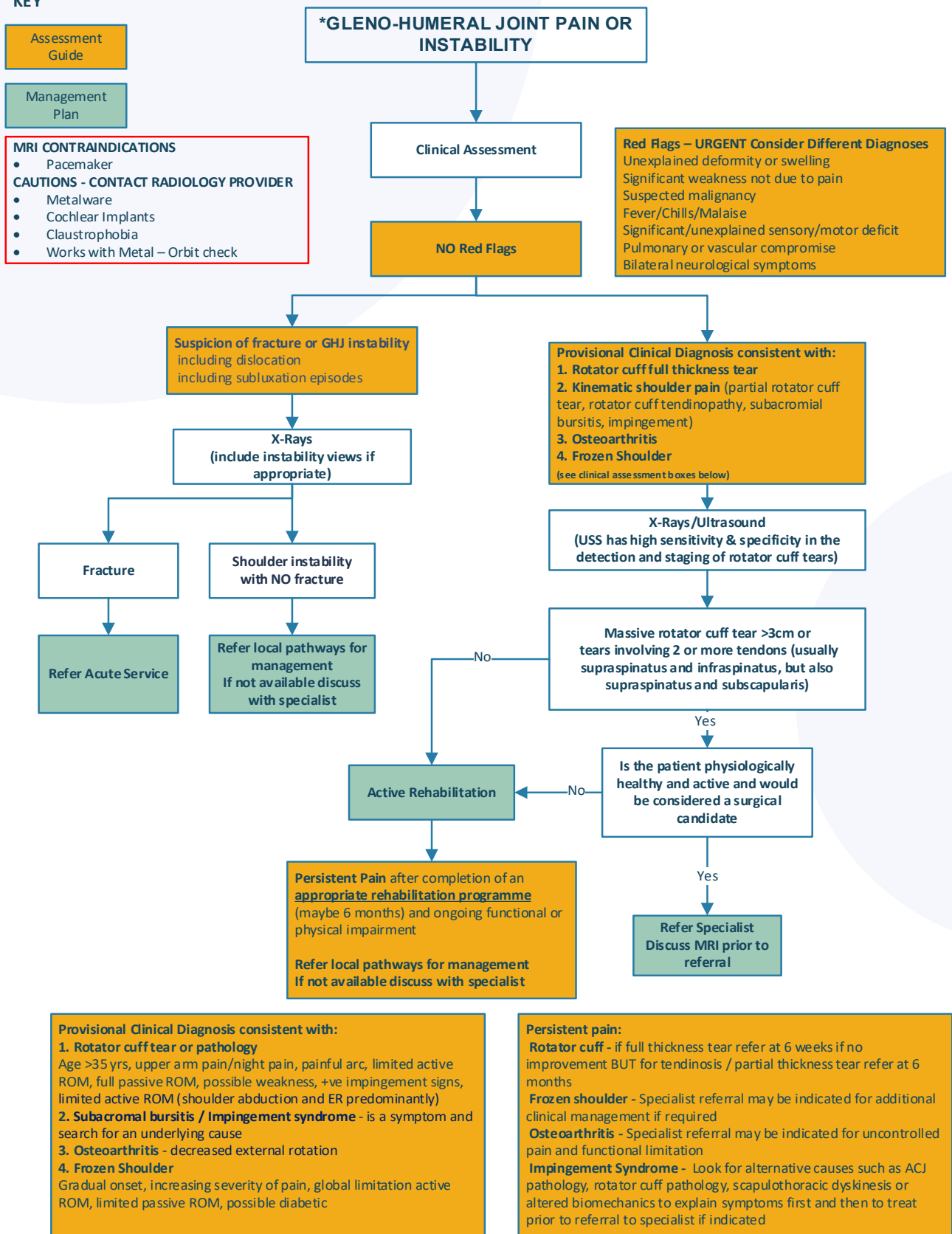
KEY

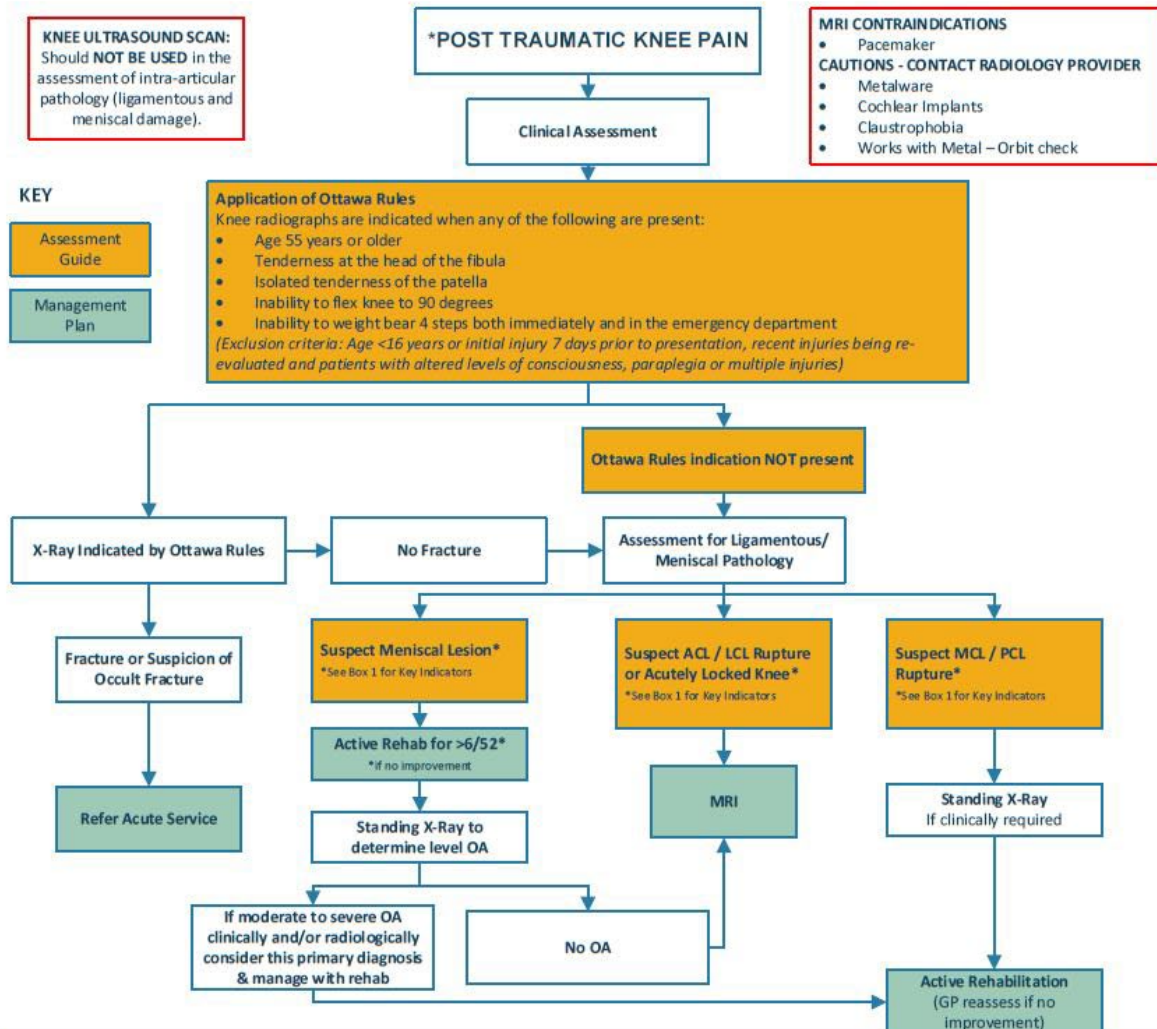
Assessment Guide

Management Plan

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- Red Flags – URGENT Consider Different Diagnoses**
- Unexplained deformity or swelling
 - Significant weakness not due to pain
 - Suspected malignancy
 - Fever/Chills/Malaise
 - Significant/unexplained sensory/motor deficit
 - Pulmonary or vascular compromise
 - Bilateral neurological symptoms





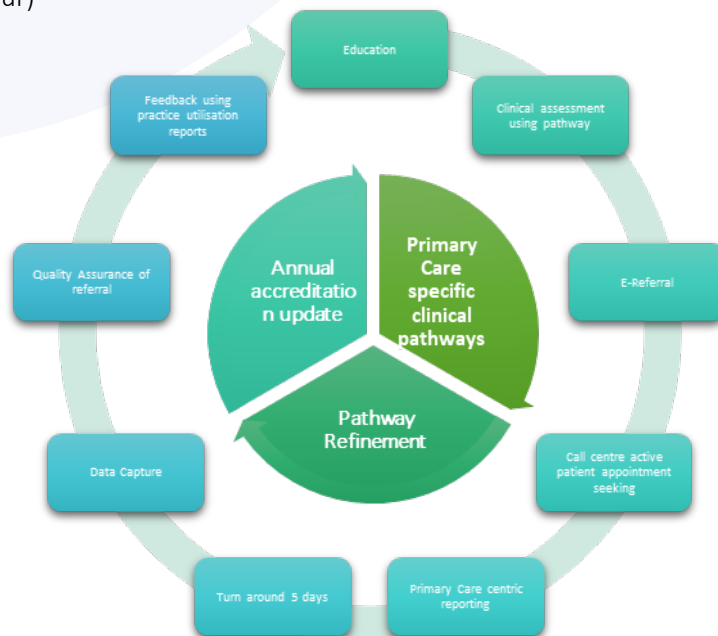
***BOX ONE:** Key factors in the history and clinical examination for the following conditions that would elicit an MRI referral under ligamentous and meniscal injuries:

- 1. Meniscal**
Injury mechanism – rotational element, squatting, cutting or twisting in younger population
Symptoms - Pain, swelling and mechanical symptoms (catching, locking)
Signs - Acutely locked knee, Effusion, joint line tenderness – posterior more clinically relevant (variable sensitivity 55 – 85% depending on site of meniscal pathology)
 Loss of end range extension or flexion
 Thessaly Test / McMurray's Test
- 2. Anterior Cruciate Ligament (ACL) Tear**
Injury mechanism – deceleration, change of direction on a fixed foot, rotational, twisting
Symptoms - Rapid onset of swelling within hours, Audible 'pop' or noise within the knee at the time of injury, Feeling of instability
Signs - Effusion often large within 2-3 hours
 Loss of end range extension
 Lachman's test positive (high sensitivity and high specificity)
 Anterior Draw test positive (high specificity and low sensitivity)
- 3. Posterior Cruciate Ligament (PCL) Tear**
Injury mechanism – posteriorly directed force to the proximal tibia (e.g. dashboard injury or fall onto flexed knee or tackle from the front)
Symptoms – Pain swelling and feeling of instability
Signs – Effusion, Posterior Draw test positive (high sensitivity), PCL sag sign (late sign)
- 4. Postero-Lateral Complex (PLC) Injury**
 Rare but associated with other ligamentous injuries in particular LCL rupture – needs referral
- 5. Medial Collateral Ligament (MCL) Injury**
Injury mechanism – valgus stress, often from a lateral force to the knee
Symptoms – Pain, swelling and feeling of instability
Signs – Effusion, Laxity on valgus stress test in 30° knee flexion, Laxity on valgus stress test in extension indicates higher degree of injury
- 6. Lateral Collateral Ligament (LCL) Injury**
 Rare in isolation
 Laxity on varus stress in extension and in 30° knee flexion

Quality Assurance

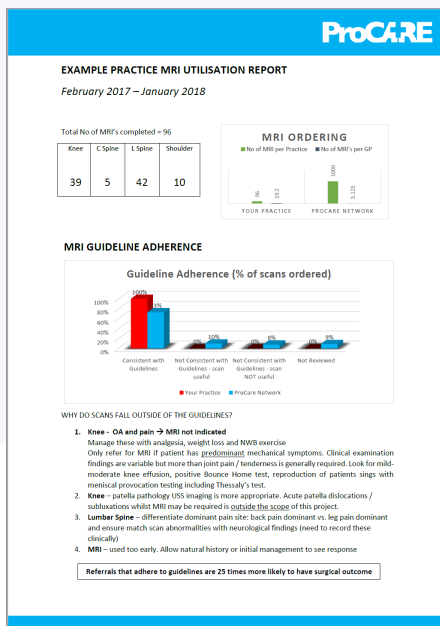
The ACC direct access for primary care to MRI is enabled by a quality assurance programme that has the following principles:

- Education that is general practice focused and decision support primary care clinical pathways
- Accreditation for GPs via the annual updates and participation in the quality assurance data collection of referral and clinical information that has associated 10 CQI points
- Data collection and analysis including referral and report data
- Feedback and benchmarking to practices, general practitioners and radiology providers via a utilisation report which is accredited for CPD points by the NZ College of GPs (see Appendix Four)



NZCGP CQI Audit Points

This utilisation report is approved by RNZCGP for CME points and is generated annually as part of the quality assurance programme.



SUMMARY SHEET
Audit of medical practice (CQI activity)

Topic: _____ Date: _____

Activity designed by (name of organisation, if relevant): _____

Doctor's name: _____

Results discussed with peer group or colleagues? Yes No Date: _____

FIRST CYCLE

DATA: Date of data collection: _____

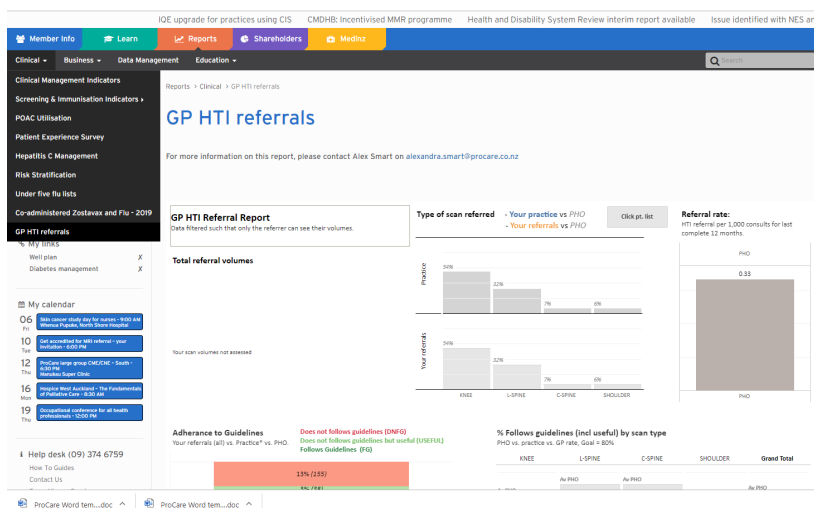
CHECK: Describe any areas targeted for improvement as a result of analysing the data collected. (If the findings have any implications for health equity, please include this.)

ACTION: Describe how these improvements will be implemented.

MONITOR: Describe how well the process is working. When will you undertake a second cycle?

Accessing the HTI GP Utilisation report for CQI point claiming

1. Login to the members website where this is hosted <https://members.procare.co.nz>
2. Click 'reports' from the top bar menu (normal reports area for clinical / reports)
3. Click 'Clinical' drop down and select 'GP HTI referrals'
4. To get the patient details click 'click pt list' button.



Education



To maintain accreditation for the service GP's need to complete a refresher annually. These all have CPD points associated. The refresher is currently the online course and one-night practical training.

The sessions are practical musculoskeletal assessment sessions led by sport specialists and sport physios. The assessment techniques useful in a GP setting are practiced, along with how to utilise the clinical pathways.

Online Education

The ACC MRI education programme is supported by a full online learning module which is available via the members website/LEARN section. Videos of all the examination and a breakdown of the clinical pathways are provided along with CME points. The online learning course can be accessed via the members website at <https://members.procare.co.nz>

The screenshot shows the ProCare members website dashboard. The 'Learn' tab is highlighted with a red circle and an arrow pointing to the 'MRI Musculoskeletal Assessment MRI' course card on the dashboard. To the right, a detailed view of the course shows the following modules:

- MRI SERVICE Introduction
- MRI SERVICE Background
- MRI SERVICE Module 1 Knee Injury
- MRI SERVICE Module 2 Shoulder Injury
- MRI SERVICE Module 3 L-Spine Injury
- MRI SERVICE Module 4 C-Spine Injury
- MRI SERVICE Course Completion

If you don't see the course on your dashboard as above then please contact aimee.wallace@procare.co.nz for enrolment.

MRI E-Referral User Guide

2023



MRI E-Referral User Guide

This MRI e-referral guide shows you how to order an MRI for an ACC injury client. The use of this form requires you to be accredited through the GP MRI accreditation programme. The contract to use this service with ACC requires the GP to maintain an above 70% compliance rate with the clinical pathway.

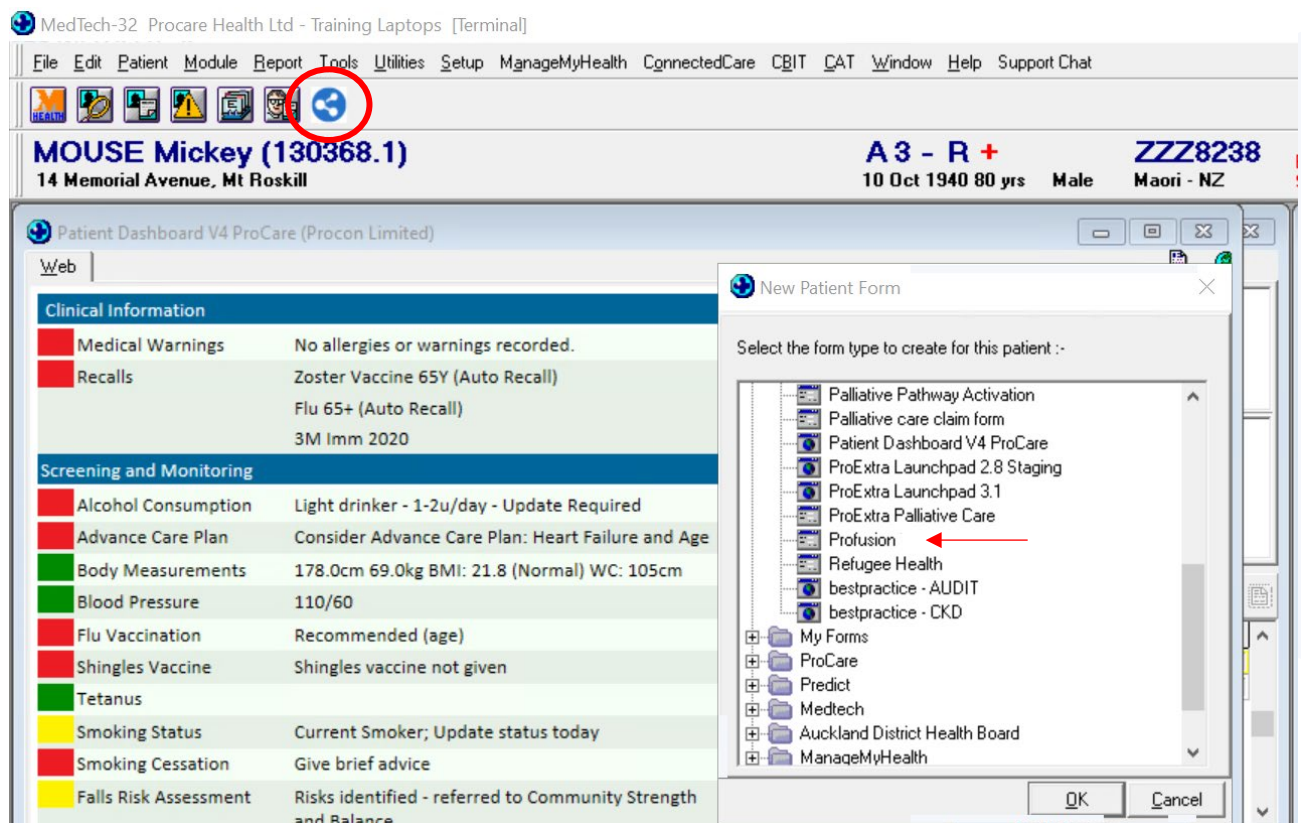
At the end of the guide there is a quick 'cheat sheet' to use as a reference.

Making a Referral

Step One

Press Shift + F3 and the new form tab will appear, select Profusion

OR click on the Profusion icon

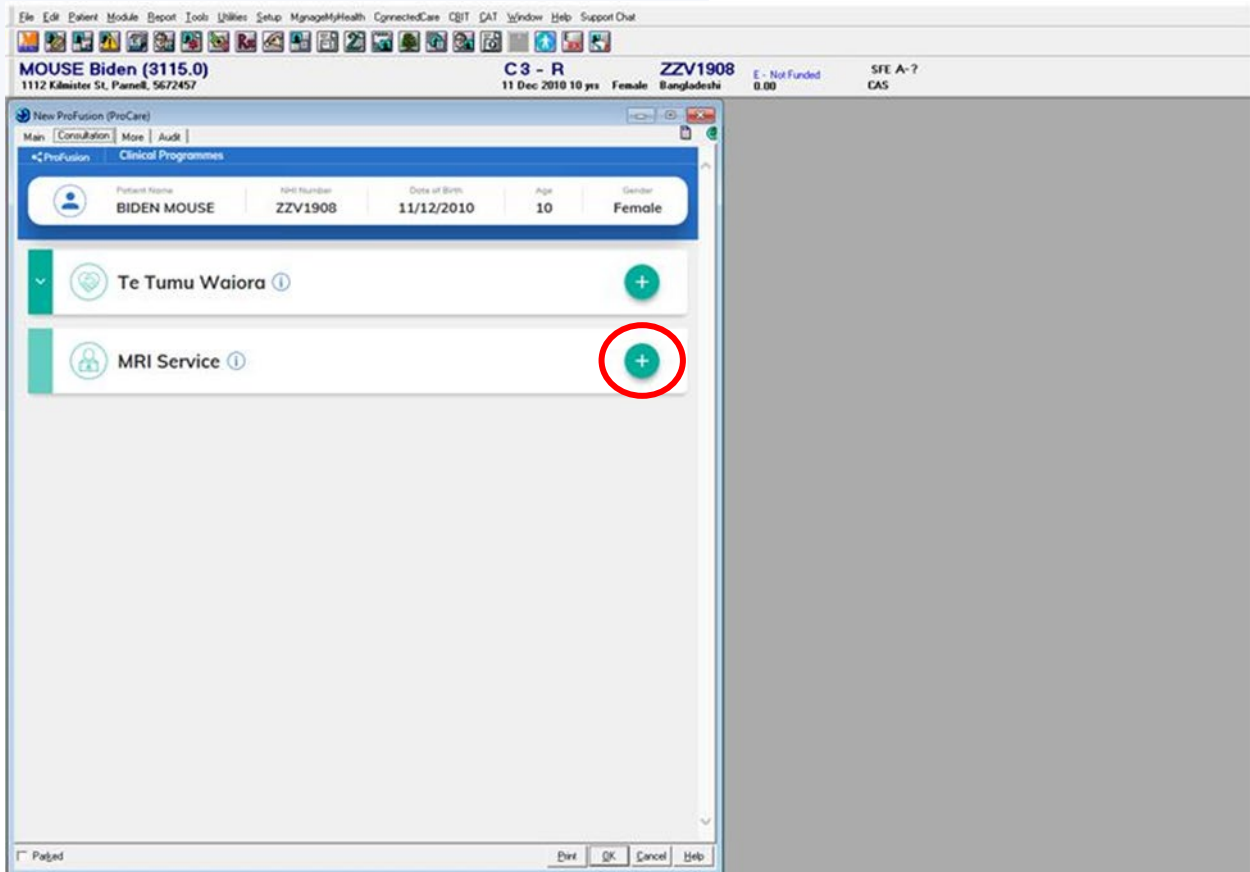



The screenshot shows the ProCare software interface. At the top, the menu bar includes 'File', 'Edit', 'Patient', 'Module', 'Report', 'Tools', 'Utilities', 'Setup', 'ManageMyHealth', 'ConnectedCare', 'CBIT', 'CAT', 'Window', 'Help', and 'Support Chat'. Below the menu bar, the patient information for 'MOUSE Mickey (130368.1)' is displayed, including '14 Memorial Avenue, Mt Roskill', 'A3 - R +', '10 Oct 1940 80 yrs', 'Male', and 'Maori - NZ'. The 'ZZZ8238' ID is also visible. The main area shows the 'Patient Dashboard V4 ProCare (Procon Limited)' with a 'Web' tab. The dashboard is divided into 'Clinical Information' and 'Screening and Monitoring' sections. A 'New Patient Form' dialog box is open, showing a list of form types to select. The 'Profusion' form type is highlighted with a red arrow. The dialog box also includes 'OK' and 'Cancel' buttons.

Clinical Information	
Medical Warnings	No allergies or warnings recorded.
Recalls	Zoster Vaccine 65Y (Auto Recall) Flu 65+ (Auto Recall) 3M Imm 2020
Screening and Monitoring	
Alcohol Consumption	Light drinker - 1-2u/day - Update Required
Advance Care Plan	Consider Advance Care Plan: Heart Failure and Age
Body Measurements	178.0cm 69.0kg BMI: 21.8 (Normal) WC: 105cm
Blood Pressure	110/60
Flu Vaccination	Recommended (age)
Shingles Vaccine	Shingles vaccine not given
Tetanus	
Smoking Status	Current Smoker; Update status today
Smoking Cessation	Give brief advice
Falls Risk Assessment	Risks identified - referred to Community Strength and Balance

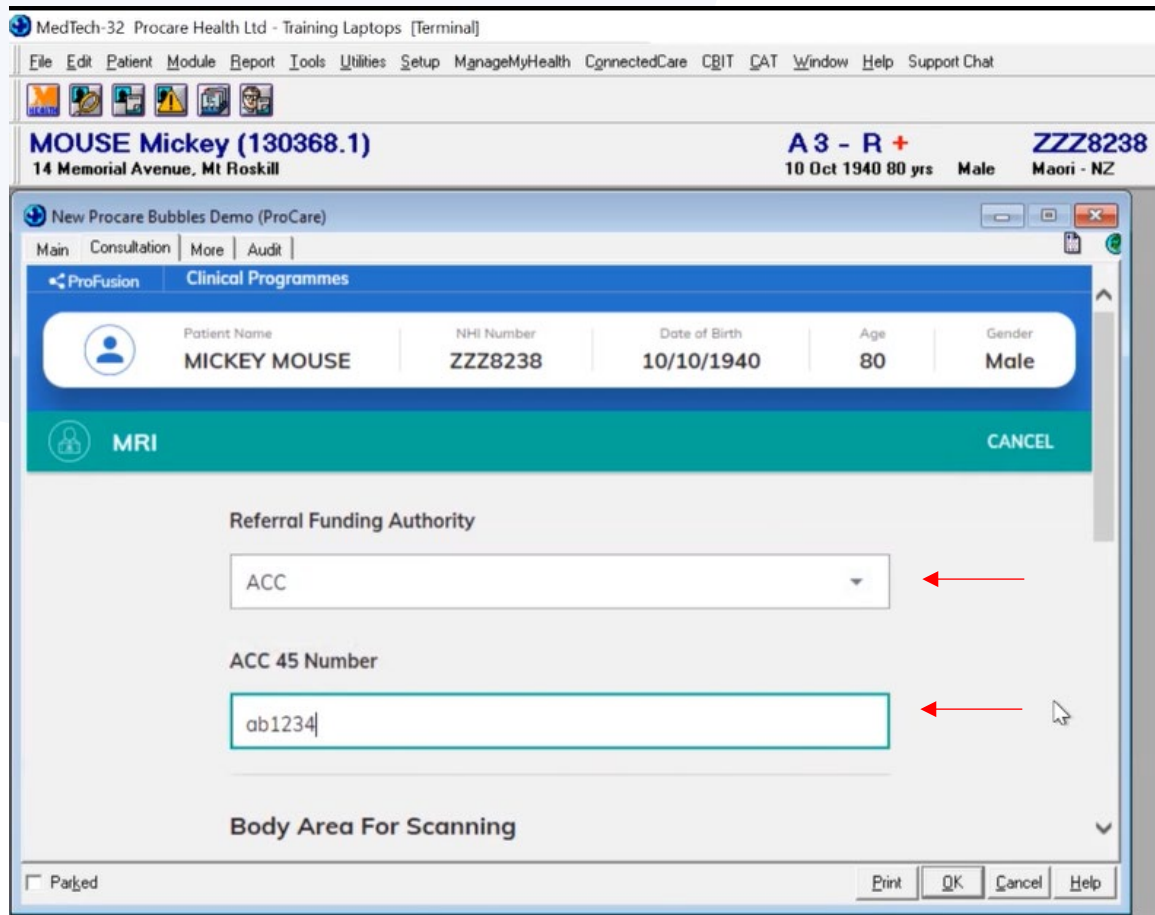
Step Two

Profusion form comes up, select the + to open up MRI service form



Step Three

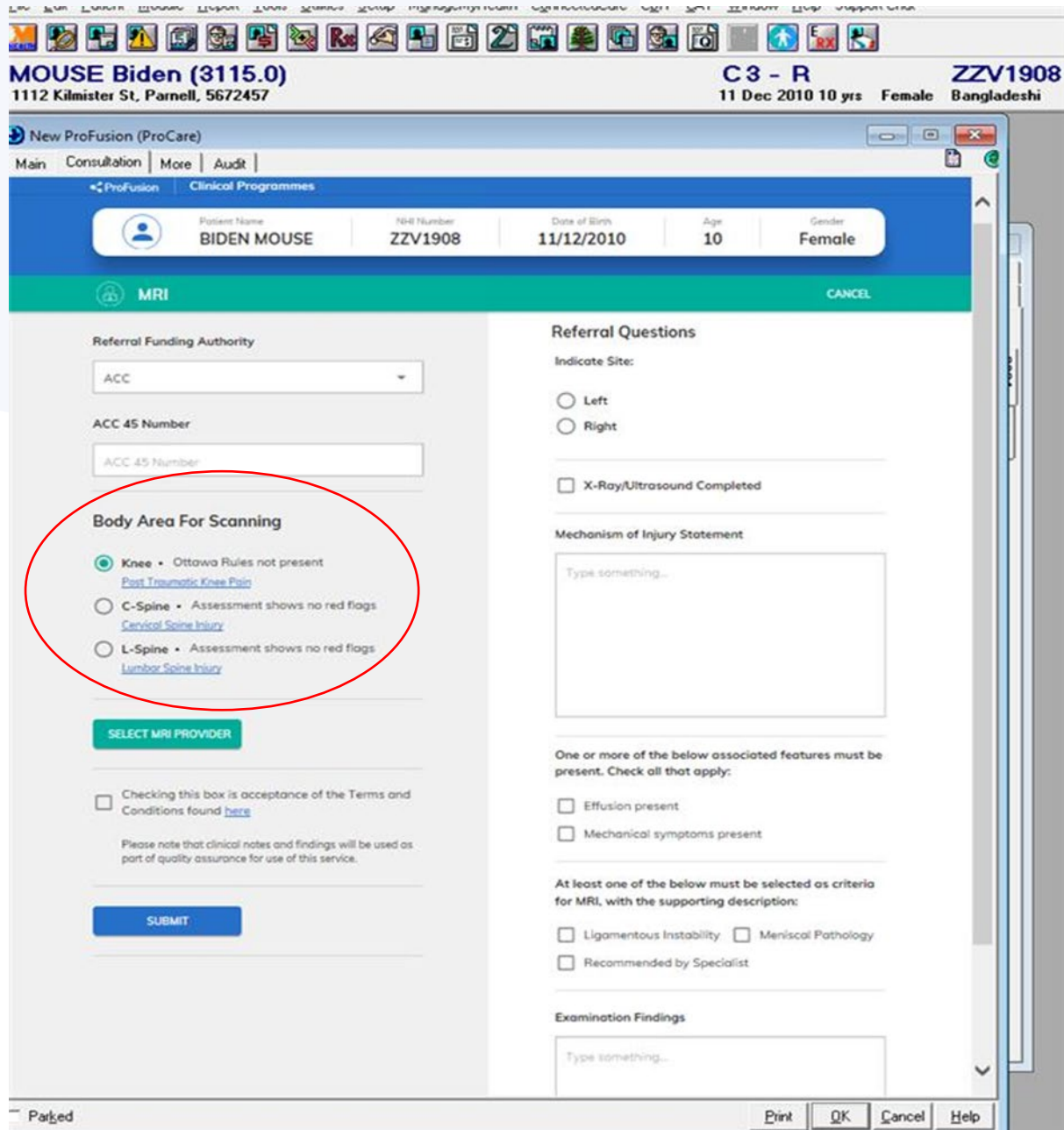
Select ACC and put in the ACC 45 number



The screenshot shows a ProCare software window titled "New Procare Bubbles Demo (ProCare)". The patient information at the top includes: **MOUSE Mickey (130368.1)**, **14 Memorial Avenue, Mt Roskill**, **A 3 - R +**, **10 Oct 1940 80 yrs**, **Male**, and **ZZZ8238**, **Maori - NZ**. The main form area is for an MRI scan. It features a patient summary bar with fields for Patient Name (MICKEY MOUSE), NHI Number (ZZZ8238), Date of Birth (10/10/1940), Age (80), and Gender (Male). Below this is a green bar labeled "MRI" with a "CANCEL" button. The "Referral Funding Authority" field is a dropdown menu currently set to "ACC", with a red arrow pointing to it. The "ACC 45 Number" field contains the text "ab1234", with a red arrow pointing to it. The "Body Area For Scanning" field is currently empty. At the bottom of the form, there is a "Print" button, a "Parked" checkbox, and buttons for "OK", "Cancel", and "Help".

Step Four

Select body type



MOUSE Biden (3115.0)
1112 Kilmister St, Parnell, 5672457

C3 - R
11 Dec 2010 10 yrs Female Bangladeshi

ZZV1908

New ProFusion (ProCare)

Main Consultation More Audit

ProFusion Clinical Programmes

Patient Name: BIDEN MOUSE
NHI Number: ZZV1908
Date of Birth: 11/12/2010
Age: 10
Gender: Female

MRI CANCEL

Referral Funding Authority: ACC

ACC 45 Number: ACC 45 Number

Body Area For Scanning

- Knee** • Ottawa Rules not present
[Post Traumatic Knee Pain](#)
- C-Spine** • Assessment shows no red flags
[Cervical Spine Injury](#)
- L-Spine** • Assessment shows no red flags
[Lumbar Spine Injury](#)

SELECT MRI PROVIDER

Checking this box is acceptance of the Terms and Conditions found [here](#)

Please note that clinical notes and findings will be used as part of quality assurance for use of this service.

SUBMIT

Referral Questions

Indicate Site:

- Left
- Right

X-Ray/Ultrasound Completed

Mechanism of Injury Statement

Type something...

One or more of the below associated features must be present. Check all that apply:

- Effusion present
- Mechanical symptoms present

At least one of the below must be selected as criteria for MRI, with the supporting description:

- Ligamentous Instability
- Meniscal Pathology
- Recommended by Specialist

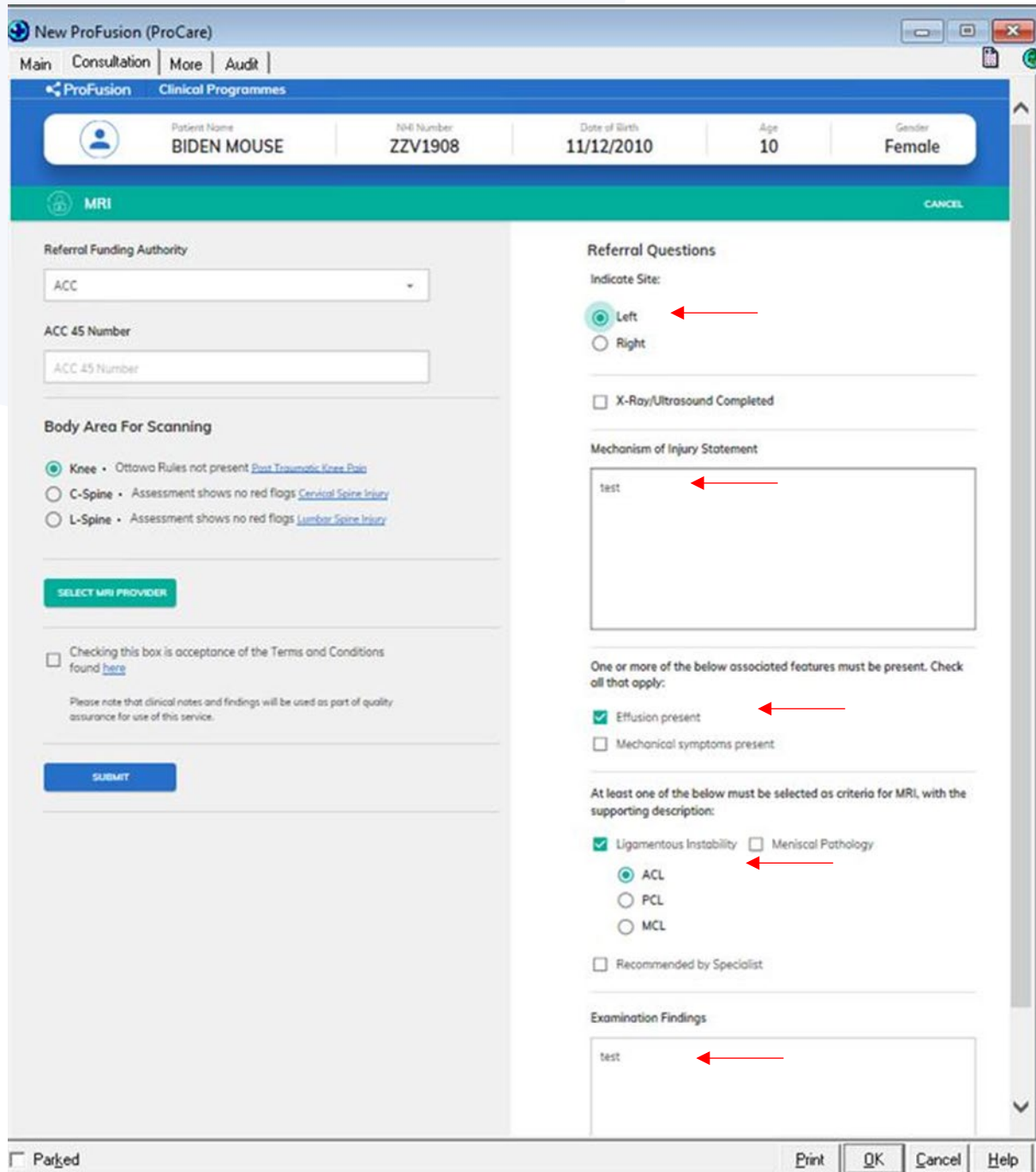
Examination Findings

Type something...

Parked Print QK Cancel Help

Step Five

Put in referral info



New ProFusion (ProCare)

Main | Consultation | More | Audit

ProFusion Clinical Programmes

Patient Name: **BIDEN MOUSE** | NH Number: **ZZV1908** | Date of Birth: **11/12/2010** | Age: **10** | Gender: **Female**

MRI [CANCEL]

Referral Funding Authority: ACC

ACC 45 Number: ACC 45 Number

Body Area For Scanning

- Knee • Ottawa Rules not present [Post Traumatic Knee Pain](#)
- C-Spine • Assessment shows no red flags [Cervical Spine Injury](#)
- L-Spine • Assessment shows no red flags [Lumbar Spine Injury](#)

[SELECT MRI PROVIDER]

Checking this box is acceptance of the Terms and Conditions found [here](#)

Please note that clinical notes and findings will be used as part of quality assurance for use of this service.

[SUBMIT]

Referral Questions

Indicate Site:

- Left
- Right

X-Ray/Ultrasound Completed

Mechanism of Injury Statement

test

One or more of the below associated features must be present. Check all that apply:

- Effusion present
- Mechanical symptoms present

At least one of the below must be selected as criteria for MRI, with the supporting description:

- Ligamentous Instability
 - ACL
 - PCL
 - MCL
- Meniscal Pathology
- Recommended by Specialist

Examination Findings

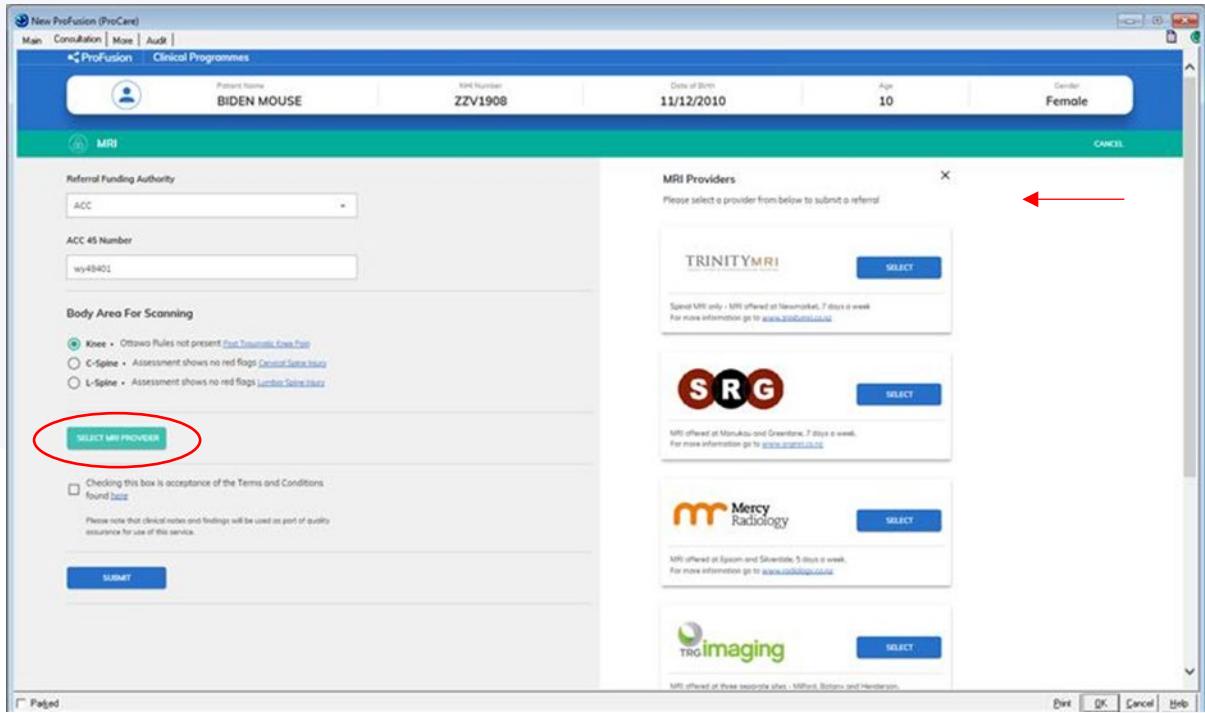
test

[Print] [OK] [Cancel] [Help]

Paired

Step Six

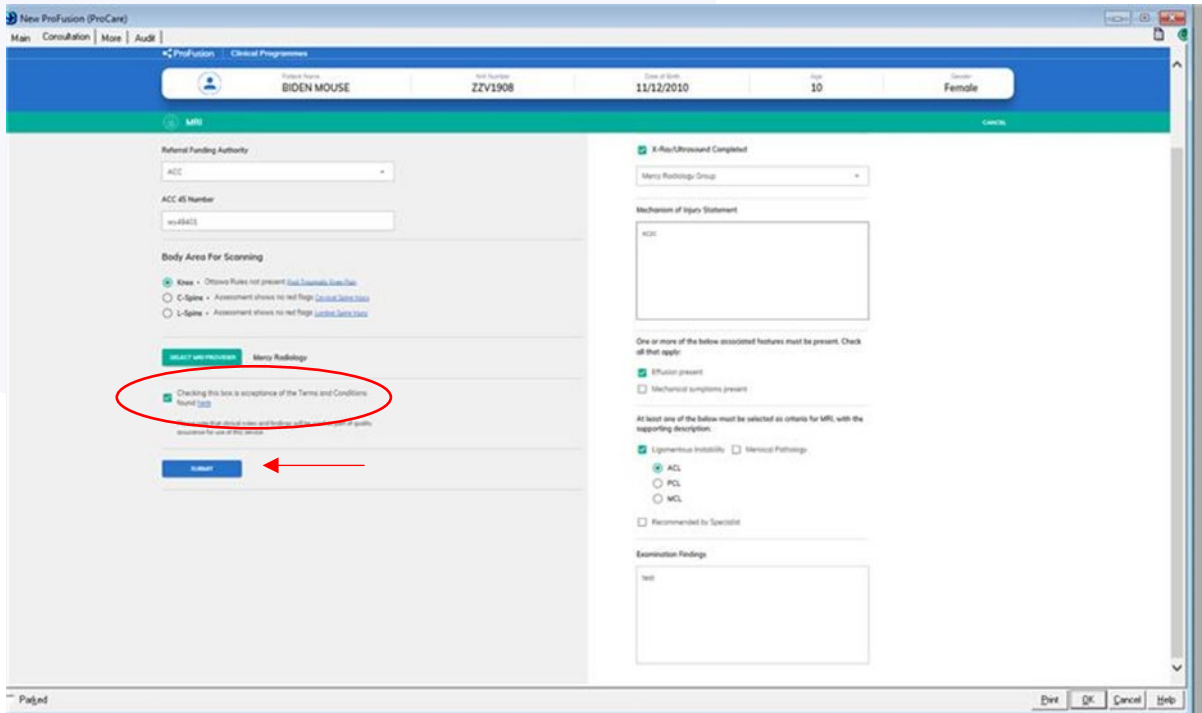
Select MRI provider and the list of radiology options for referral will pop up.



The screenshot displays the 'New ProFusion (ProCare)' interface. At the top, there are navigation tabs: 'Main', 'Consultation', 'More', and 'Audit'. Below this is a header for 'ProFusion Clinical Programmes' with a patient profile for BIDEN MOUSE, including MRN ZZV1908, DOB 11/12/2010, Age 10, and Gender Female. The 'MRI' section is highlighted in green. On the left, there are fields for 'Referral Funding Authority' (ACC), 'ACC 45 Number' (WY49401), and 'Body Area For Scanning' (Knee, C-Spine, L-Spine). A 'SELECT MRI PROVIDER' button is circled in red. Below this is a checkbox for 'Checking this box is acceptance of the Terms and Conditions found here'. A 'SUBMIT' button is at the bottom left. On the right, a modal window titled 'MRI Providers' is open, showing a list of providers with 'SELECT' buttons: TRINITYMRI, SRG, Mercy Radiology, and TRC imaging. A red arrow points to the 'SELECT MRI PROVIDER' button in the main form.

Step Seven

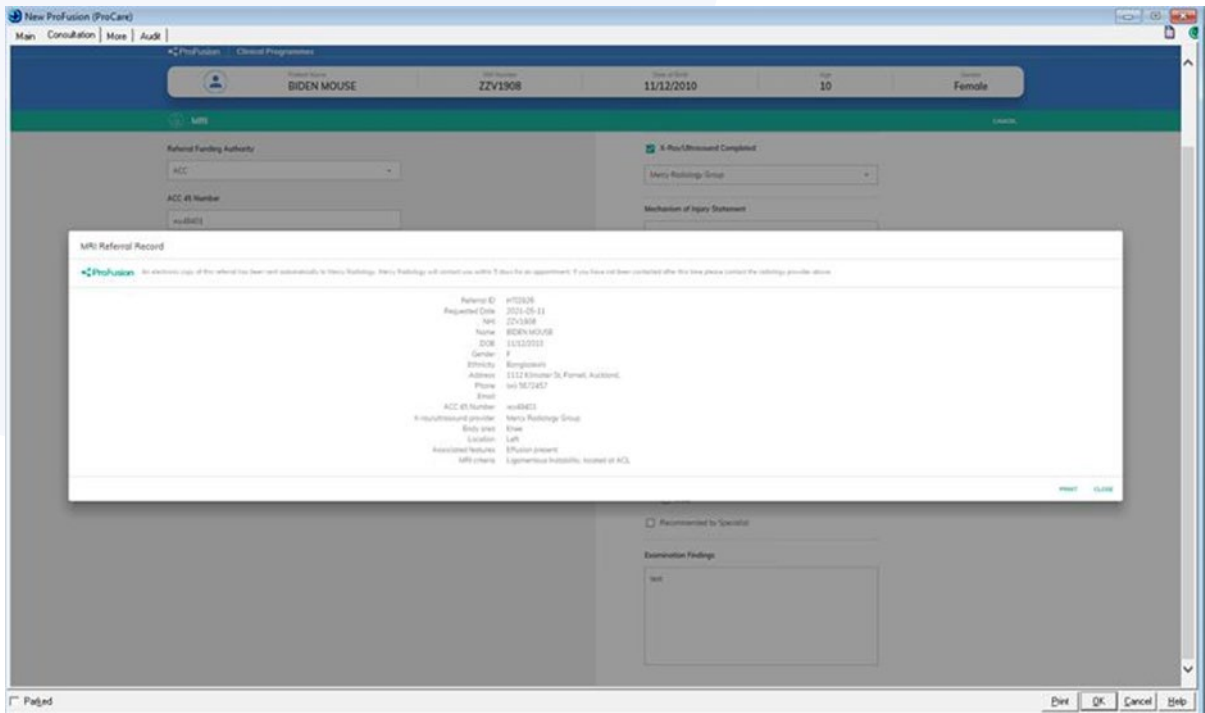
Tick the Terms and Conditions before submitting, then click Submit



The screenshot shows the 'New Profusion (ProCare)' interface for a patient named BIDEN MOUSE. The patient's details are: Referral Number ZZV1908, Date of Birth 11/12/2010, Age 10, and Gender Female. The form is for an MRI scan. The 'Referral Funding Authority' is set to 'ACC'. The 'ACC #5 Number' is '1049441'. Under 'Body Area For Scanning', 'Knee' is selected. A red circle highlights the checkbox 'Checking this box is acceptance of the Terms and Conditions', which is currently checked. A red arrow points to the 'Submit' button. The right side of the form contains sections for 'X-Ray/Ultrasound Completed', 'Mechanism of Injury Statement', 'One or more of the below associated features must be present', 'At least one of the below must be selected as criteria for MRI', and 'Examination Findings'.

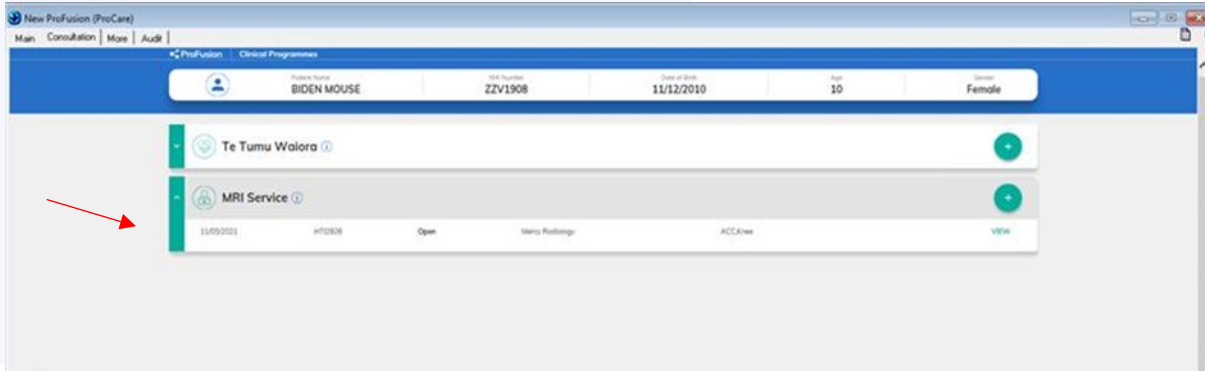
Step Eight

Referral record will pop up and say referral successful (this can be printed for patient to take home if they want a copy)

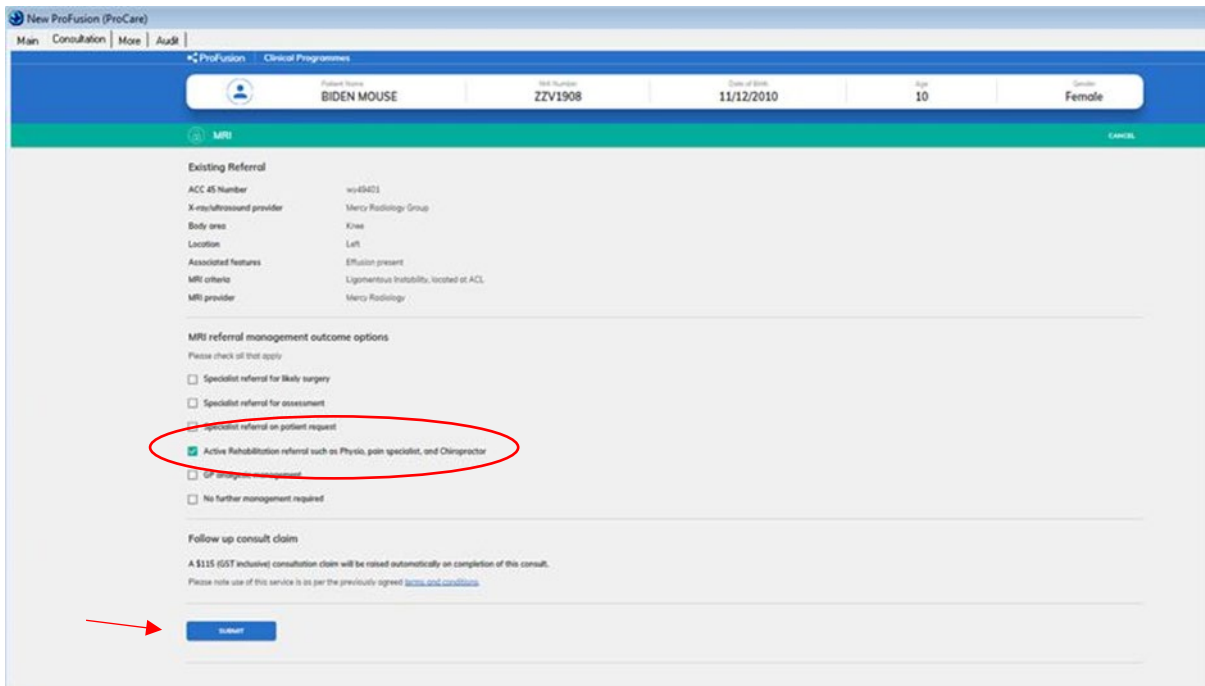


Submitting Outcome and Claiming

1. Go back to the Profusion form per above
2. Click on the dropdown and the previous open referrals will appear
3. Select the patient






4. Select outcome and submit claim



MRI Ordering Cheat Sheet

MRI Ordering Cheat Sheet Your form for ordering has now been installed on your PMS. Please contact [Help Desk \(09\) 374 6759 option 1](#) for support if you need assistance with using the form.

MRI Referral Steps

	MedTech	MyPractice	Indici
STEP 1	Shift F3	Shift F2	Select the patient and open the patient record
STEP 2	Click on 'ProCare Services' OR select Profusion icon 	Click on 'Clinical Notes' Click 'Forms' Click on 'ProCare Services' OR select Profusion icon 	Select Profusion icon 
STEP 3	Fill in ACC Number and X-Ray details	Fill in ACC Number and X-Ray details	Fill in ACC Number and X-Ray details
STEP 4	Then select body site and the relevant screen will show	Then select body site and the relevant screen will show	Then select body site and the relevant screen will show
STEP 5	Fill in information and submit request (Note: The referral is automatically sent to the selected Radiology provider for MRI referral). This is saved to the Patient Inbox.	Fill in information and submit request (Note: The referral is automatically sent to the selected Radiology for MRI referral). This is saved to the 'Notes' and 'Results' tab	Fill in information and submit request (Note: The referral is automatically sent to the selected Radiology for MRI referral). This is saved in the patient outbox and timeline.
STEP 6	The voucher will appear. Click print on the voucher and give a copy to patient.	The voucher will appear. Click print on the voucher and give a copy to patient.	The voucher will appear. Click print on the voucher and give a copy to patient.

MRI Follow-up Consultation Steps

	MedTech	MyPractice	Indici
STEP 1	Open Patient in PMS, reopen advanced form and follow-up consult form automatically appears, you need to be a GP to complete	Open Patient in PMS, reopen advanced form and follow-up consult form automatically appears, you need to be a GP to complete	Open Patient in PMS, reopen advanced form and follow-up consult form automatically appears, you need to be a GP to complete
STEP 2	Fill out information and record consult	Fill out information and record consult	Fill out information and record consult
STEP 3	The follow-up consult information claim is automatically sent to ProCare for processing. ProCare will raise a BCTI invoice automatically for the claim.	The follow-up consult information claim is automatically sent to ProCare for processing. ProCare will raise a BCTI invoice automatically for the claim.	The follow-up consult information claim is automatically sent to ProCare for processing. ProCare will raise a BCTI invoice automatically for the claim.