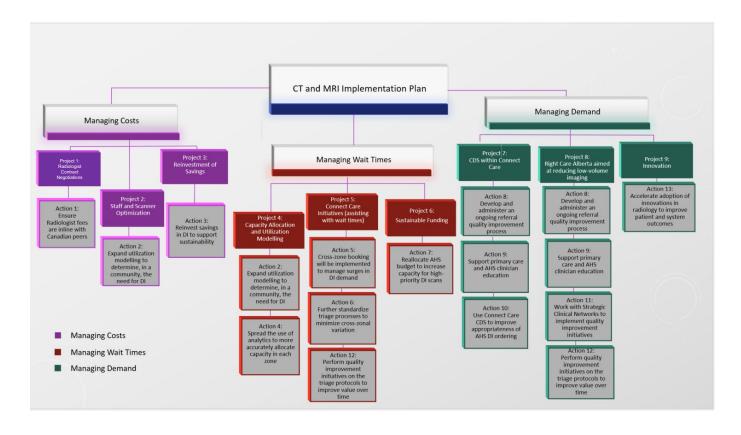# Diagnostic Imaging, CT and MRI Implementation Plan

RESPONSE TO DI ACTION PLAN: FOCUSING ON CT AND MRI

DIAGNOSTIC IMAGING PROVINCIAL EXECUTIVE TEAM (DIPET)

ALBERTA HEALTH SERVICES | Provincial Diagnostic Imaging Services

Revised March 26, 2021

Contents

CT and MR Implementation Plan, At a Glance

Introduction

The *DI Action Plan: Focusing on CT and MRI*, addresses and outlines steps to manage challenges over growing demand in CT and MR faced within Provincial Diagnostic Imaging today. In 2020, the wait times for CT and MR are at unacceptable levels and Alberta patients are waiting well beyond defined wait time targets. The CT and MR wait time trend shows that emergent patients in Alberta received their diagnostic exams within appropriate clinical wait time targets. Outpatients prioritized as semi-urgent and routine see consistently high wait times which are increasing in response to several contributing growth factors. There was also an increase in the wait times of the urgent patients to an unacceptable level over the last year. In short, increased demand for imaging is currently exceeding our budgeted capacity to perform the number of exams required within the province; therefore, patients are waiting for imaging beyond established clinical target wait times.

To mitigate the challenges we face will require a three prong approach; address rising costs, reduce growing demand and bring wait times to an acceptable level. This plan focuses efforts on managing the demand included appropriateness activities that are in progress, and ensuring imaging requests are tied to patient outcomes. Finding sustained funding opportunities, increasing educational efforts internally and externally, improving efficiencies, ensuring active clinical engagement, improved analytics and the establishment of a new information system, Connect Care, are among some of the actions the provincial DI team continues to focus efforts on to alleviate increasing imaging pressures. The actions undertaken are outlined in the three fundamental components of the CT and MR Implementation Plan and include; managing costs, managing wait times and managing demand.

The Diagnostic Imaging Provincial Executive Team (DIPET) directs the strategic development and oversight of DI services and therefore has accountability for this Implementation Plan. DIPET also oversees the operational coordination and integration of services while ensuring consistency of practice, problem resolution and plan deliverables. The success of managing the costs, wait time and demand is dependent on shared accountability with the DI provincial program, AHS medical leaders and collaboration with our referring physicians.

Managing Costs

Implementation of Actions within DI Action Plan: Focusing on CT and MRI within Projects 1, 2 and 3:

> *Action 1: Ensure Radiologists fees are in line with Canadian peers*
> *Action 2: Expand utilization modelling to determine the need for DI*
> > **Part of Project 3 & 4*
> *Action 3: Reinvest Savings to support sustainability*

Focused efforts on:

- Secure sustained funding that supports growth in demand
- Lowering cost per exam to internally fund the initiative
- Staffing and equipment capacity utilization
- Expand capacity models to increase exams with existing resources
- Increase efficiency using operational best practice concepts

Project 1: Radiologist Contract Negotiations

Action Plan Alignment;
> *Action 1: Ensure Radiologists fees are in line with Canadian Peers*

Action 1: Ensure Radiologists fees are in line with Canadian Peers
<u>*Radiologist Contract Negotiations*</u>

The direct operating cost related to CT and MR scanning is a combination of staff salaries, radiologist professional fees and supply expenses. The radiologist component of operating expenses is identified in the "AHS Review Initiatives" as PO6 - Radiologist Contracts. The intention of the initiative is to alter the current level of compensation for professional services related to primary interpretation of diagnostic imaging examinations by radiologists to align with comparator provinces. The initiative is currently underway and has a completion target of September 2021.

In 2019 new fee for service rates were established in Calgary and Edmonton with three of the largest service provides in Alberta. This resulted in approximately $12M in fee for service reduction. These adjusted rates may have an effect on the initial national benchmarking and is the reason for task 1.4 noted below. The savings potential from P06 Radiologist Contracts is currently identified for reinvestment into the CT and MR Action Plan.

To address initiative P06 – Radiologist Contract Negotiations: AHS is working with the quidance from Healthcare Contract Secretariat established by Alberta Health to negotiate an agreement with Radiologist Service Providers. Specific details such as; shape of the scope of service, compensation model options and national benchmarking will be part of negotiations. .

Assumptions:

- The contract negotiations process will result in savings that will contribute to the overall CT and MR Action Plan and will harmonize the interpretation rates provincially.

- Reduced rates results in lower cost per exam for future investment in CT and MR activity.

Dependencies/Risk:

- Negotiations may not align with timelines.

Tasks/Timeline:

Task 1.1 Medical leadership engagement	Date: June – July 2020
Task 1.2 Scope of Service definition	Date: June – July 2020

Task 1.3 National Benchmarking Re-evaluation in conjunction with Alberta Health	Date: September 2020 – October 2020
Task 1.4 Compensation Model Analysis	Date: September 2020 – October 2020
Task 1.5 RFP authorship / release	Removed
Task 1.6 RFP response assessment and award	Removed
Task 1.7 Contract Negotiations with Service Providers	September 2020-January 2021
Task 1.8 Implementation of new contract with Service Providers	September 2021

Progress Measurement:

- Match radiologist service levels to clinical needs.

- Monitoring contract established performance measures (Report turnaround time, peer review compliance, Annual report of quality activities, etc.).

- Establishment of proper Radiologist contract governance model.

- Post award engagement of Zone Leadership ensuring radiologist service levels are maintained or enhanced.

- Established reimbursement is in line with national benchmark.

Accountability:

- AHS Executive Leadership Team
- Senior Operating Officer, AHS Provincial DI
- Senior Medical Director, AHS Provincial DI
- Diagnostic Imaging Provincial Executive Team (DIPET), AHS

Project 2: Staff and Scanner Optimization
Action Plan Alignment;
   Action 2: Expand utilization modelling to determine the need for DI

Action 2: Expand utilization modelling to determine the need for DI
2a. Managing staffing costs and equipment optimization

There are two objectives identified in this category:

1. Optimize existing staffing using Operational Best Practice (OBP)

DI, CT and MRI Implementation Plan   5

OBP is a measure of paid staff time relative to effort and is a staffing optimization activity. This is expressed in workload unit minutes / paid hour. OBP productivity targets based on comparison of like imaging sites will be used to guide staffing level decisions with the objective of functioning to median target initially and then best quartile relative to internal peers. This initiative is part of current practice and has resulted in a more efficient workforce and significant savings to date. Work to expanding the project beyond the 16 acute care sites and re-evaluate targets is ongoing. Through Activity Based Budgeting (ABB) funding will be based on median OBP targets of peer sites.

2. Use CT and MR scanner assets efficiently

Maximizing equipment efficiency will reduce the cost per exam, ultimately reducing the required funding of this three year initiative. Scanning stretch targets of 4 exams per hour for CT scanner, and 2 exams per hour MR scanner will be used as benchmarks to drive the equipment efficiency.

It is important to note that certain CT and MR scanners that have a high number of lengthy exams scheduled, such as cardiac MR and interventional CT and will likely not meet exam per hour targets; or the catchment area for the scanner does not have the local population to support operating at that advanced capacity; However, OBP targets do apply for staffing levels.

Imaging techniques and duration of imaging exams is a factor of managing cost and contributes to cost per exam. Standardized efficient imaging protocols at a provincial level, can reduce variation and cost per exam and may aid in managing cost. Standard protocols should be established as part of the Connect Care initiative.

Assumptions:

- Collective bargaining with technical and nursing professionals is outside the scope of the action items but Alberta salaries and collective agreement terms do influence cost per exam.

Dependencies/Risks:

- Enhancement to existing data dashboards to support the reporting.

- Enhanced Infection Prevention & Control requirements, will have an impact on efficiency.

Tasks/Timeline:

Task 2a.1 – Operation Best Practice, Maximize efficiency by matching workload with appropriate staffing levels, ensuring sites work towards median and best quartile targets	Date: March 31 2021 Operate to Median target for 16 acute care facilities
	Date: March 31 2021 Establish target for non-acute care scanning facilities
	Date: March 31 2022 Operate to best quartile for 16 acute care facilities
	Date: March 31 2022 Operate to median for non-acute care scanning facilities.
	Date: March 31 2023 Operate to best quartile for non-acute care scanning facilities.

Task 2a.2 OBP targets used in staffing vacancy management decision process	**Complete**
Task 2a.3 Equipment scanning targets – create equipment scanning target monitoring tool	Date: July – August 2020
Task 2a.4 Exam Allocation to optimize Equipment – Local planning to optimize scanners to targets of 4 exams per hour in CT and 2 exams per hour in MR where appropriate	Date: July – August 2020
Task 2a.5 Establish reporting dashboard including variance analysis by DI Managers	Date: September 2020- March 2021
Task 2a.6 Standardized provincial protocols for CT and MR balancing quality with efficiency	Date: August 2020 – fall 2022 (end of Connect Care implementation)

Progress Measurement:

- Using a similar method to AHS financial reporting, DI leadership will monitor progress to OBP and equipment efficiency targets including explanation for variance and action plan for corrective intervention.

Accountability:

- DI Senior Operating Officer

- Zone DI Executive Directors/Director

- Director DI Decision Support

- Manager DI Business Advisory Services.

Project 3: Reinvestment of Savings
Action Plan Alignment;
        Action 3: Reinvest savings in DI to support sustainability

Action 3: Reinvest savings in DI to support sustainability
Reinvest Savings to support Action Plan

Demand for CT and MRI scans is increasing year over year. Savings generated by cost containment, appropriateness activities, and efficiency initiatives must be re-invested within DI rather than be re-allocated elsewhere within AHS. The initial focus of this re-investment should be placed on increasing system capacity.

The Minister of Health has directed AHS to implement an Action Plan that will bring CT and MRI wait times back to acceptable benchmarks (D2-2020). All actions required in the Directive are to be funded from AHS' fixed global budget. The reduction in wait times to be achieved by March 31, 2023.

Upon approval of the CT and MR Implementation Plan, a request will be submitted to the AHS Executive Leadership Team requesting re-investment of funding.

The Reinvestment strategy will leverage potential savings from three DI related topics referenced in the "AHS Review Initiatives"

- • PO6 – Radiologist Contracts (Project 1)

- • CSS2 – Improve DI Utilization (Project 3)

- • CSS1 – Clinical Appropriateness (with several DI sub-initiatives) (Project 7)

Assumptions:

- AHS Executive Leadership will endorse reinvestment of identified items in the access plan.

- Radiologist Contract Negotiations is successful in achieving further savings.

Dependencies/Risk:

Success of the DI CT and MR Action Plan are dependent on reinvestment of savings from the AHS Review DI topics.

Tasks/Timeline:

Task 1 - P06 Radiologist Contracts Project 1	Refer to Action item #1 : "Ensure radiologist's fees are in line with Canadian peers (radiologist Contract Negotiations)"
Task 2 – DI Utilization Project 3	Refer to Action # 2b: "Managing Staffing Cost"
Task 3 – Clinical Appropriateness Project 6	Refer to Action # 8: "Develop and administer an ongoing referral quality improvement process"

Progress Measurement:

- Upon approval of the CT and MR Implementation Plan the appropriate activity budget will be loaded to the CT and MR scanning operational functional centres.

- Standard AHS variance reporting will monitor exam activity, operating expense and cost per exam. Operating spending is rolled up to the program level and monitored by DI Provincial Executive team.

- Three measures monitor CT and MR expense;
    - o Actual exam activity should not exceed budget exam activity.
    - o Actual expense should not exceed budget dollars.
    - o Cost per exam should be within 5% of peer facilities within Alberta as defined during OBP target setting.

Accountability:

- AHS Executive Leadership Team

- Senior Operating Officer, AHS Provincial DI

- Senior Medical Director, AHS Provincial DI

- DIPET

Managing Wait Times

Implementation of Actions within DI Action Plan: Focusing on CT and MR within Projects 4, 5 and 6:

> *Action 2: Expand Utilization Modelling to determine the need for DI*
>
> *Action 4: Spread the use of analytics to more accurately allocate capacity in each zone*
>
> *Action 5: Cross-zone booking will be implemented to manage surges in DI demand*
>
> *Action 6: Further standardize triage processes to minimize cross-zonal variation*
>
> *Action 7: Reallocate AHS budget to Increase capacity for high-priority DI scans*
>
> *Action 12: Perform quality improvement initiatives on the triage protocols to improve value over time*

Focused efforts on:

- Defining Key Performance indicators (KPI).
- Assign allocation of provincial activity/budget.
- Assign local geographical area allocation with respective zones based on age adjusted per capita assessment.
- Next available patient centric scheduling that considers patients desire to travel and specialized exam availability within the zone or across zones.
- Actively allocate access to high priority imaging by monitoring anticipated wait times.
- Audit and standardize intake triage assessment of referral prioritization.
- Sustained Investment to match demand growth would allow DI to meet clinical demand and provincial wait time targets for our patients.

Project 4: Capacity Allocation and Utilization Modelling
Action Plan Alignment;
> *Action 2: Expand utilization modelling to determine, in a community, the need for DI*
> > **Part of Project 3 & 4*
> *Action 4: Spread the use of analytics to more accurately allocate capacity in each zone*

Action 2: Expand utilization modelling to determine, in a community, the need for DI
<u>2b. per Capita imaging assessment and allocation model</u>

To determine the appropriate distribution of budgeted activity within the 3 year plan and to adjust towards equitable access for Albertans, DIPET is using a standardized age adjusted per capita imaging

rate model. The model uses a utilization per capita target and recommends allocation to each zone as an alteration to existing exam budget activity. The allocation will bring each zone closer to the provincial utilization rate. The provincial per capita target is calculated using the projected increase in DI activity accounting for the 5% and 3% growth in CT and MR combined with the additional exams necessary to reduce the wait times within targets.

The model was created with assistance from the AHS Data and Analytics program and was reviewed and endorsed by Zone Medical Directors and the DI Provincial Executive. The per capita imaging rates are adjusted for referral patterns and consider standard indirect age correction by modality applied at the zone and local area level. The model aligns with other models for resource allocation in AHS.

Model Principles:
- Calculate the volume of exams necessary to serve the patients within the clinical target wait times accounting for annual growth of 3% and 5%.
- Use the volume and population data to match CT and MR access to clinical demand. The goal is to achieve a consistent per capita imaging rate for Alberta.
- Use "age and referral adjusted" scan rates per capita data for the activity allocation with a goal of equitable service.
- Scan Rates for individual zones will not be reduced below current values.
- Align activity with Service Plans including DI, Zone and Program
- Future model will consider Indigenous and Socioeconomic status (proposed for year 2, 2021/22).

The total allocation of exams used to create the provincial per capita imaging target for CT and MR is influenced by imaging demand growth and patients currently waiting outside the clinical target wait time. In a recent analysis, AHS reviewed demand growth and measured patients waiting outside the established clinical targets. A correction to activity was estimated over a three year time frame using 5 years of historical growth that included the necessary additional exams to keep pace with both annual demand growth and catch up on the existing waitlist. The expected per capita imaging rates for year one of this initiative are 106.9 CT's and 50.93 MRI's per 1000 resident.

The 2017-18 fiscal year was used as the activity baseline. The growth rate over the last five years annually for CT is 5% and for MRI is 3.5%.; this is applied to the budget for the implementation year of 2020-21. Year one of the initiative, 2020/21, will compensate for the prior three of growth and will add an additional 65,000 CT exams and 18,000 MR Exams. Year 2 and 3 of the plan, 2021/22 and 2022/23 respectively, will increase CT imaging by 5% and MR imaging by 3.5% annually. The zone and local geographical area allocations will be calculated annually using the most current utilization data with the goal of adjusting to ensure equitable access.

The analysis included patients waiting in category urgent (P1), semi urgent (P2) and elective (P3) and concluded that 27,363 of 32,579 (83.9%) patients waiting were outside the clinical targets for CT examination, and 37,408 of 48,871 (76.5%) were outside the clinical target for MRI. These outliers became part of the three year correction.

Assumptions:

- Imaging referral patterns will return to pre COVID-19 Pandemic levels.

- Age of the population is a reasonable proxy measure for CT and MR utilization rates when populations differ from one zone to another.

- Growth rate of demand will remain at or below present rates.

Dependencies/Risks:

- Activity funding approval by AHS Senior Leadership.

- Adequate human resources availability.

- Referral patterns are altered by COVID-19 Pandemic potentially complicating annual scan rates per capita measures.

- Reduced wait times and increased access could increase demand growth.

Tasks/Timeline:

Task 2b.1 - Create model framework and seek endorsement from medical leadership and DIPET	Date: May 2020 **Status - complete**
Task 2b.2 - Calculate the necessary correction to exam budget volume using historic growth pattern and assessing patient wait times	Date: May 2020 **Status - complete**
Task 2b.3 - Calculate zone level allocation of exam budget	Date: June 2020 **Status - complete**
Task 2b.4 – Facility Allocation Planning, Distribute budgeted exams within the zones to local areas using the same allocation technique.	Date: July- October 2020
Task 2b.5 - Year two allocation DI will evolve the per capita model to consider population correction for indigenous and socioeconomic status influence.	Date: January – March 2021

Progress Measurement:

- The Action Plan aims to achieve equitable access to CT and MR scanning for all Albertans regardless of location. The measure of access is the scan rate per one thousand residents (per 1000).

- In year one the age adjusted scan rate per one thousand residents will vary by less than 5% for the five AHS zones and will be within 5% of 106.9 CT's and 50.93 MRI's per 1000 resident targets.

- The measure will be available quarterly and will be compared to the current 2019-20 rates of 94.26 for CT's and 43.79 MRI's per 1000.

- Patient wait time aligns with clinical targets

- Reduced variation in wait time between zone

- Expected utilization rates:

Fiscal Year	CT Scan Rate per 1000 Residents	MR Scan Rate per 1000 Residents
Benchmark 2019 -20	94.26	43.79
Year One 20-21	106.9	50.93
Year Two 21-22 *	114.48	55.24
Year Three 22-23 *	122.34	59.60

Population growth will influence the year two and three target scan rates per capita. The projections are based on population in 2019-20.

Accountability:

- DI Senior Operating Officer

- Provincial DI Senior Medical Director

- Zone Leadership DYADs

- DI Operations Managers

Action 4: Spread the use of analytics to more accurately allocate capacity in each zone
<u>Local allocation of capacity</u>

Constant monitoring of inbound referral trends, the number of patients waiting for service and the associated wait time is necessary to ensure the appropriate allocation of appointments. Local zone DI leadership will monitor and adjust the availability of urgent, semi-urgent and routine/elective appointments to match the trends. The priority is providing acceptable wait times for the most urgent and semi-urgent exams. Access to information allows local teams to adjust access prior to escalation of patients waiting outside the clinical target guidelines.

The implementation of Connect Care will standardize the data collection and enable analytics to support this initiative consistently across all sites. In the interim, local analytics will be enhanced to support zone DI leadership. Zone DI leadership will document a local plan and implement a local strategy based on the Calgary methodology.

Assumptions:

- Connect Care Epic scheduling model implementation complete

Dependencies/Risks:

- Dependency with Connect Care timeline including successful expanded access and use of patient portal.

Tasks/Timeline:

Task 4.1 Connect Care Priority Allocation Model. Take learning from the Calgary process and apply to connect care implementation.	Date: Fall 2022 – End of wave 7 Connect Care
Task 4.2 interim action - Develop Analytic Suite of Tools to monitor key performance indicators for consumption and action by local DI leadership teams	Date: September 2020 – March 2021
Task 4.3 Local DI leadership teams document process for monitoring trends and taking allocation action.	Date March 2021 – May 2021

Progress Measurement:

- Key Performance Indicators include:
- Actual 90th percentile wait times (retrospective look at performance)
- Anticipated 90th percentile wait times (prospective look at what is on the horizon)
- Number of patients waiting
- Actual percentage of patients served within clinical targets
- Anticipated percentage of patients waiting beyond the clinical targets
- Referral intake volume trend

Accountability:

- DI Senior Operating Officer
- Provincial DI Senior Medical Director
- Zone Leadership DYADs
- Director, AHS DI, Decision Support

Project 5: Connect Care Initiatives (assisting with wait times)

Action Plan Alignment;

   Action 5: Cross-zone booking will be implemented to manage surges in DI demand
   Action 6: Further standardize triage processes to minimize cross-zonal variation
   Action 12: Perform quality improvement initiatives on the triage protocols to improve value over
      time
         *Part of Project 5 & 8

Action 5: Cross-zone booking will be implemented to manage surges in DI demand
Patient centric scheduling

The Calgary and Edmonton zones currently have centralized scheduling processes that enable patient centric scheduling of imaging exams and level out wait times across the zones. The Connect Care initiative will enable expansion of both process and technology to offer patients a next available appointment matching the appropriate clinical category within a zone or across zones. The technology and workflow will include the ability to accommodate patient's requests for specific locations if willing to travel for service where appropriate. This includes access to specialized exams that are only available in certain sites.

Assumptions:

- Connect Care Epic scheduling model implementation complete

Dependencies/Risks:

- Dependency with Connect Care timeline including successful expanded access and use of patient portal.

- Radiologist sub specialty may be required for cross jurisdictional appointment interpretation.

- Sites are able to perform referred exams. Some specialized exams may only be completed at limited sites.

Tasks/Timeline:

Task 5.1 Continue DI Scheduling design within connect care including "next available" appointment functionality across facilities.	Date: Started November 2019 till fall 2022 completion of the 7th wave
Task 5.2 Interim Task – Adjust Policy DIAO4.6 "Request for Diagnostic Imaging Services" collect patient willingness to travel for appointments when appropriate.	Date April 2021
Task 5.3 Adjust intake request forms to capture willingness to travel for appointment	Date April 2021

Task 5.4 Patient Experience Survey pre and post connect care implementation	Staged with Connect Care waves

Progress Measurement:

- Successful policy change.

- Connect Care implementation Complete.

- Increased patient experience results post connect care implementation (scheduling centric survey pre and post implementation).

Accountability:

- Senior Operating Officer, AHS DI

- Senior Medical Director, AHS Provincial DI

- Director, AHS DI Quality, Safety & Education

Action 6: Further Standardize triage processes to minimize cross-zonal variation
<u>*Consistent Prioritization*</u>

The Connect Care initiative will enable electronic review of inbound referrals. The radiologist will select imaging protocols and prioritize urgency based on predefined provincial content. The application of information in this systematic way will enable the analytics for evaluating assignment of clinical priorities by zone, facility and individual, and enable monitoring of referral rejection rates with the intention of decreasing variability. The program will create individualized radiologist scorecard identifying practice relative to peers making possible audit and feedback process amongst peer radiologists. The learning may contribute to enhancing the Provincial Prioritization & Indications Guidelines including; CT Prioritization Guidelines, MRI Prioritization Guidelines, and PET/CT Prioritization Guidelines.

Assumptions:

- Connect Care Epic product has the ability to capture the data necessary to support the initiative.

- Consistent application of prioritization guidelines are dependent on wait times being within target.

Dependencies/Risks:

- Successful implementation of Connect Care.

- Successful Contract Negotiations (including quality based initiatives).

- Adequate clinical information provided by referring provider.

Tasks/Timeline:

Task 6.1 Develop analytic tool to support prioritization and rejection rate evaluation	Date July 2020 - End of Wave 2 connect care
Task 6.2 Establish audit and feedback process using radiologist scorecards	Date: End of wave 7 when all DI sites are using Epic to triage imaging requests
Task 6.3 Establish a formal wait time target for emergency and inpatient CT and MR imaging	Date: July 2020 – March 2021
Task 6.4 Review and Enhance Provincial Guidelines	Date: Year three April 2022 March 2023

Progress Measurement:

- Measure variability in priority assignment and reject rates.
- Escalation of outlier activity to Zone Medical Director.

Accountability:

- Director, Decision Support, AHS DI
- Senior Medical Director, AHS, Provincial DI

Action 12: Perform quality improvement initiatives on the triage protocols to improve value over time
Active integration of Clinical Decision Support (CDS)

This Action is closely related to *Action # 8: Request referral analytics and action*. The Connect Care platform will enable active integration between Epic order entry, (including Epic Care Link users), and the CDS software, CareSelect. At the time of patient referral for CT and MR, the software's artificial intelligence module guides the order entry user to clinical indications for exams base on several variables ultimately providing the clinician with a real time scoring of the exam order entry including an opportunity to alter the order based on recommendations compared to standards.

Assumptions:

- Orders placed for CT and MR by primary care physicians and clinicians will occur within connect care via Epic Care Link.

Dependencies/Risks:

- AHS CDS Committee endorses use of active integration at the point of care for Epic Care Link users.
- Physicians external to AHS participate in Epic Care Link order entry.

Tasks/Timeline:

Task 3 identified in action # 8 above is applicable to action # 12. Enable active real time clinical decision support integration between CareSelect and Epic to coincide with orders from primary care via "Epic Care Link" thus enabling real time feedback to primary care clinicians	Date: TBD Should coincide with the implementation of Epic Care Link order entry for clinicians working outside of AHS facilities.

Progress Measurement:

- Upon successful implementation there will be an increased appropriateness of DI referrals. This can be measured with analytics generated from the decision support software.

Accountability:

- Senior Operating Officer, AHS Provincial DI

- Senior Medical Director, AHS Provincial DI

- Director, Decision Support, AHS Provincial DI

Project 6: Sustainable Funding

Action Plan Alignment;
Action 7: Reallocate AHS budget to increase capacity for high-priority DI scans

Action 7: Reallocate AHS budget to increase capacity for high-priority DI scans
Collaborative activity budgeting

The long term management of CT and MR wait times must evolve beyond decreasing the cost per exam and reducing the occurrence of low value imaging. Savings from these items have limitations and may not keep pace with the annual demand growth. Factors like population growth, advancing technology, new indications for imaging and patient expectations complicate long term success. It will be necessary for AHS to consider impact to DI as a supporting service when program expansion occurs. Program initiatives like cancer care access, surgical volume increase and facility expansion will be part of the ongoing sustainability of funding. Executive Leadership should consider DI demand as part of an overall AHS Access Plan.

DIPET must create a long term sustainability plan that includes constant evaluation of cost per exam with the intention of maximizing efficiency, continued reduction in low value imaging and inter-program consideration as non DI programs expand.

Assumptions:

- Year 1-3 of the initiative is approved and DI transitions to sustainability

Dependencies/Risks:

- No increase to DI funding as other programs expand

Tasks/Timeline:

Task 7.1 DIPET to evaluate present growth projections and create a long term growth strategy	Date: Year 3 April 1 2022 -September 2022

Progress Measurement:

- Increased percentage of appropriate referrals.

- Sustained wait times that meet clinical targets.

- Sustained percentage of patients served within wait time targets.

Accountability:

- ELT, Provincial AHS

- Senior Operating Officer, AHS Provincial DI

- Senior Medical Director, AHS Provincial DI

Managing Demand

Implementation of Actions within DI Action Plan: Focusing on CT and MR within Projects 7, 8 and 9:
  Action 8: Develop and administer an ongoing referral quality improvement process
      *Part of Project 7 & 8
  Action 9: Support primary care and AHS clinician education
      * Part of Project 7 & 8
  Action 10: Use Connect Care CDS to improve appropriateness of AHS DI ordering
  Action 11: Work with Strategic Clinical Networks to implement quality improvement initiatives
  Action 12: Perform quality improvement initiatives on the triage protocols to improve value over time
      *Part of Project 5 & 8

Focused efforts on:

- Physician engagement and education
- Manage patient expectations
- Continue clinical appropriateness work as identified in the AHS Review Implementation Office (ARIO) consolidated appropriateness initiative
- Participate in AHS Atlas of Variation activities identifying best practice where variation is identified
- Move forward with Electronic Clinical Decision Support including an audit and feedback component for referring physicians
- Manage growth trends collaboratively with clinician stakeholders
- Empower AHS Departments to manage physicians who are consistently outliers when it comes to imaging utilization

Project 7: CDS within Connect Care

Action Plan Alignment;

> *Action 8: Develop and administer an ongoing referral quality improvement process*
> **Part of Project 7 & 8*
> *Action 9: Support primary care and AHS clinician education*
> **Part of Project 7 & 8*
> *Action 10: Use Connect Care CDS to improve appropriateness of AHS DI ordering*

Action 8: Develop and administer an ongoing referral quality improvement process
<u>*Request referral analytics and action*</u>

Lack of uniform orders based software has been a barrier to consistently achieving comprehensive review of request intake and therefor has limited constructive feedback to referring physicians. Within the connect care initiative DI aims to standardize the intake process and capture several key information elements for each imaging referral creating the foundation for a comprehensive program including education or real time order entry advice for referring clinicians.

The Key data elements include;

- Consistent Physician identification including practice specialty will enable comparison of individuals to peers (**Who** is placing the orders?)

- Specific orders for exams will come from a single examination catalog. (**What** order is requested?)

- The patient and facility location (**Where** the patient resides and **where** the exam is performed)

- Dates and times of referrals and subsequent actions will be captured enabling frequency analysis. (**When** events occur)

- Imaging appropriateness scores for advanced imaging CT and MR requests will be captured based on scoring criteria endorsed by the American College of Radiologists, The Society for Pediatric Radiologists, American College of Cardiology, Society of Nuclear Medicine and Molecular Imaging and the National Comprehensive Cancer Network. (When the CareSelect software is applied in Canada the licensee is given authority to adjust the scoring criteria based on local variation to the established criteria ultimately enabling an Alberta customization. (**Why** the exam is being requested)

- Rates of referral rejection or alteration to a more appropriate testing will be captured

The consistent data capture of Who, What, Where, When and Why a referral is sent for CT and MR imaging including an appropriateness score and rejection rate will enable individualized or program based detailed reporting and inform the creation of educational material.

Assumptions:

- Orders placed for CT and MR by primary care physicians will occur via Connect Care through Epic Care Link.

Dependencies/Risks:

- AHS Clinical Decision Support Committee endorsement of "Active Integration".

- Adoption of Epic Care Link as mandatory tool for External DI Order Entry.

- Success is dependent on support from Medical Leaders from other programs.

- AH and AHS agreement on Epic Care link usage in primary care.

Risk Mitigation:

The absence of mandatory electronic order entry with embedded decision support integrated at the point of care could reduce the success of this initiative. The concept of evaluating order entry requests is diminished if physician participation is limited or the feedback does not occur real time. Alternatives to mandatory real time integration via Epic Care Link would reduce effectiveness but include.

1. Voluntary participation which could yield limited success
2. Referrals would be evaluated upon receipt using the CDS software and returned when inappropriate – this is not a point of care solution.
3. Real time pre referral consultation with radiologist could be possible.
4. Program based or individual orders sets within the Epic solution could promote best practice and reduce low value imaging.

Tasks/Timeline:

Task 8.1 - Install the CareSelect software and collect data	Date: November 2019
Task 8.2 - Evaluate the American scoring system relative to Alberta practice and adjust system response as necessary	Date: September 2020 – March 2021
Task 8.3 - Enable active real time clinical decision support integration between CareSelect and Epic to coincide with orders from primary care via "Epic Care Link" thus enabling real time feedback to primary care clinicians	Date: TBD To coincide with the implementation of Epic Care Link order entry for clinicians working outside of AHS facilities.
Task 8.4 – Evaluate uptake of Care Select software by primary care clinicians.	Date: Fall 2022 – Fall 2023
Task 8.5 – Implement contingencies for primary care clinicians who have not utilized Care Select software.	Date: Fall 2023 commencement

Progress Measurement:

- Advanced analytics on the appropriateness scores and reject rate is possible. The analytics can direct attention to areas with low appropriateness scores where education or intervention should occur.

Accountability:

- Senior Operating Officer, AHS Provincial DI

- DI Senior Medical Director, AHS Provincial DI

- Director, Quality, Safety & Education, AHS Provincial DI

- Director, Decision Support, AHS Provincial DI

- Connect Care Executive Committee, AHS

Action 9: Support Primary Care and AHS Clinician Education
<u>*9a. Referring Physician Education*</u>

Feedback to referring clinicians about imaging referrals is a mandatory component to the initiatives mentioned in *Action #8 Request Referral Analytics and Action.* The data from the initiative will identify opportunity and support radiologists and the DI program in the creation of educational material for referring physician.

The Contract Negotiations mentioned in *Action #1 Ensure Radiologists fees are in line with Canadian Peers,* will include acomponent of quality based work identifying the importance of radiologist participation in imaging appropriateness activities.

Action #11 Work with Strategic Clinical Networks (SCNs) to implement quality improvement initiatives, includes radiologist participation. As a project participant the radiologist is directly involved with establishing best practice recommendation including the supporting material to support the initiative. Both patient and referring physician education is a distinctive component of each imaging appropriateness activity.

Participation in medical rounds involves a portion of physician education as the participating radiologist has opportunity to influence imaging referral practice.

Connect Care enables active real time consultation via in application messaging making the radiologist available to assist referring physicians in decision making.

Assumptions:

- Radiologists and referring clinicians will participate in educational opportunities.

Dependencies/Risks:

- Successful Radiologist Contract Negotiations.

- Connect Care timeline.

- Appropriateness initiatives may increase, decrease or have no impact on demand due to Alberta's already low utilization rate per capita.

- Reduction in Radiologist workforce and engagement.

Tasks/Timeline:

Task 9a.1 - Include Quality Component to Radiologist Contract Negotiations	Date: September 2020
Task 9a.2 - Complete Task 3, Action item 8	Alignment with alternate task previously identified
Task 9a.3 - Radiologist participation in medical rounds	Date – ongoing
Task 9a.4 - Investigate and implement full scope capability of connect care physician to physician direct messaging	Date: April 2021 – Fall of 2022 end of Wave 7 connect care implementation.
Task 9a.5 – In collaboration with SCNs, develop/disseminate educational materials for physicians.	Date: March 2021 – Fall 2022

Progress Measurement:

- Successful completion of Radiologist Contract Negotiations

- Creation of Individualized or Program based scorecards

Accountability:

- Senior Operating Officer, AHS Provincial DI

- DI Senior Medical Director, AHS Provincial DI

- Director, Quality, Safety & Education, AHS Provincial DI

- Director, Decision Support, AHS Provincial DI

- Medical Leadership, AHS Executive

Action 9: Support primary care and AHS clinician education
<u>*9b. Referring physician audit and feedback*</u>

The data captured within Connect Care as described in *Action # 8 "Request Referral Analytics and Action",* will enable advanced analytics about referrals. The consistent data capture of Who, What, Where, When and Why a referral is sent for CT and MR imaging, including an appropriateness score and rejection rate, will enable individualized or program based detailed reporting.

Assumptions:

- Effective Medical leadership governance of Audit and feedback program and enforcement of agreed guidelines.

Dependencies/Risks:

- AHS Clinical Decision Support Committee endorsement of "Active Integration".

- Adoption of Epic Care Link with embedded CDS as the mandatory tool for External DI Order Entry.

Tasks/Timeline:

Task 9b.1 – Referring Clinician Feedback (scorecard)	Date: April 2021 – Fall of 2022 end of Wave 7 connect care implementation.

Progress Measurement:

- Reduction in low value imaging ordering practice as a percentage of all advanced imaging orders as measured by the scoring captured with the CareSelect software integration with Epic.

- The system is capable of measuring individual or program compliance with CDS that will be shared with programs external to diagnostic imaging and Senior Medical Leaders.

Accountability:

- Senior Operating Officer, AHS Provincial DI

- DI Senior Medical Director, AHS Provincial DI

- Director, Quality, Safety & Education, AHS Provincial DI

- Director, Decision Support, AHS Provincial DI

Action 9: Support Primary Care and AHS Clinician Education
9C. Measure Patient Outcomes

The implementation of Connect Care provides the foundation for a longitudinal patient record. The benefits of the longitudinal record include the ability to observe long term patient outcomes. Advanced analytics by combining the diagnostic imaging portions of the record with the outcome information should be possible. Once fully realized as a provincial implementation, attention can be focused on the task. In the short term, this concept will be a priority for DI connect care design.

Collaborative appropriateness initiatives as identified in the AHS Review must contain a component of outcome analysis. This analysis may be as basic as physical chart review and as broad as data integration of clinical system.

The use of synoptic reporting of DI results could enable enhanced data analytics. The DI program will consider evaluating the use of synoptic reporting within our program.

Assumptions:

- Diagnostic imaging data within the Epic product (radiant module) can be linked to patient outcome information in other segments of the application.

Dependencies/Risks:

- Successful Connect Care implementation

- Advanced data analyst training

Tasks/Timeline:

Task 9c.1 – Develop analytics linking utilization to patient outcomes	Date: Fall 2022 (end of Connect Care implementation)
Task 9c.2 – Investigate use of synoptic reporting	Date: April 2021 – March 2022
Task 9C.3 – Inclusion of patient outcomes in all clinical appropriateness initiatives identified in *Action #11 Work with Strategic Clinical Networks to implement quality improvement initiatives*	Date: July 2020 - ongoing

Progress Measurement:

- Outcome measures on selected patient groups, i.e.: treatment for stroke patients.

- In collaboration with the SCNs, identify more patient groups to track patient outcomes.

- More comprehensive outcome data after full implementation of Connect Care.

Accountability:

- Senior Operating Officer, AHS Provincial DI

- DI Senior Medical Director, AHS Provincial DI

- Chief Data and Analytics officer, DIMR

Action 10: Use Connect Care CDS to improve appropriateness of AHS DI ordering
CDS to improve appropriateness of exam orders

This item has been considered within an alternate action tasks previously stated. Please refer to *Action #8 Task 8.3 Enable active real time clinical decision support integration between CareSelect and Epic to coincide with orders from primary care via "Epic Care Link" thus enabling real time feedback to primary care clinicians.* Engagement of stakeholders like the CDS Committee, the Connect Care Coordination Committee with the intent to get approval from the CCEC is key.

Assumptions:

- Orders placed for CT and MR exams by physicians will occur via Connect Care through Epic Care Link

Dependencies/Risks:

- Adoption of Epic Care Link with embedded CDS as the mandatory tool for External DI Order Entry

Risk Mitigation:

The absence of mandatory electronic order entry with embedded decision support integrated at the point of care could reduce the success of this initiative. The concept of evaluating order entry requests is diminished if physician participation is limited or the feedback does not occur real time. Alternatives to mandatory real time integration via Epic Care Link would reduce effectiveness but include.

1. Voluntary participation which could yield limited success

2. Referrals would be evaluated upon receipt using the CDS software and returned when inappropriate – this is not a point of care solution.

3. Real time pre referral consultation with radiologist could be possible.

4. Program based or individual orders sets within the Epic solution could promote best practice and reduce low value imaging.

Tasks/Timeline:

- Refer to *Action #8 Task 8.3 Enable active real time clinical decision support integration between CareSelect and Epic to coincide with orders from primary care via "Epic Care Link" thus enabling real time feedback to primary care clinicians.*

Progress Measurement:

- Advanced analytics on the appropriateness scores and reject rate is possible. The analytics can direct attention to areas with low appropriateness scores where education or adjustment can occur.

Accountability:

- Connect Care Executive Committee (CCEC)

Project 8: Right Care Alberta aimed at reducing low-value imaging
Action Plan Alignment;
> *Action 8: Develop and administer an ongoing referral quality improvement process*
> **Part of Project 7 & 8*
> *Action 9: Support primary care and AHS clinician education*
> **Part of Project 7 & 8*
> *Action 11: Work with Strategic Clinical Networks to implement quality improvement Initiatives*
> *Action 12: Perform quality improvement initiatives on the triage protocols to improve value over time*

Action 8: Develop and administer an ongoing referral quality improvement process
Request referral analytics and action
Refer to Project 7, Action 8 for details

Action 9: Support Primary Care and AHS Clinician Education
9a. Referring Physician Education, 9b. Referring physician audit and feedback, 9C. Measure Patient Outcomes
Refer to Project 7, Action 9 for details

Action 11: Work with Strategic Clinical Networks to implement quality improvement initiatives
Diagnostic Imaging appropriateness

Diagnostic Imaging is an active participant in the more broad AHS appropriateness initiative.

AHS Review item CSS1 – "Clinical Appropriateness" contains several DI related topics aimed and reducing low value imaging in CT and MR.

Initiative Number	Project/Initiative Name
DI2	Cancer: Appropriate use of CTs, MRIs, and PET Scans during and after cancer treatment.
DI3	SH: Develop guidelines for the use of CT scans in management of dementia
DI4	BJH: Implement care paths for shoulder, low back/pain and acute knee to reduce ED visits, reduce inappropriate imaging, testing and slow the demand for surgical care.
DI6	Emergency: Development of guidelines on the use of Oral contrast in CT ABD testing
DI8	ED: Choosing Wisely list of tests and interventions for ED in AB
CH6	Appropriate usage of CT Angiography for minor stroke and TIAs

Assumptions:

Dependencies/Risks:

- Dependent on partnerships with SCNs.

- Radiologist and referring clinician engagement.

Tasks/Timeline:

Initiative Number	Project/Initiative Name	Projected Implementation Start Date	Fiscal Year(s) Projected Savings Realized
DI2	Cancer: Appropriate use of CTs, MRIs, and PET Scans during and after cancer treatment.	Year 2	TBD
DI3	SH: Develop guidelines for the use of CT scans in dementia population	Year 2	TBD
DI4	BJH: Implement care paths for shoulder pain, low back/pain and acute knee to reduce ED visits, reduce inappropriate imaging and demand for surgical care.	Fall 2020	Year 1
DI6	Emergency: Development of guidelines on the use of Oral contrast in CT ABD testing	Fall 2020	Year 1

DI8	ED: Choosing Wisely list of tests and interventions for ED in AB	TBD	TBD
CH6	Appropriate usage of CT Angiography for minor stroke and TIAs	Fall 2020	TBD

Progress Measurement:

- Progress oversight by Alberta Health Services Review Implementation Office (ARIO) and Improving Health Outcomes Together (IHOT).

- Reduced referrals relative to each initiative.

Accountability:

- DI Appropriateness leads (IHOT Representative, Director, Decision Support, AHS Provincial DI).

- Senior Program Director, Improving Health Outcomes Together (IHOT)

Action 12: Perform quality improvement initiatives on the triage protocols to improve value over time
Active integration of Clinical Decision Support (CDS)
Refer to Project 5, Action 12 for details

Project 9: Innovation

Action Plan Alignment;

- *Action 13: Accelerate adoption of innovations in radiology to improve patient and system outcomes - AHS and Alberta Health will evaluate, test, and adopt effective emerging technologies, such as Artificial Intelligence and Machine Learning, in radiology to improve patient and system outcomes.*
  Innovation

Diagnostic Imaging is an active participant in the AHS Clinical Health Research, Innovation and Analytic Strategy. The Clinical Health Research, Innovation and Analytics Strategy forms a foundation for AHS as a learning organization—an organization skilled at helping our people to create, acquire and transfer knowledge to raise the standard of health, and care, delivered to all Albertans. The goal is share and use evidence in the delivery of care to improve patient outcomes and support our healthcare professionals and partners in solving healthcare issues of importance to Albertans. The Innovation framework includes the voice of clinicians, educators and industry partners. DI has evaluated technology using this structure successfully and looks forward to future opportunities via the centralized intake and assessment process.

DI will be a contributor to precision health. AHS intends to establish a Bio-Informatics committee to oversee the advanced use of data from multiple sources including genetics, laboratory, diagnostic Imaging, etc., with the intention of leveraging "big data" to advance health outcomes for Albertans.

The enabling foundation to advanced clinical data analyses is an alteration to the existing PACS storage archive. In 2021, AHS IT will initiate a project aimed at replacing the current infrastructure with a "Cloud Based" archive paving the way for future advanced learning and artificial intelligence.

Synoptic reporting of radiology results is an enabler to advanced clinical analytics. This initiative is mentioned in *task 9c.2 – Investigate use of synoptic reporting*.

The action identified are intentionally aimed at providing the foundation to enable this future work.

Assumptions:

- Researchers/innovators with follow the identified intake process

Dependencies/Risks:

- AHS IT planning oversight.

- Participation of other AHS departments providing and archiving "imaging".

Tasks/Timeline:

Task 13.1 – Provincial Imaging Strategy	Date: January 2021
Task 13.2 – PACS infrastructure upgrade (timing scope and cost)	Date: January 2021
Task 13.3 – AHS Bioinformatics Committee	AHS initiative not specific to DI
Task 9c.2 – Investigate use of synoptic reporting	Refer to Project 6

Progress Measurement:

- Completion of provincial imaging strategy document

- Replacement of existing PACS archive

- Functioning Bioinformatics Committee

Accountability:

- Senior Operating Officer, AHS Provincial DI

- DI Senior Medical Director, AHS Provincial DI

- Director, Equipment and Informatics, AHS Provincial DI

- Director, Decision Support, AHS Diagnostic Imaging

Quarterly Reporting

The quarterly report will include measures to identify current status to anticipated project deliverables. The report will enable oversight of progress and prompt provincial or local DI intervention towards meeting targets. It will be share with Alberta Health, Senior AHS Leadership and local zone stakeholders. The information will include provincial and local zone progress.
- Prospective Reporting (anticipated wait time of patients currently waiting)
  - Number of patients awaiting DI CT and MR Scans
  - Anticipated 90th percentile wait times of patients awaiting service
  - Percentage of patients currently waiting outside established clinical target wait times

- Retrospective reporting
    - Actual 90th percentile wait time of patients served within the quarter
    - Percentage of patients served within the clinical target wait time
- Actual activity trends including analysis of variance from budget activity
- Imaging Rates per Capita corrected for age and referral patterns
- Direct Cost per exam calculations provincial and local
- Imaging appropriateness progress of defined initiatives

GLOSSARY

Activity Based Budgeting (ABB):
Combination of approved activity levels with OBP targets to develop budgets for operational areas.

AHS Review Implementation Office (ARIO):
The AHS Exec Leadership Team Sub Committee that reviews and takes accountability for items identified in the AHS Review.

Clinical Appropriateness:
Patients only undergo effective and necessary testing, treatment and clinical procedures and processes, resulting in the highest quality of care.

Computed Tomography (CT):
When images of the internal structures of the body are taken using radiation and computer enhanced imaging. Also known as a CAT scan.

Diagnostic Imaging (DI):
Use of magnetic radiation to produce images of internal structures and organs within the human body to diagnose and treat disease. This involves the use of several technologies such as ultrasound, mammography, x-ray, nuclear medicine imaging, Interventional Radiology, PET/CT, MRI and CT.

DIPET:
Diagnostic Imaging Provincial Executive Team; membership consists of DI Operational Leaders, Program Directors and Clinical DYADS.

DIPOC:
Diagnostic Imaging Provincial Operational Committee; membership consists of DI Operational Leaders and Program Directors.

Epic Care Link:
Epic's web-based application for connecting organizations to their community affiliates. It provides community users secure access to select patient information in our Epic data repository.

Improving Health Outcomes Together (IHOT):
Focused efforts on clinical appropriateness and shared diction making together, known as **Right Care Alberta.** IHOT works with front line leaders, teams and patients to determine the best possible health outcomes while cascading those learnings across the province to ensure the same standard of care.

Magnetic Resonance Imaging (MRI):
A medical imaging technique used to investigate the anatomy and function of the body in health and disease. MRI scanners use magnetic fields and radiowaves to form images of the body to help diagnose disease and identify staging of disease without exposure to ionizing radiation.

90th Percentile:
The value at which 90% of our values fall; wait times and patients waiting.

Operational Best Practice (OBP):
An AHS-wide initiative that benchmarks AHS with comparable counterparts, inside and outside Alberta, to reduce variation in labor and supply expenditures and find efficiencies.

Patient Prioritization:
P1 urgent
P2 semi urgent
P3 elective
P4 scheduled follow-up

Referral Adjusted:
Refers to residents of one jurisdiction may have been scanned in another. The model corrects for these referral patterns. Utilization rates are based on patient postal code not on service location.

Right Care Alberta:
How AHS as an organization is tracking clinical appropriateness and shared decision making to improve health outcomes.