The Evolution of the Medical Trainee Day (MTD) Protocol in Ontario

A review of the history and process to date, and recommendations for future development.

FINAL

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May 20, 2016.

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Respectfully submitted,
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Executive Summary

Medical Education in Ontario is provided by the six Ontario medical schools, and is achieved in the combination of a wide variety of learning experiences: lectures, labs, independent study, simulation, and clinical training in hospitals and other facilities. On-site clinical training and diversity of experience are critically important in preparing learners for eventual practice. The medical schools have a defined curriculum for each program which stipulates the clinical experiences and rotations through hospital/facility services required to prepare trainees appropriately for independent practice, and they are affiliated with many hospitals for these clinical teaching purposes.

The expansion of medical education over the last decade (geographically via satellite campuses, volumetrically in terms of numbers of trainees, and pedagogically in terms of curriculum diversity) has directly impacted the growth and distribution of trainee rotations (and thus, MTDs) in the province. There are additional costs to having learners in hospitals, and a need to account for such costs in order for the MOHLTC to appropriately fund hospitals and medical education; thus the concept of incorporating Medical Trainee Days (MTDs) into the hospital funding formula was introduced in 2000/01.

Initially each individual hospital was responsible for collecting, validating and submitting MTD data to the MOHLTC; however with so many separate institutions involved there were many errors and conflicting records, resulting in huge administrative burden on the hospitals, and many MTD claims rejected. To improve the process, an MTD Implementation Committee was formed, and it set up a pilot whereby the six medical schools took responsibility for collecting the MTD data on behalf of the hospitals in their catchment areas. While this improved the situation, there still remained administrative challenges and many conflicting records. The pilot identified a need to define a single source of truth by designing a system that would enable trainee placements to be audited, and a transparent third-party conflict resolution process that did not directly involve the MOHLTC. In fiscal 2014/15, the Ontario Physician Human Resources Data Centre (OPHRDC) became involved in collecting, validating and submitting the MTD data to the MOHLTC as a single source on behalf of the medical schools and hospitals.

The inclusion of OPHRDC in the MTD process offered several important benefits:
  ➢ OPHRDC has extensive experience in data standardization, cleansing, integration and management, and is widely accepted as providing the "gold standard" of physician and postgraduate medical trainee information for provincial planning purposes.
  ➢ OPHRDC already had a long history and positive working relationships with the Postgraduate Medical Education Offices (PGME) of all Ontario medical schools, and secure, confidential data transfer processes and protocols in place.
  ➢ OPHRDC is a trusted and neutral third party that is recognized by the major stakeholders in the Ontario healthcare system to provide accurate, unbiased information.

In the year leading up to transfer of responsibility for MTD collection to the OPHRDC the Ministry has demonstrated strong commitment to improving communications and receiving input on the process, and has been progressive in implementing enhancements to systems and standards. An effective relationship has developed between the Ministry MTD Team and the OPHRDC, and the Ministry's participatory role has enormously strengthened the process.

Through the collaborative efforts of all stakeholders in this process, great progress has been made in establishing an effective system for MTD data validation, standardization, and conflict resolution which has substantially improved confidence in the data and resulted in markedly fewer rejected claims. However, as the process is still in evolution, a number of remaining Issues and Challenges have been identified through conduct of this review, which include:
- Time and Resource Requirement
- Value of MTD
- Trainee Identification and MINC Number
- Scheduling and Administration
- Data Issues
- Communication
- Issues Management and Appeals

A number of Recommendations are offered for future discussion, which include suggestions for dealing with some of the issues and challenges identified in this Review. The recommendations are divided into two categories: those requiring policy-level discussions, and those of a more procedural or technical nature:

Policy Recommendations:
- Evolve the MTD Implementation Committee to an MTD Steering Committee
- Formalize an Issues Management Process
- Develop an Appeals Process
- Formalize the agreement and operational funding for continued OPHRDC involvement
- Communicate the value of an MTD
- Move toward a common rotation block for all schools

Procedural/Technical Recommendations:
- Maintain and update the Standard Operating Protocol/Procedures
- Establish a Technical Working Group
- Implement a process to require and collect MINC# for all trainees
- Develop and implement a standard mechanism for data collection
- Establish a common dictionary of Program, Service and Facility Site codes
- Develop and implement Communication Initiatives
- Consider implementation of Observed Best Practices where feasible

The successful transition to operational mode represents a milestone achievement for all parties involved in MTD administration. Over time, and with increasing confidence in the MTD Protocol, it may be possible to eventually transition to a more streamlined process in future.

1.0   Background

1.1   Medical Education in Ontario

Medical Education in Ontario is provided by the six Ontario medical schools: McMaster University, the Northern Ontario School of Medicine, the University of Ottawa, Queen's University, the University of Toronto, and the University of Western Ontario. Medical education is achieved in the combination of a wide variety of learning experiences: lectures, labs, independent study, simulation, and clinical training in hospitals and other facilities. From a pedagogical standpoint, on-site clinical training is critically important in preparing learners for eventual practice. Diversity of experience is desirable, and the medical schools have a defined curriculum for each program area which stipulates the clinical experiences and rotations through hospital/facility services required to prepare trainees appropriately for independent practice.

The medical schools are affiliated with many hospitals for clinical teaching purposes. Historically, Academic Health Sciences Centres (AHSCs) have been comprised of a medical school and its affiliated teaching hospitals and academic physicians. In recent years, there has been increased collaboration with community hospitals to accept learners, for a number of reasons. First, although it is desirable to be exposed to rare cases in a tertiary/quaternary centre, tomorrow's physicians also need to be proficient in treating the cases that constitute much of medical practice, and in optimizing the health of people with long-term health issues. Second, community hospitals provide learners with a more "realistic" experience of what their eventual practice environment and caseload will be like, in a Distributed Medical Education (DME) model. Third, it is unlikely the MOHLTC will soon be creating any new academic/teaching hospitals. Therefore to provide diversity in the curriculum and to prepare trainees for actual practice experience, it was deemed valuable to incorporate training in community hospitals and satellite campuses.

There are additional costs to having learners in hospitals: procedures may take longer, additional clinical space and resources are required, and more supplies are needed. There arose a need to account for such costs in order for the MOHLTC to appropriately fund hospitals and medical education, and the concept of incorporating Medical Trainee Days (MTDs) into the hospital funding formula was introduced in 2000/01[1].

1.2   Hospital Funding for Teaching Role in Ontario

Hospitals comprise the largest category of health spending in Canada, accounting for 30% of national health expenditures. In 2014, Ontario spent $20B on hospitals, which represents 40% of the provincial government's spending on health.[2]

Hospital funding in Ontario has for many years been based on "global budgets" whereby hospitals were provided a fixed amount of funding to provide health care services for their

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[1] MOHLTC-OPHRDC Transfer Payment Agreement 2015-02-18, Health Workforce Evidence & Innovation Unit (HWEIU)

[2] Canadian Institute for Health Information, *National Health Expenditure Trends*, 1975 to 2014

populations or "catchment areas" for a given fiscal year. The budgets were largely determined by historical spending and inflation.

Since the early 1990s, the Ontario Ministry of Health and Long-Term Care (MOHLTC) working together with hospitals and other stakeholders in the health care system has attempted to incorporate factors affecting hospital costs into the hospital funding formula. Many factors affect hospital costs, such as patient demographics and volumes, types of services provided, distances from urban centres and clinical teaching. Population growth, demographic shifts, ever-increasing costs of service provision, and ever-tightening of fiscal constraints continue to place extreme pressure on the provincial budget. The current provincial government has stated its intent to balance the budget by 2017/18. As a result, a major area of its focus is health system funding reform.

1.3   Health System Funding Reform

In 2012/13, health care consumed 42 cents of every tax dollar in Ontario and the government projected that without a change, health spending would take up 70% of the provincial budget within 12 years.[3] As this rate of growth is not sustainable, in January 2012 the government initiated changes to funding systems via Health System Funding Reform (HSFR). The plan will move Ontario's health care system away from global funding to a Health Based Allocation Model (HBAM) that attempts to tie funding to expected patient care needs, with a small portion remaining as global funding to cover facility level operating costs. Under the new model, hospitals are compensated based on number of patients, types of services delivered, the evidence-based quality of those services, and the specific needs of the population they serve. HBAM is being phased in over a period of several years that began on April 1, 2012. As of 2015/2016, HSFR will comprise 70%[4] of the funding envelope provided to hospitals with the remaining 30% based on global funding.

MTDs are used within HBAM as an adjustment for each hospital's funding allocation as an indication of "teaching intensity", adjunct to the volume and mix of services provided by the hospital, its size, specialized services (Levels of Care, LOC), and isolation (distance) factors. A Medical Trainee Day is a full day shift/rotation ranging from 7.5 hours to 24 hours that a registered undergraduate or postgraduate medical learner trains/works in a hospital/clinic setting.[5] The "value" of an MTD is not a fixed dollar amount, but rather is based on hospital characteristics, and is variable across hospitals. Further details are provided in Section 4.

The background of MTD capture is complex. Although many quality and process improvements have been made, the MTD methodology is still in evolution. As a result it is timely to review the current status and describe in one document the history and process to date, identifying remaining issues for resolution by the medical schools, hospitals and Ministry, and offering recommendations for future enhancements. Such an analysis is the purpose of this review.

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[3] http://health.gov.on.ca/en/pro/programs/ecfa/funding/hs_funding.aspx
[4] 40% of funding is allocated using HBAM according to hospital and population characteristics and types of services delivered; 30% is allocated to specific Quality-Based Procedures (e.g. cataracts) in a "price x volume" approach
[5] MOHLTC "Medical Trainee Days Submission Standards", Version 2015 10.2 Final, August 11, 2015

2.0   Evolution of the MTD Process in Ontario

Medical education has undergone transformation in recent years. Trainees at both the postgraduate and undergraduate level complete numerous rotations through a variety of hospital departments or "services" throughout the year, and very often undertake rotations at multiple hospitals/facilities to achieve maximum learning opportunities and fulfill curriculum requirements. The expansion of medical education over the last decade (geographically via satellite campuses, volumetrically in terms of numbers of trainees, and pedagogically in terms of curriculum diversity) directly impacted the growth and distribution of trainee rotations (and thus, MTDs) in the province. Learning was extended out into community hospitals at a greatly increased rate, with no set guidelines for hospitals: many hospitals had never taken trainees or collected/submitted MTD data before, and it is acknowledged there was insufficient stakeholder consultation[6].   As a consequence, there were inconsistencies and confusion in MTD reporting and data standards.

The collection of MTD data follows a comprehensive information management strategy consisting of analysis of data quality by validity, reliability and standards. Up to 2012, hospitals were responsible for collecting and validating trainee rotation data, calculating the number of MTDs, and submitting this data to the MOHLTC. Reconciliation of data issues, such as conflicting records and accountability of data was audited by the MOHLTC.[7] Conflicts were flagged by the MOHLTC for resolution by the hospitals in a labour-intensive, time-consuming process that often resulted in many rejected MTD claims, and therefore lost opportunities for funding. The Ministry's Health Data Branch conducted the MTD validation following much the same process from 2000/01 to 2013/14, by which time more than 150 hospitals were submitting MTD data. With so many facilities involved, the potential for conflicting data, errors, oversights and incomplete or missing data, from within one hospital or across many, is obvious.

New standards led to the creation of the MTD Implementation Committee (MTD-IC), a working group tasked with streamlining the submission of MTDs.   In an effort to improve efficiencies, the process was modified in 2013, and the six medical schools began a pilot to manage the MTD data collection and conflict resolution on behalf of the hospitals. It became apparent that this approach was inadequate and administratively onerous, and it was decided to define a single source of truth by designing a system that would enable trainee placements to be audited, and a conflict resolution process that was transparent and did not directly involve the MOHLTC. In fiscal 2014/15, the Ontario Physician Human Resources Data Centre (OPHRDC) became involved in collecting, validating and submitting the MTD data to the MOHLTC as a single source on behalf of the medical schools and hospitals, thus eliminating duplicate claims for the same trainee. The detailed evolution of the MTD process is described below.

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[6] MOHLTC Presentation to MTD Debrief Day, June 11, 2015
[7] COFM:MTD Working Group Presentation "Health Based Allocation Model HBAM and MTD", June13, 2011

2.1   Ministry Refinements

In 2010/11 the Ministry began refining its MTD data collection methods to ensure that MTDs were being reported consistently across the province.[8] Initial investigations revealed significant variation (e.g. MTD reporting for a resident who was on site for 22 days in a given month ranged from 22 MTDs at some hospitals to 31 MTDs at others). To help resolve this issue and ensure fairness across the system, the MOHLTC established two principles:
1. A 275 MTD cap was implemented in 2010, as it is the maximum number of days per year that a resident can work under the Professional Association of Residents of Ontario (PARO) agreement.
2. No more than one MTD may be counted per learner per day, and no institution (or combination of institutions) may report more than 275 MTDs for a single learner in a given year.

2.2   MTD Implementation Committee (MTD-IC)

"*The ways in which residents are placed in hospitals to complete clinical rotations has become more complex. Accounting for their time spent in any given hospital accurately, and avoiding conflicts between hospitals in reporting MTDs has become more challenging. Unresolved conflicts ultimately result in no hospital being credited for the MTD.*"[9]

In support of hospitals and medical schools, in 2012 the Council of Ontario Faculties of Medicine (COFM) in collaboration with the Council of Academic Hospitals of Ontario (CAHO) established an MTD Implementation Committee (MTD-IC) including representatives from the MOHLTC and input from the Ontario Hospital Association (OHA) to develop a consistent approach to the collection and reporting of MTDs. A new methodology was established to improve the validity and reporting of the MTD dataset. It was postulated that given each medical school registers all of its medical learners and defines the curriculum, the medical schools are in a better position at an aggregate level than hospitals to track trainees and their rotations across institutions over the year. COFM proposed that the six medical schools undertake to collect and validate their trainee rotation information with their affiliated hospitals to ensure the MTD data used for hospital funding calculations are accurate, and then submit the MTD data to the MOHLTC for verification and payment to the hospitals according to the following revised process.

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[8] This section taken from Ministry Communication HFO Letter HLTC 2968IT-2012-635, dated Feb 4, 2013, signed by Jeff Goodyear
[9] Memo to Ontario Hospitals Reporting Medical Training Days Oct 9, 2013: Proposal to Collect and Report MTD Data (signed by Dr. Paul Bragg and Dr. Jackie James)

2.3   MTD Collection and Reporting Method (October 2013)[10]

The MTD-IC established the following process for collecting and reporting the MTD data with the intent that it would be a streamlined and beneficial solution for hospitals.

- Each medical school is responsible for creating the MTD report in collaboration with the hospitals located in its region.
- Each medical school will build data validation relationships with each hospital in its region to ensure the accuracy of MTD data. Each hospital will be aligned with one medical school for its data validation needs. The medical school will account for the presence of each medical learner assigned to hospitals within the school's region (regardless of which medical school the learner was from), and communicate that data to each of the hospitals in its region. The hospital will confirm the data are accurate. The medical school will help resolve any conflicts between hospitals in its region.
- Prior to sharing data with hospitals, the medical schools will communicate with each other in situations where a learner is doing a rotation at a hospital in another medical school's region. A hospital with learners from multiple medical schools need only communicate with the medical school it is matched with. That medical school will be responsible for counting the MTDs of all learners at that hospital regardless of which school the learner is from.
- The MTDs will be reported in detail to ensure that hospitals receive the funding that accurately reflects the learner's time at each hospital. MTDs will be reported as days, up to the maximum 275 days cap per learner per year allotted to each hospital, proportional to the time spent at each hospital for each learner, or as a percentage of the total allowable days per reporting period.
- Six reports will be created (one report by each medical school completed in consultation with and to the satisfaction of the hospitals in the school's region) and forwarded to the MOHLTC. This replaces the requirement for each hospital to submit a report independently.
- For hospitals using ROMP to provide MTD data, MTD-IC will work on how the new method of reporting will impact the existing reporting relationships with ROMP (e.g. will ROMP be a "proxy" of the hospital and validate data on behalf of the hospital?)

The MTD-IC anticipated this process would benefit the hospitals as the work of the medical schools in accounting for resident rotation schedules accurately would help alleviate the task of hospitals tracking MTD data independently, and reconciling conflicts with multiple other hospitals. The expectation was that the new process should result in fewer unresolved conflicts and fewer rejected MTDs by the MOHLTC. The MTD-IC implemented a pilot in 2013/14, with a goal to implement the new process for the 2014/15 year.

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[10] This section taken from Memo to Ontario Hospitals Reporting Medical Training Days Oct 9, 2013: Proposal to Collect and Report MTD Data (signed by Dr. Paul Bragg and Dr. Jackie James)

2.4   OPHRDC Involvement

While the changed process of having the medical schools account for trainee rotations would reduce the number of submissions to the Ministry (and also conflicts and rejections), with six separate institutions involved, the pilot identified that there still remained a great deal of conflicting rotation/MTD data, both within and across the medical schools. It was subsequently proposed to involve the OPHRDC as a third party in the MTD data collection, validation, and submission process.

The OPHRDC is a collaborative initiative of the MOHLTC, the College of Physicians and Surgeons of Ontario (CPSO), the Ontario Medical Association (OMA) and COFM. OPHRDC was created in 1992 to serve as a provincial resource of unified, credible and reliable physician and medical trainee information. Since then the OPHRDC has fulfilled this role on behalf of its partners, and has systems and staff focused exclusively on the collection and validation of physician-related data in Ontario.

The inclusion of OPHRDC in the MTD process offered several important benefits:

➢ OPHRDC has extensive experience in data standardization, cleansing, integration and management, and is widely accepted as providing the "gold standard" of physician and postgraduate medical trainee information for provincial planning purposes.
➢ OPHRDC already had a long history and positive working relationships with the Postgraduate Medical Education Offices (PGME) of all Ontario medical schools, and secure, confidential data transfer processes and protocols in place.
➢ OPHRDC is a trusted and neutral third party that is recognized by the major stakeholders in the Ontario healthcare system to provide accurate, unbiased information.

Thus, OPHRDC took over the MTD data review on behalf of the medical schools, and now provides the centralized data cleansing, matching, integration and validation work, identifying discrepancies and errors within each school's submitted data, and across all the schools. Detailed information on the OPHRDC's Data Management Protocol is provided in Section 6 and Appendix E.

3.0 Problems with the Historical Approach and the Need for a Standardized Protocol and Standard Operating Procedures

The hospital costing process, going back to the work of the Joint Policy and Planning Committee (JPPC) in the 1990s, was an attempt to quantify the distribution of funds to hospitals and account for the impact of various factors on costs, for example, medical trainee clinical placements. The MOHLTC and hospitals have a need to document the history of funding decisions and amounts. Given the vast amount of change in the MTD process over a period of several years, there is a great deal of imprecision around what was agreed to, when and how. Communications have been inconsistent across stakeholder groups and the MOHLTC, and there have been mixed messages. The MOHLTC has acknowledged that it has historically not communicated regularly, frequently or effectively with the parties involved in MTD data collection and submission.

With an expansion of medical education and fundamental changes to the hospital funding formula, the previous approach to data collection which involved dozens of separate institutions, many of which had never taken trainees or collected MTD data before, and hundreds of hours of conflict resolution was not effective nor efficient. It is conceivable that 150 hospitals/institutions can have 150 ways of doing things. Similarly, the six medical schools are all using different systems and have different internal processes and rotation schedules. With a lack of guidelines or standards over time, the MOHLTC became concerned the MTD data were not auditable, and identified examples of inconsistent and/or inflated MTD counts. Therefore, there is a need for a standardized protocol and Standard Operating Procedures such that there are clear guidelines described in a living document that can be updated over time.

In the year leading up to transfer of responsibility for MTD collection to the OPHRDC the Ministry has demonstrated strong commitment to improving communications and receiving input on the process, and has been progressive in implementing enhancements to systems and standards. An effective relationship has developed between the Ministry MTD Team and the OPHRDC, and the Ministry's participatory role has enormously strengthened the process.

4.0 Current Approach — MOHLTC Perspective

Information about the MOHLTC's MTD-related processes was obtained from published documentation such as the MTD Submission Standards, and the presentation materials from a multi-stakeholder "MTD First Year Debrief Workshop" held in Toronto on June 11, 2015. Further details are provided in Appendixes F and G.

4.1 MOHLTC Business Rules

The 2015 MOHLTC MTD Submissions Standards document[11] contains the following Business Rules:

1. The same medical learner cannot be working at multiple hospitals at the same time unless it falls within the allocated parameters of a day. The Actual Days reported for a trainee must add up to no more than 1.00 for any single day.
2. Learners must possess either a unique student number[12] (if an undergraduate learner) or a unique CPSO # (if a postgraduate learner).
3. MTD submissions must be done on a quarterly basis via the OPHRDC secure website.
4. The maximum number of capped days a trainee can work within a year is 275[13].
5. Undergraduate students visiting a hospital outside of their university's boundary must provide their student number from the school where they are enrolled for their medical training. A newly created student number from the school that they are visiting is NOT allowed.
6. Postgraduate learners from an out of province or out of country school must have a valid CPSO#.
7. Universities are responsible for keeping the learner's exact records for audit purposes for a minimum of 7 years and may be asked to produce these upon Ministry request.
8. If an undergraduate learner withdraws from one school and goes to another school in the same fiscal year, the learner MUST continue to use the existing student number until the following fiscal year.
9. If a learner's days overlap into the new fiscal year, only days that belong to the [*sic: current*] fiscal year will be reported and counted.
10. If a learner's days overlap into the next quarter, only days that belong to the current quarter will be reported and counted. Days that overlap into the next quarter should be applied to that quarter's reporting data.
11. If a learner changes his/her legal first and/or last name during the fiscal year, universities MUST continue to use/submit the learner's original name for the duration of the current fiscal year and make the necessary changes at the beginning of the new fiscal year.
12. Legal Name is standardized by OPHRDC as the name registered with the CPSO for Postgraduate (PG), Fellow and International Medical Graduate (IMG) trainees, and as the name registered with the School Attended or on the Association of Faculties of

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[11] MOHLTC "Medical Trainee Days Specification", Version 2015 10.2 Final, August 11, 2015

[12] As at June 11, 2015, MOHLTC has agreed to accept student numbers with letters.

[13] As at June 11, 2015, MOHLTC agreed that 276 days will be funded in Leap Years, such as 2016.

Medicine of Canada (AFMC) Student Portal for Undergraduate (UG) trainees. For the 2016-17 MTD year, the legal name will be standardized by OPHRDC as the name registered with MINC for all trainees.

13. If an undergraduate learner changes his/her student category/level of education within one fiscal year reporting period, the submitted records must be incremental and show continuity by fiscal quarter (e.g. U1 in Q1 must be followed in the next reporting period by U2 in Q2, not U1 to U3). [*sic: Postgraduate trainees including Fellows and IMGs may be recorded in more than 2 incremental (such as P2, P3 and P4) or non-sequential (e.g. P2 to P4) categories in the same quarter or year. They also may be claimed with reverse progression (e.g. P3 to P1) when a program change is made.*]

14. MINC[14] must be reported when available for the 2015-16 MTD year. The plan is for it to be mandatory for all records for the 2016-17 year.

The **technical rules** for data submission are described fully in the 2015 MOHLTC MTD Submissions Standards document in Appendix F. In brief:

- Each training record for each hospital must be treated and entered as a separate entry.
- Pro-rations of a trainee across institutions are allowed. Fractional MTDs are allowed[15].
- Record identifiers must have unique values for each record. Identifiers will be generated by OPHRDC for every record that has passed their validation process.
- Updates to, or deletions of, previously accepted records must use the same record ID as previously submitted. The system will verify the record ID and replace the database record with whatever has been resubmitted.
- Order of Data Elements: Record Identifier, Delete, Submission School, School Attended, MINC#, CPSO #, Student #, Program, Last Name, First Name, Training Level, Hospital Service, Period/Quarter, Start Date, End Date, Number of Days, Facility Number, Facility Name, Master (Institution) Number, Change Log (for any changes made to a record on resubmission).

4.2   Ministry Validation Process

The new process with the medical schools' and OPHRDC's participation has greatly reduced the Ministry's front line involvement: it now receives a single file from OPHRDC which has been validated and corrected as needed in three iterations with the medical schools, which coordinate data submission and verification with their affiliated hospitals. This file is validated against the Ministry's business rules and data standards, and an error report is generated for OPHRDC to examine and forward to the schools for resolution (with their hospitals). OPHRDC sends a revised file back to the Ministry, and the most recent results have shown no errors. As the data quality and process are expected to improve over time as all parties become more familiar, it is further expected to see fewer errors, faster processing, and reports in less time.

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[14] MINC# is the Medical Information Number for Canada, a unique, national identification number for every individual entering any aspect of the Canadian medical education or practice system. For more details see Appendix D or http://www.minc-nimc.ca

[15] If a learner works on call or part time, partial days can be reported for the MTD submission. As at June 11, 2015, MOHLTC has agreed to accept 4 decimal places when the cap is applied for the annual submission.

The following flowchart[16] describes the Ministry's Validation Process:
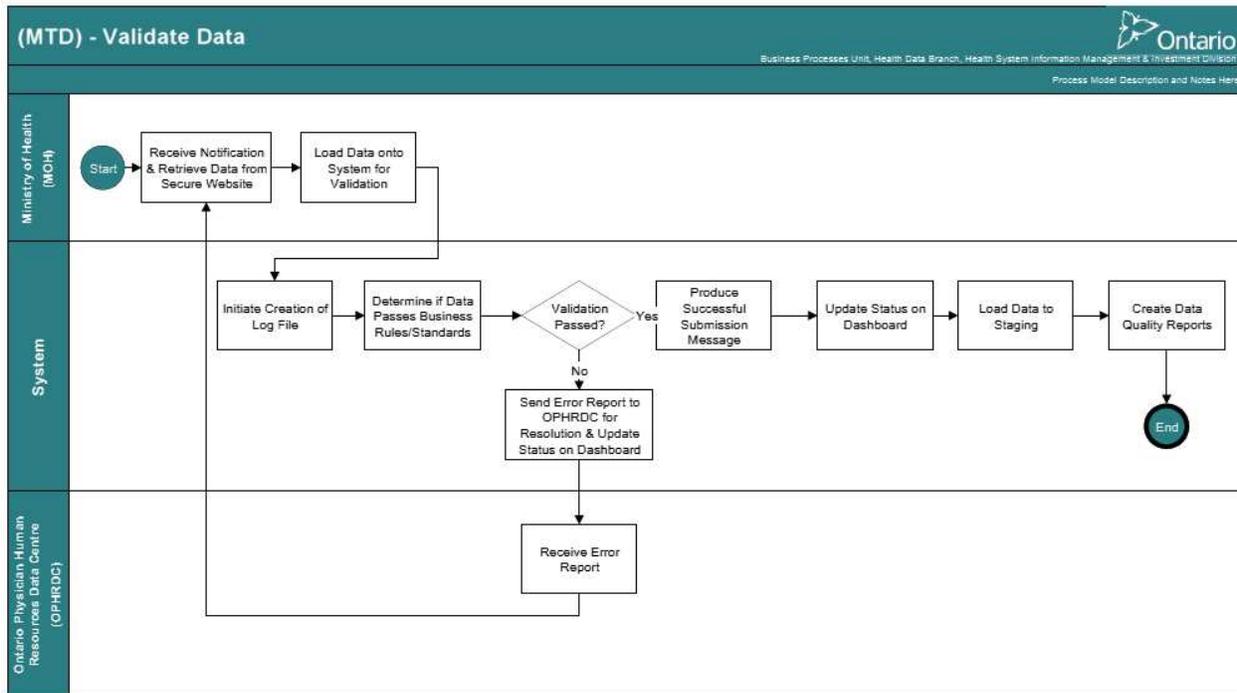
4.3   MTD Submission Timelines

In general, the MTD Submission Timelines are as follows:

Quarter	Submission to OPHRDC	Submission to Ministry	Final Approval of Data
Q1 Data (April 1 to June 30)	3 months after close of Q1	2 months after submission to OPHRDC	1 month after submission to MOHLTC
Q2 (July 1 to September 30)	2 months after close of Q2	2 months after submission to OPHRDC	1 month after submission to MOHLTC
Q3 (October 1 to December 31)	5 weeks after close of Q3	2 months after submission to OPHRDC	1 month after submission to MOHLTC
Q4 (January 1 to March 31)	1 month after close of Q4	1 month after submission to OPHRDC	4 weeks after submission to MOHLTC

Specific dates for the 2015/16 MTD Submissions are included in the table below:

Quarter	Submission to OPHRDC	Submission to Ministry	Ministry Approval of Data
Q1 Data (Apr 1 to June 30)	October 2, 2015	December 4, 2015	January 4, 2016
Q2 (July 1 to Sept 30)	December 4, 2015	February 5, 2016	March 4, 2016
Q3 (Oct 1 to Dec 31)	February 5, 2016	April 4, 2016	May 2, 2016
Q4 (Jan 1 to March 31)	April 29, 2016	June 1, 2016	June 30, 2016

The Ministry Funding Unit requires the MTD data by **June 30** to feed into HBAM to generate funding letters for hospitals. This is a hard-close date defined across the Ministry.

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[16] "Ministry Validation Process" as presented to MTD Debrief Day June 11, 2015, slide 4.

4.4   Quarterly Submission and Opportunities for Review and Adjustment

Year-end for all hospitals is March 31. From 2000/01 to April 2014 the MOHLTC collected and validated the MTD data, at first from transmissions from individual hospitals, then from the six Ontario medical schools on behalf of the hospitals, and currently from OPHRDC. OPHRDC receives a file from each medical school, identifies discrepancies, and informs the schools involved in a conflict over a learner so that the schools can resolve it with their affiliated hospitals and correct the errors. OPHRDC then submits the clean data to MOHLTC quarterly.

There is opportunity for review following each quarter's submission to MOHLTC. Once the Ministry approves each quarter's data, the approved file is forwarded to the schools, which then send each hospital their own file for review. During this review there is opportunity to make changes if errors are found. In order to prevent a last-minute rush of changes as happened in 2014/15, schools (hospitals) will provide their final approval for each quarter within a specified time period (4 weeks for each of Q1 and Q2; 2 weeks for Q3; and 1 week for Q4). Any changes to the Ministry-approved file will be submitted by OPHRDC to the Ministry to be re-approved. After final approval is received from all schools and the Ministry for Q4, the annual cap will be applied by OPHRDC to create the final submission to MOHLTC. Following this final submission, the file is closed and there is no opportunity for corrections except through special appeal (process to be determined).

A "hard close" is required because the Ministry needs the MTD data to be submitted by the end of June in order to feed into other processes, specifically the HBAM funding for hospitals. Hospital funding is dependent in part on incorporation of the MTDs, and as such, they must be submitted, reviewed and accepted in order for funding to flow to hospitals and for the next year's funding letters to be generated. This takes time for Ministry to produce: only 8 staff work on all of HBAM, and they start the upcoming fiscal year's (April 1) funding formula at the beginning of July.

As 2014/15 was a "project year" (i.e. developmental period) some latitude was provided given the extensive amount of review and procedural adjustment required to develop a new operational process and systems. Now that the first full year cycle is complete, it is expected that the mechanisms for conflict resolution now adopted by the schools and OPHRDC will result in smoother processing. Further, the Ministry expects that the schools should be validating on an ongoing basis while the year is still open. As a result, it is expected that the period of review following each quarter will provide adequate time for adjustments to be submitted (for the current and previous quarters), and that adjustments at the end of the year (Q4) should therefore be minimal.

4.5   Ministry Standards Revision Process

Health Data Branch (HDB) has five units (Data Standards Unit, Data Maintenance Unit, Data Development Unit, Data Access and Release Unit, and Information Management Support Centre) and a change management framework in place to address changes and the impacts on

standards, reports, internal systems, software, and how information is collected, recorded and reported. HDB receives and acknowledges requests for changes but does not generally process them to incorporate within the current fiscal year, instead making the changes effective for the next fiscal year. It examines if changes arise internally or externally, if they are changes to the standards themselves or to processes, if they can be implemented in a timely manner, and the effect of changes on stakeholders (e.g. via consultation with MTD-IC). It then determines if the changes are worth adding based on competing priorities, or if the changes are more complex than anticipated, or if testing reveals that implementation will take longer than anticipated. HDB tracks how changes are approved and implemented as depicted in the following flowchart[17]:
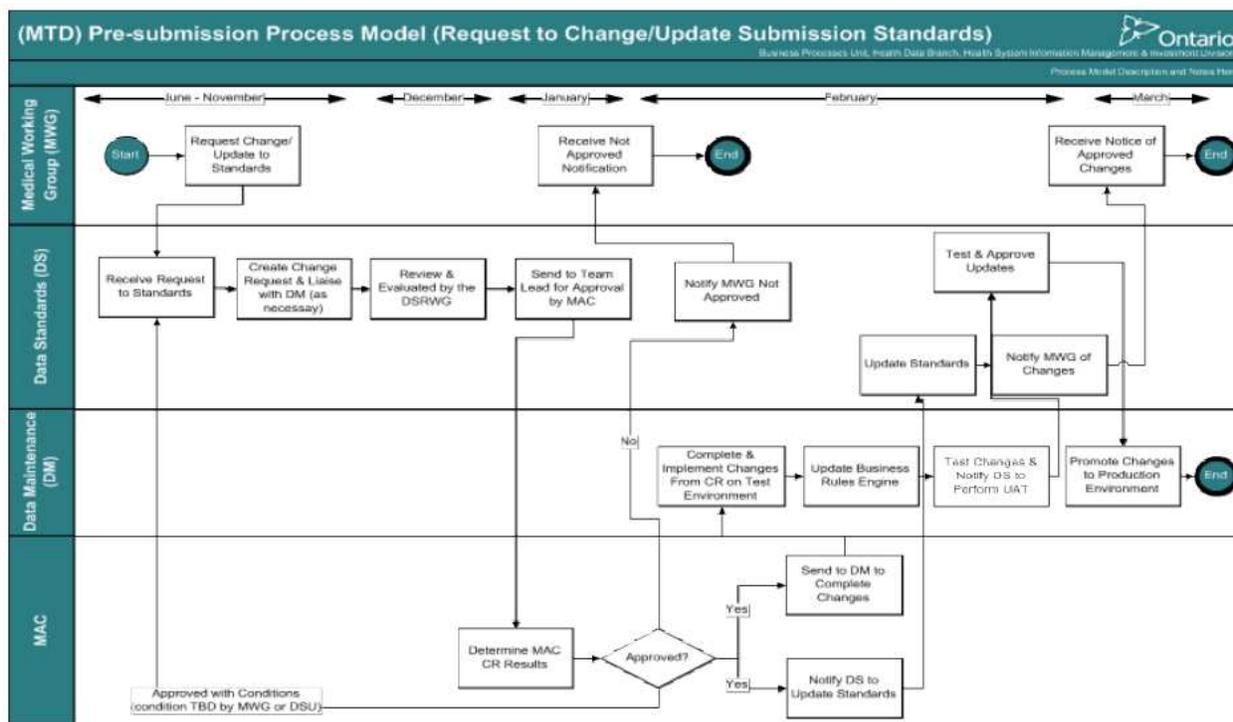
Consider the examples of changes to Student Number format, or a change in number of decimal places submitted (e.g. 0.01 to 0.0001). A proposed change would be reviewed by the Data Standards Review Working Group (internal to Ministry, comprised of various branches including Health System Funding Reform, the five units of HDB, CCIM[18], and IM/IT) and an impact analysis would be conducted by the Data Standards Unit to determine the value-add, time and resources required, and competing priorities. The Management Advisory Committee (MAC) comprised of senior management assesses the feasibility of the change with respect to resources and time, and approves or declines the change. If approved, testing is done in February with a view to implementation in April, and a notification is posted to the

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[17] "MTD Standards Revision Process" as presented to MTD Debrief Day June 11, 2015, slide 7
[18] The vision of Community Care Information Management (CCIM) is to provide seamlessly-integrated, community-based client care where all service providers can securely share and access consistent and accurate information electronically. CCIM consists of two streams and a number of projects to support the Community Care sector.

website that the change will be established in the new fiscal year (April 1). In general, the MOHLTC receives requests for changes to the MTD standards (e.g. field definition enhancements, rounding precision) until the end of June, then examines the feasibility of such changes with a view to publishing the final Standards document for the next fiscal year by the end of July, along with the Submission Timelines.

4.6   Hospital Funding: HBAM and MTDs

As described in Section 1.0, hospital funding represents a significant portion of the provincial health care budget. As approximately 40% of funding is allocated using the HBAM model, this translates to approximately $8B per year. The HBAM model is currently implemented in the hospital sector for five types of care: Acute Inpatient and Day Surgery; Complex Continuing Care; ER; Inpatient Rehabilitation; and Inpatient Mental Health[20]. The funding formula is complex and includes many different factors in a regression analysis. Most hospitals are well versed in the funding formula; however the impact of the value of MTDs on hospital funding is not well understood (i.e. it is not a line item in a hospital's budget).

Hospitals incur additional costs when providing training to medical learners. MTD data are used in HBAM as a teaching adjustment factor when determining hospitals' expected expenses. As such, MTD is an important factor that could affect a hospital's relative performance in the model and therefore its share of funding.

Within HBAM, MTDs have a currency and value in terms of expected hospital operating costs. A 2011 COFM:MTD Working Group report quoted a MOHLTC-provided figure of $61/MTD[21] which was not well communicated, and no update was identified until April 2016, as follows: The extra cost associated with teaching activity is adjusted based on the care type. For the Acute Inpatient and Day Surgery Module, the cost per medical trainee day was calculated using Ontario Case Cost data and reported MTDs for 2004/05. Using simple linear regression of mean weekly cost against mean weekly MTD, the unit cost of a student day was calculated to be approximately $50. This amount was adjusted for inflation to $66 for fiscal 2014/15[22]. For the other care types (ER, Inpatient Rehab, Complex Care and Inpatient Mental Health) no dollar value per MTD has been calculated: the teaching adjustment is incorporated in the expected unit cost calculation by using teaching intensity as a cost variable in the model.

HBAM results are available in February of each year, and the information is posted on www.hsimi.on.ca[23].

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[19] www.hsimi.on.ca is a private website of HDB of MOHLTC, intended to be a means of information and resource delivery to healthcare facilities.

[20] MOHLTC Presentation to MTD Debrief Day, June 11, 2015

[21] COFM:MTD Working Group Report "Recommendations for the Collection and Reporting of MTD Data", November 16, 2011.

[22] HBAM methodology description and update for 2014/15 provided by Louie Luo, MOHLTC, April 29, 2016.

[23] HBAM results are posted under the Health System Funding Reform Index-HBAM-Results-HBAM Results by Care Type-Excel Format-Select Inpatient/DS tab

The integrity and quality of the MTD data is critical to accurate reporting, robust modeling and credibility of the funding allocations which the Local Health Integration Networks (LHINs) provide to Health Service Providers (HSPs). "HBAM uses MTD data reported at the service level, e.g. emergency medicine or psychiatry, and not at the aggregate or facility level and thus effecting [*sic: affecting*] the financial outcomes. Hence accuracy in reporting of MTD at the service level is necessary for high quality MTD input data to be used in HBAM."[24]

The following slide showing an example calculation of hospital costs and incorporating the MTD adjustment was excerpted from a 2011 COFM:MTD Working Group Presentation on HBAM and MTD based on information provided by the MOHLTC[25]:

Step 3: Expected Unit Cost Calculation

Hospital-specific acute inpatient and day surgery unit costs are estimated using simple linear regression of unit cost against the two cost variables, i.e. ASI and rural geography. Using 2009/10 data the formula is defined as:

Expected Unit Cost =

$$\frac{[(\text{Total acute inpatient HWs \& day surgery RIWs}) \times (\$4,936 + \$93 \times \text{ASI} + \$0.77 \times \text{Distance})^{20} + \$61 \times \text{MTDs}]}{\text{Total acute inpatient HBAM weights \& day surgery RIWs}}$$

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[19] As per the definition that was used by the Ontario Joint Policy and Planning Committee (JPPC). JPPC Hospital Funding Report Using 2000/2001 Data, May 2002, page 19, http://www.ontla.on.ca/library/repository/mon/7000/10316244.pdf

[20] The coefficients in the equation, $4,936, $93 and $0.77, were generated from the regression.

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Hospital Operating Cost (HOC) and Hospital Academic Cost (HAC)[26]

In addition, the MOHLTC provides funding to numerous non-AHSC hospitals for each MTD that a learner is on a placement at a hospital to cover the costs of having learners on site. A 2006 CAHO report estimated the infrastructure and operating costs dedicated to the provision of medical education in academic hospitals to be $42.04 per MTD. (This figure does not include capital infrastructure costs associated with teaching such as the cost of building new space.) The MOHLTC used this evidence to provide selected hospitals with Hospital Operating Cost (HOC) funds to offset the cost of expansion of medical school spaces. HOC funding of $42.04 per MTD is provided to those non-AHSC hospitals that are affiliated with a medical education campus (MEC) based on the increase in MTDs relative to a base year or above a threshold of 10,000 MTDs. HOC is intended to support the indirect costs of medical education (e.g.

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[24] COFM:MTD Working Group Presentation "Health Based Allocation Model HBAM and MTD", June13, 2011
[25] HBAM Manual 2011. MOHLTC Health System Information Management and Investment Division. Note that the superscript of "20" in the formula is not an exponent, but rather a reference to a footnote in the slide.
[26] This Section taken from COFM MTD Working Group Report "Recommendations for the Collection and Reporting of Medical Trainee Days Data", November16, 2011.

additional operating costs such as gowns and gloves) and the inefficiencies arising from trainees' involvement in hospital patient care. Hospitals receiving this supplemental operating funding are detailed in Appendix C.

With the increased enrolment of learners, community hospitals outside of AHSC Alternate Funding Plans (AFPs) that provide clinical placements for medical learners were facing new operating expenses for the educational infrastructure associated with the increased numbers of learners. As part of a larger postgraduate medical education expansion process the MOHLTC provides additional Hospital Academic Cost (HAC) funding in the amount of $97.92 per MTD to offset additional administrative costs such as physician leadership stipends and secretarial support in selected MEC hospitals. Hospitals receiving this supplement are detailed in Appendix C.

HAC and HOC have been frozen at 2011/2012 levels to ensure stability of funding.

Hospital Mergers

Mergers (e.g. acute care with rehab; acute care with chronic; etc) have posed a number of challenges for the collection and reporting of MTDs. Although training is done at the site level, it is reported at the (merged) corporation level, and MTDs are not weighted by site, but are applied to the whole hospital corporation. Further, hospital service codes characterize what a learner is doing in the rotation, not necessarily the hospital-site location of the learner, and, trainees rotate frequently through hospital services throughout the year. These factors taken together mean it has been very challenging to identify the actual site of training for many trainees in order to accurately report the number of MTDs, resulting in many conflicting or duplicated records.

Recognizing that an increasing number of hospital mergers will magnify the problem, the potential to use Institution Number to differentiate site-level rotations was examined. It was determined that this code is too detailed to be practical as it drills down to the level of "bed type" which is impossible for the hospitals and schools to track. OPHRDC proposed a compromised solution to enable site differentiation which is used to different extents across the schools; however it enables OPHRDC to map submitted site names to approved Ministry standards and return the Ministry results to the schools in as specific a manner as they originally provided.

5.0   Current Approach – Medical Schools' Perspectives

Comprehensive interviews with each of the six medical schools were conducted by OPHRDC from August to September 2015 to understand their current MTD data collection processes, systems and key issues. The sections below summarize the areas of common practice, and distinct differences among the schools. Further details are provided in Appendix H.

5.1   MTD Capture – Common Practices

Thousands of trainees register with the universities each academic year, resulting in more than 100,000 training records for the whole province every year. UofT alone has 5000 trainees including undergraduate, postgraduate, elective and visiting students, and it has 28 partner hospitals. Trainees are very hard to track because they pursue training at different sites without necessarily needing to inform the administration. In addition, trainees get sick or take vacation, and administrative records may not reflect short-term absences in real-time. University administrators do track the trainees; however it is a very large volume of work, and involves numerous communications with multiple hospitals and trainees themselves. In most cases, the administrators are not dedicated solely to tracking MTDs; and often, the people recording the rotations are physicians with full research and teaching loads, because evaluations are tied to the rotation schedules.

Scheduling of Rotations

There is a basic core schedule for each program based on the curriculum requirements, but the local sites set the details within that schedule, and the Site Coordinator adds more details for specific experiences (e.g. geriatric clinics for Internal Medicine trainees, etc). Many programs run "longitudinal" (i.e. multi-site or multi-service) rotations, especially where hospitals are geographically close. For example, core Internal Medicine at UofT has 200-300 Year 1 trainees, all of whom need to complete the core Medicine training requirements, many of which require placements at multiple hospital sites over the course of the year. The completeness of scheduling is not dependent on the universities, but rather, on the hundreds of people involved at the hospital end. ROMP[27] and ERMEP[28] also provide variable inputs which the schools use to populate elective rotations. The hospitals review the MTD files, but because not all hospitals know the granularity of the rotations, most of the schools apply an algorithm to the data to account for split or longitudinal rotations.

Identification of Trainees

A major challenge in resolving conflicts in the MTD data is the identification of undergraduate trainees.   Undergraduates do not have a CPSO licence number which OPHRDC could compare to its CPSO data holdings, and so comparisons across data sources must rely on

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[27] The Rural Ontario Medical Program (ROMP) located in South-Central Ontario coordinates rotations "to alleviate the burden on communities caused by the nation-wide physician distribution problem and create learning opportunities outside academic centres and into communities". For more information, see http://romponline.com
[28] Similarly, the Eastern Regional Medical Education Program (ERMEP) "promotes and develops Distributed Medical Education (DME) in Eastern Ontario by facilitating the placement of medical learners at appropriate rural and regional sites." For more information, see http://www.ermep.com

manually matching names and Student Numbers. Name matching is fraught with problems such as inconsistent capitalization and punctuation, spelling errors, multiple legitimate names, and name changes. Student Numbers are intended to follow each student, but are often inconsistent, especially for out-of-province or out-of-country trainees. Some technical issues have been resolved by OPHRDC processes, such as obtaining UG registration data from all six schools to verify Student IDs; however challenges remain.

Visiting Electives
Data collection for visiting trainees (e.g. for electives) is almost completely a manual process. Schools across Canada are at different stages with respect to use of the AFMC portal, which in its current state it is of very little help for tracking and/or validating locations, and in fact was not designed for this purpose. Most schools collect Student Number on their application form or through the AFMC portal, but any errors are perpetuated throughout all subsequent sources. Visiting students are asked to use their home school student number but when this is not reported some schools have generated internal or "dummy" numbers to fill in the field. Efforts are being made to capture this more reliably, and the schools have been advised to leave the Student Number field empty rather than enter a dummy number.

Clinical Fellows
Fellows are also eligible for MTD claims, and pose an additional challenge for tracking as they do not follow a set curriculum. Their experiences and locations are determined between the trainee and supervisor; thus, even though they may be "registered" with one hospital, they often attend multiple locations depending on what cases the supervisor wants them to see.

Privacy and Data Sharing Consent
PGME Offices issue a Letter of Appointment (LOA) to trainees which includes consent for sharing registration and MTD data with OPHRDC and the MOHLTC. As all postgraduate trainees sign these LOAs, there are no privacy concerns.

As of September 2015, the intent was to have all incoming undergraduate trainees similarly consented; however one school's UG consent form allowed students to opt out of data sharing with specific organizations. A number of UGs from one school chose this option, meaning their records had to be removed before submission. In order to avoid this issue in the future, this school plans to revise their UG consent for September 2016, and OPHRDC will no longer collect date of birth.

Number of Days Claimed
All schools aim to account for 365 days per year for all trainees, given the cap applied at the end of the year accommodates acceptable short-term absences such as weekends, statutory holidays, vacations and illness—in general, periods of less than two weeks. The days missed during these short-term absences are included in MTD reporting. Longer-term absences of greater than two weeks (e.g. medical leave or maternity leave) are not included in the MTD submissions.

Service Codes and Programs/Specialties

The Ministry Standards include the Royal College of Physicians and Surgeons of Canada (RCPSC) and College of Family Physicians of Canada (CFPC) accredited programs (80 for the 2015/16 year plus "UGME" for undergraduates). The RCPSC and CFPC accredited specialties are the only accepted codes, and rotations submitted to MOH must be restricted to this list, which is manageable; however it has been noted that there are anomalies and local program/service codes that are not covered. For example, two schools report that choosing a service code for certain rotations is often a best guess as there are not enough Pediatric options, and one school reports that there are not enough options for Psychiatry service codes. Administrators have been directed to report the code which best fits the program and service in which the learner is enrolled, and most of the schools have constructed a mapping of their service codes to the accepted standards. The mappings are not standardized across institutions, and unless precision would create additional value for the hospitals it is unclear if a common code table would be of benefit.

Facility/Institution Codes

Site-specific information is an integral part of some schools' rotation records; often it is up to the hospital to break out these specifics during data validation, especially with visiting electives. There is consistent desire to be as accurate as possible with site-specific allocation. Some of the schools track facility site details in their own data; however these details are removed prior to MTD submission, per the most current Standards. As described in Section 4.6 above, OPHRDC is able to "translate" site level information to Ministry-approved standards, and then back to more specific information for the schools after record validation.

5.2 Distinct Processes

Systems/Platforms

The process for capture and recording of MTDs varies by medical school because they are not using the same systems or software, and some use different systems for their own UG and PG data. Three of schools use System one45, two use MedSIS and POWER, and four of the schools have additional customized MTD platforms or interfaces. All schools use multi-step transfers between systems (internally at the university, or externally when exchanging data with hospitals), and all use a variety of exports to and from Excel for data entry, exchange and reporting. No one source creates the final MTD file: the schools receive inputs from numerous sources (e.g. UG and PG Program Offices, hospitals, ROMP/ERMEP) which are then merged to create the final file for submission. The idea of a common platform across all schools, although appealing to some, does not seem feasible as each school has developed its own system and there is not enough uniformity in their processes to pursue a systemic change that is likely to be resource-intensive. In fact, given OPHRDC's role in managing the MTD data submissions according to the Standards, a common platform may not provide any additional benefit.

Rotation Blocks

Although all undergraduate rotations run from Monday to Sunday across the schools, the number of weeks per rotation "block" can vary from 1 to 8. For postgraduate rotations, four schools use Tuesday-to-Monday schedules, while two use Monday-to-Sunday schedules, and again the number of weeks per block can vary. This difference causes a huge number of "nuisance conflicts" when trainees do rotations in a hospital outside their home school's affiliated group, given the conflicting data are most frequently the result of overlapping start/end dates. One of the non-conforming schools is working on a method of shifting their data to help deal with such conflicts; the other school may make an adjustment in future but it is not a priority. It was noted that RCPSC is moving toward a competency based evaluation system, and if this occurs, rotation blocks may no longer be relevant.

Pre-Clerkship and IMG Assessment Program

Pre-clerkship (UG1 and most UG2[29]) and IMG Assessment Program rotations are not included in the HBAM funding formula, but the Ministry has requested these data be submitted for their information and research purposes. There is significant variation across the schools in how these data are collected, and there are no standards or definitions of the activities in hospital that should be counted and submitted for pre-clerkship or IMG assessment trainees. The MTD-IC is working to identify which pre-clerkship rotations should be captured, and is awaiting a Ministry definition of the IMG assessment rotations to be included.

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[29] Some McMaster UG2 rotations are included because McMaster's medical program is 3 years rather than 4

6.0   Current Approach – OPHRDC Perspective

This section provides an overview of OPHRDC data management and submission protocols related to MTD. Further details are provided in Appendixes E and G.

6.1   MTD Validation and Verification

From 2000/01 to April 2014 the MOHLTC collected and validated the MTD data, at first from transmissions from individual hospitals, then from the six Ontario medical schools on behalf of the hospitals, which involved a significant amount of time and administrative burden. The software for this function was outdated and no longer functioning well, and the MOHLTC deemed it imprudent to invest in a replacement system.

It was recognized that OPHRDC has expertise in data cleansing, validation, and management, and already had well-established data linkages and positive working relationships with the Postgraduate Offices and other stakeholders in MTD capture; therefore the MTD-IC agreed it made sense for OPHRDC to conduct the overall data validation across the schools, identifying duplications and discrepancies, and notifying the schools.

OPHRDC submitted a business case and request for funding to MOHLTC, which was approved for a two year initial period bridging three fiscal years from July 1, 2014 to August 31, 2016. The objectives are for OPHRDC to: merge data from the six schools to develop a provincial MTD database and provide reports from the data; work with the medical schools to implement a process to ensure MTD data is submitted according to the Standards; verify MTD data ensuring no duplications, errors or omissions; provide a single point of contact for queries regarding MTD data; and provide *ad hoc* reports to support physician human resource planning, research and evaluation[30].

OPHRDC receives the six files from the schools, identifies discrepancies, and informs the schools involved in a conflict over a learner so that the schools can (resolve it with the hospitals and) direct OPHRDC how to correct the errors. OPHRDC then submits the report to MOHLTC.

With OPHRDC taking on the role of synthesizing and validating the MTD data supplied by the medical schools, as of April 2014 the MOHLTC no longer provides this function. On receiving the file transmission from OPHRDC, the MOHLTC uploads the data into their system to verify that the data adhere to the required standards. The MTD project transitioned to operational mode at MOHLTC on August 1, 2015, and the Ministry project team now takes a background role, providing support as necessary.

The quality of the submission file improved substantially between Q1 and Q2 of 2014/15, as experience was gained and as effective working relationships between the schools, OPHRDC

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[30] MOHLTC-OPHRDC Transfer Payment Agreement 2015-02-18, Health Workforce Evidence & Innovation Unit (HWEIU)

and the MOHLTC team developed. For Q1 of 2015/16 there were only 8 flagged records (for 3 trainees) in the initial Ministry submission, and none in the subsequent resubmissions. OPHRDC has done extensive work making suggestions to enhance the clarity, definitions and processes outlined in the Standards document. Most of the recommendations have been accepted; those relating to specific OPHRDC requirements (e.g. trainee birthdate for confirming identity and validating MINC number) have been directed to separate communications with the medical schools because they are not Ministry requirements.

6.2   MTD Submission

Approximately 30,000 records are processed per quarter for about 9,000 trainees at 155 hospitals, via the data submissions of the six Ontario medical schools.

The schools send each quarterly file to OPHRDC three times. OPHRDC reviews the first submission for "values" (compliance with Ministry standards) and identification of trainees, and returns issues to the schools for resolution. The schools resolve these issues and resubmit the file to OPHRDC which then identifies rotation discrepancies (overlaps, duplicates, etc.) and returns the feedback to the schools for resolution. The schools work with their affiliated hospitals and the trainees to resolve conflicts in the data and submit a final file to OPHRDC. OPHRDC sends the MTD file to the MOHLTC which validates for compliance and returns any issues to OPHRDC for resolution, and resubmission of the final file.
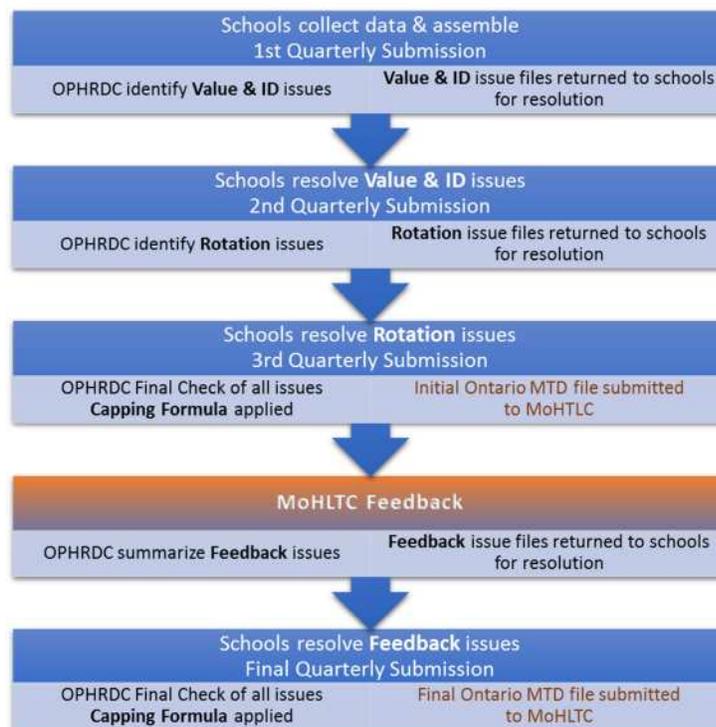
Annual Cap

The maximum number of days that can be submitted to the Ministry for a single learner across all facilities in the Annual file is 275 days. As of July 22, 2015 the Ministry agreed that all quarters will first be submitted to OPHRDC and to the Ministry with the Actual Days experienced by a trainee in a facility. The maximum number of days that can be submitted to OPHRDC in any particular quarter is outlined in the table below based on the calendar days available. After all quarters have been individually approved by the Ministry, then OPHRDC caps the Annual file for the final submission to ensure that the sum of all days reported for a single trainee does not exceed 275 days per fiscal year, and thus the cap is applied equitably across the province.

Quarter Period	Maximum Number of ACTUAL days submitted to OPHRDC and Ministry for Q1-4	Maximum Number of CAPPED days submitted to Ministry for ANNUAL file
Q1: April 1 – June 30	91.00	
Q2: July 1 – September 30	92.00	
Q3: October 1 – December 31	92.00	
Q4: January 1 – March 31	90.00* (91.00 only for 2016)	
Total	**365**	**275** (276* for 2016)

*February 29 is an extra day in the 2015-2016 MTD year, which means the cap for Q4 and 2016 is augmented by 1 day.

Trainee Identification

The biggest challenge to date has been trainee identification, particularly undergraduates and visiting electives, which often requires manual look-up and name matching. Further, there is no reliable way to link UG and PG data. MINC will ultimately be the way to have full confidence in the data and identification of trainees. Use of MINC should resolve most PG and UG identification issues, and will allow UG and PG records to be linked across the MTD data. Ultimately, OPHRDC could require one less submission per quarter from schools if the values and identification issues can be consolidated with rotations issues[31].

Conflict Resolution

The time spent resolving conflicting records is a common concern for all schools. OPHRDC proposed a conflict resolution process to the MTD-IC on September 30, 2015 in order to better standardize the process:

- Determine the correct rotation data
  - The gold standard is the trainee's verbal or e-mail confirmation
  - If this is not possible, use the hospital's records or preceptor evaluations
  - If these are not available, use the school's elective request or master schedule
- Identify which school has responsibility to resolve the conflict

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[31] From OPHRDC Presentation to MTD Debrief Day, June 11, 2015

- If the home school (School Attended) is involved in the conflict, that school contacts the trainee to determine where s/he actually was, notifies the other school(s), and any necessary changes (or appeals) are made.
- If the home school is out of province/OOC, or is not involved in the conflict, then:
    o The school with the earliest start date initiates the conflict resolution.
    o If conflicts start on the same date, then the school with the longest rotation is responsible.
    o If conflicts start and end on the same dates, then the alphabetically first school is responsible.
- Clarify how changes are made to conflicted records
    o The Submission School makes any necessary changes to their own records.
    o Other schools involved in the conflict are encouraged to note agreed-upon changes, but OPHRDC can only process changes from the Submission School for that record.

Based on feedback from Q1 and Q2 of 2015-16, this process has already provided benefit.

7.0 Issues/Gaps

Although the timelines and process for MTD collection and submission are much improved and moving toward being an established system, there remain several key issues for resolution. As some issues must be addressed by the Ministry, and others by the schools or hospitals, or a collective effort to develop solutions, it is suggested that the MTD-IC review the various items and agree on an approach with the various involved parties.

1.   Time and Resource Requirement

Given there are up to 80 accredited programs at 150+ hospitals/institutions for several thousand trainees every year, the magnitude of the data management, validation and conflict-resolution tasks involved in tracking rotations is clear. The MTD project draws considerable talent from the existing PG, UG and IT workforce at each medical school, and from hospital administrators. All schools reported a significant proportion of staff time (estimates varied from 20 to 90 percent, plus overtime) was redirected to the MTD project in the pilot year, and absorbed by individuals whose work schedules were already demanding. Some have created new positions and hired people specifically for MTD; however this is not possible for all the schools given there are no additional resources. Even though the first full-year cycle of the new process is now complete, the time required for MTD processing is expected to remain substantial, and a key challenge.

2.   Value of MTD

The hospital funding formula is complex including many more factors than MTD; and, the value of an MTD varies by hospital and service, depending on the hospital volumes, acuity of cases, and type of care and service provided. The regression equation does not translate a specific amount for "MTDs" directly into a line item in a hospital's budget; and, the question of whether certain service codes generate more value than others, or are completely discounted has not yet been answered. Further, while not specific to MTD adjustments, there is a two-year lag in the MTD data being applied to the HBAM formula. Without some understanding of the value of an MTD—even a range such as min-max—the stakeholders in the medical schools, OPHRDC, and the hospitals are operating in something of a knowledge vacuum, expending considerable resources across multiple offices to track information and resolve conflicts without any idea of whether the effort/cost expended is greater than the value ultimately realized[32].

In addition, the Ministry has indicated it wants to understand trends in medical education, and better understand how UG1 and UG2 training occurs in hospitals, and so it requested these data be collected. Hospitals have also requested that MTD data be collected for UG1s and UG2s for validation and/or funding purposes. UG1, UG2 and IMG Assessment Program rotations are not included in the funding formula (except some UG2s at Mac) but tracking them still requires resources. The schools need to be able to manage their resources efficiently, as

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[32] Note: since time of writing, the Ministry has provided an updated value of an MTD of $66 for fiscal 2014/15 for the acute inpatient care type. No dollar value has been calculated for the other four care types.

MTD-tracking is not their only activity, and they do not get additional funds for it. These questions have been raised in meetings with the Ministry multiple times advocating for transparency, but information has not yet been provided.

3. Trainee Identification and MINC

As described in Section 5, the confirmation of student identities, particularly undergraduates and visiting trainees, is time-consuming, prone to error, and often relies on manual matching of names. Use of the MINC will resolve the UG identification challenges, but has been problematic to implement given past concerns about student consents and lack of a coherent process or accountability for obtaining MINC numbers *en masse*. Collection of MINC has not been mandatory to date in Ontario, but *is* assigned through the regulatory College of every other Canadian province. Currently in Ontario all UG4 (and Mac's UG3) students are issued a MINC on completion of the MCC exams, and there is agreement that all incoming UG1 students in 2015/16 and onward will be required to register for a MINC on the MCC[33] website. In order to fill in data gaps as much as possible, for the 2015/16 year UG2 and UG3 students have been asked to register for a MINC but their compliance has so far been sporadic, meaning the MINC data field may be incomplete for up to two years. There will still remain a gap in MINCs for out-of-country trainees as there is not yet a clear process in place to ensure undergraduates obtain a MINC before their rotations begin, and, Fellows who did not need to write MCC exams did not receive a MINC automatically. The schools anticipate difficulty requiring out-of-country Fellows to apply for MINCs, and so the 2016/17 Submission Standards will allow MINC to remain optional for Fellows only. Gaps in MINC data will perpetuate the need for manual processes to confirm identities, wasting resources and causing delays.

4. Scheduling and Administrative Issues

Only four of the schools have a common postgraduate rotation schedule from Tuesday to Monday, and two have a Monday-to-Sunday schedule. It is estimated that up to 25% of the inter-institutional conflicts arise from overlapping Start/End dates due to this difference. Such "nuisance conflicts" remain a time-consuming challenge, and a common method across schools for resolving them in a timely manner is required. One of the non-conforming schools is working on a method of shifting their data to help deal with such conflicts; the other school may make an adjustment in future but it is not a priority.

A variety of administrative challenges are out of the direct control of the schools. The completeness of scheduling is not dependent solely on the universities, but on hundreds of hospital administrators across the province. Each program has a core set of curriculum requirements, but the local sites establish the exact rotation details and the Site Coordinator adds further specific experiences. Further, although the process requires PG elective students to register with the PG Office, it is quite possible for e.g. a Mac trainee to connect with a

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[33] With its key stakeholders, the Medical Council of Canada:
- Develops, validates and implements tools and strategies to evaluate physicians' competence; and
- Maintains a national registry of physicians and their qualifications throughout their professional careers.

preceptor at Trillium to do an elective without it occurring to either to register at the UofT PG Office. PG trainees have a licence and CMPA insurance coverage, and therefore there is no reason for them to think of stopping in at the PG Office. Similarly, electives are often set up with very little notice, and changes often occur the day the rotation is expected to start. All of these administrative issues further complicate the process of tracking rotations and MTDs.

5. Data Issues

Technical staff have described the inefficiency of correcting the conflicting data via multiple and time-consuming phone calls, when it may be that problems could be identified and solved at the point of entry (i.e. with common data mapping in addition to the Standards).

Program and Service Codes
Currently, hundreds of hospital service codes must be matched to 81 specialty/program codes accepted by the MOHLTC Standards, resulting in frustration at the local level as administrators must spend time trying to identify the best service code to use in absence of an exact match. In some cases, a "best guess" approach is the best possible solution, and it is likely that some of the mappings could vary across schools and hospitals. While this resolves the short term need to fit the rotation data into the Standards, there remains the possibility that there are limitations on the accuracy of the data at its most granular level, which may have implications on planning initiatives. However without knowledge of the impact of specific service codes on MTD in the funding formula, it is not clear if additional precision would add value, and the MTD-IC is awaiting response from the Ministry's Health System Funding department on this issue.

ROMP and ERMEP
ROMP and ERMEP data are based on self-reported information from students which is then entered into spreadsheets and transmitted to the schools. The data are generally described as inconsistent, incorrect, and not granular enough to enable effective linkage and validation. Such deficiency in the input data imposes significant time requirements on the whole validation process. Further, communication of these rotations has been incomplete and unreliable. This has been attributed to software challenges which are being addressed; however a timeline for the software improvement has not been specified.

6. Partial Days

Fractional MTDs are allowed, and accepted in cases where a trainee works less than a full shift, or attends more than one training site per rotation block. Half-days, academic-days, and multi-site rotations are often accounted for by formulas or percentages to offset the intensity of the administration/counting. As a result, there could be potential limits on the accuracy of the data at its most granular level, which may be a consideration for planning purposes.

7. Communication

With the large number of people involved in MTD tracking across the province, it is not surprising that there have been numerous instances over the course of project development when information was not available, miscommunicated, or when changes have been made without consultation.   For example, the approval or decline of requested changes to standards has not been communicated effectively or directly in the past, relying on users to check postings to the Ministry's www.hsimi.on.ca website, which many stakeholders were not familiar with or approved to access. A number of changes to requirements, processes or timelines were enacted without sufficient prior consultation that might have spared some effort or repetition. The MOHLTC has acknowledged communications problems of the past, and confirmed its commitment to work in partnership with the schools and hospitals. To this end, the MOHLTC is working to determine what kind of information, updates and communications would be significant to hospitals and schools.

8. Issues Management and Appeals

Issues Management has historically been done on an *ad hoc* basis. The creation of the multi-partite MTD-IC is a step forward in compiling items to address, and the Ministry has expressed its commitment to develop an Issue Log, but there is currently no formalized appeals process when decisions about standards, processes, or funding amounts are in dispute. Some stakeholders recall there used to be an appeals process that seems to have dissipated without communication. An issues management process is important for bringing matters forward for resolution in a timely manner while regular work continues in background. Some issues pending decision have implications on the next series of work, so a mechanism for timely resolution is important in avoiding any further delays. Similarly, an appeals process is required to ensure transparency and fairness in decision-making.

8.0   Recommendations

This section makes suggestions for dealing with some of the issues and challenges identified in Section 7.0. They are ideas and recommendations to work towards; they do not represent decisions already taken. For easier reference, the recommendations have been divided into two categories: those requiring higher level policy-based discussions (Section 8.1); and, those of a more procedural or technical nature (Section 8.2).

8.1   Policy Recommendations

1. Evolve the MTD Implementation Committee to an MTD Steering Committee (MTD-SC)

With the completion of the pilot year, the MTD Implementation Committee could be transitioned to more of a governance role, such as that of a Steering Committee. Appropriate Terms of Reference should be developed that could include the following functions:
- oversee issues that arise, and facilitate appropriate and timely action and/or escalation;
- ensure and facilitate consultation with stakeholders prior to process or standards changes;
- ensure clear, regular and effective communications with stakeholders; and
- conduct regular review and updates of MTD policy decisions.

At time of writing, this transition is now in process, with Terms of Reference being developed, and timing to be agreed upon by the parties involved.

2. Formalize an Issues Management Process

In the "project year", the communication, discussion and resolution of problems had to be dealt with on an *ad hoc* basis as issues arose. A working group or subcommittee of the new MTD-SC could be formed to capture and maintain the issues log, discussion, action, and eventual solutions. Current concerns could be dealt with in timely fashion, and potentially, a proactive approach to issues management would also be feasible. Results could be included as an Appendix/Addendum to the overall MTD Protocol document.

3. Develop an Appeals Process

Similarly, a subcommittee of the MTD-SC with representation from all stakeholders could take on the function of defining a procedure for appeals.   With a proper Appeals Process in place, items in dispute could be forwarded to those with authority to approve changes or mitigating circumstances, or identify the appropriate pathway for escalations, etc., independent from regular work which could be continuing in background. Further, an Appeals Process is important in establishing transparency and fairness for all stakeholders.

4. Formalize the agreement and operational funding for continued OPHRDC involvement

Leveraging OPHRDC's expertise in data cleansing and linkage has dramatically reduced the time and effort spent by the MOHLTC in validation and has significantly improved MTD data quality. A positive and productive working relationship has developed among all stakeholders, attributable in part to OPHRDC's involvement as a centralized hub. OPHRDC has proved to be an effective intermediary in developing and implementing practical solutions to improve the efficiency of the data collection process and the accuracy of the MTD data. The Ministry should consult with OPHRDC when developing system specifications or modifying the MTD process or Standards, as OPHRDC is closest to the global data set and can provide perspective on the impact of changes and valuable input on potential solutions. Further, the savings achieved in the hospital sector and MOHLTC by OPHRDC and the schools doing the validation could be reinvested into OPHRDC's continuing involvement in MTD data management.

5. Communicate the value of an MTD

Extensive time and staff resources have been spent across the universities and hospitals in documenting rotations and resolving conflicts, yet this has been done somewhat blindly, as there is no one fixed value of an MTD. It is acknowledged that the hospital funding formula is complex and relies on many more factors than MTDs. Further, the value of an MTD varies across hospitals according to their volumes, services, and type of care provided (e.g. acute, rehab, mental health, etc.) However, there must be more information provided to the schools and hospitals in order to promote efficient operations. For example, it is a typical scenario that several staff in the PGME or UGME or IT offices could be involved in resolving conflicting rotations among their affiliated hospitals (who would also expend staff time in this exercise) over a period of days. If the value of the conflict resolution they are all pursuing is say, $61, then undeniably the cost of the efforts expended have far outweighed the dollar value recouped in resolving the conflict. At the very least, a reasonable value range, or upper and lower limits by a few key services or hospital types, should be made available[34]. In addition, it may be appropriate to invite someone directly involved with the HBAM model at a large hospital to an MTD-IC meeting to explain HBAM funding and provide the committee with sufficient understanding of the importance and impact of MTDs on hospital funding.

6. Move toward a Common Rotation Block for all schools

As previously discussed, a significant proportion of inter-institutional conflicts are caused by different rotation schedules across the schools. Although all acknowledge the difficulty this causes, it may not be practical or feasible for the two "outlier" schools to convert to a different system in the short term, but they are willing to raise the issue for discussion, and at least one of them is trying to shift their data to help deal with conflicting records. In the meantime, OPHRDC has proposed that a common policy be developed to resolve one-day overlaps caused by varying start/end dates, and the schools are amenable to adopting a policy of either splitting the

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[34] Note: since time of writing, the Ministry has provided an updated value of an MTD of $66 for fiscal 2014/15 for the acute inpatient care type. No dollar value has been calculated for the other four care types.

overlap between the schools or awarding it to the home school. Further research on the impact of each approach is required so that a formal recommendation can be made to the MTD-IC.

8.2   Procedural/Technical Recommendations

7. Maintain and update the Standard Operating Protocol/Procedures

The Standard Operating Procedures are documented in detail in Appendixes E and F.   Keeping them current is a vital and ongoing activity that requires assigning staff resources to this task. The Ministry and OPHRDC could work together on defining/updating standards, specifications, submission timelines and communications. If OPHRDC is in attendance at meetings where decisions are made, it could be the keeper of the protocol which should be a "living" document with due process for consideration, approval and auditability of changes.

8. Establish a Technical Working Group

Many technical issues were resolved in the pilot year; however a number of technical elements remain to be implemented, and this should be approached in a collaborative effort among the stakeholders to ensure efficient time and resource management, while respecting the submission standards. Further, consideration should be given to anticipating future technical requirements in an effort to minimize the need to react to changes in the short term, and the associated frustration and waste of resources this typically causes. The MOHLTC, schools, OPHRDC and hospital partners could work together on opportunities to improve existing processes and enhance MTD data quality.   A Technical Working Group that reports to the MTD-SC could also be tasked with some of the items described below.

9. Implement a process to require and collect MINC number for all trainees

The need for auditable data requires the ability to reliably identify individual trainees, which has been a challenge when trainees move about institutions because of different student number formats and incorrect or missing data. A process to obtain and use MINC number should be a priority toward reducing repetition and manual processing to confirm students' identities, and OPHRDC should be the lead as it is licensed to use MINC. Once established uniformly, MINC will become a valuable tool for evidence-based, longitudinal, national tracking and policy making with respect to student and physician migrations and eventual practice locations. These objectives are shared by multiple stakeholders, including the MOHLTC and the medical schools.

10. Develop and implement a standard mechanism for data collection

Although there are data standards in place, there is not a standardized approach to data collection across the system. A variety of inputs are received in different formats across the schools. Some of this cannot be changed as it is not feasible at the current time to move to a common platform. However, there are elements where a uniform approach to data collection for the province may be possible, and where OPHRDC could take the lead.

For example, it may be possible to suggest a common format and timeline for receipt of ROMP and ERMEP data, and ROMP has committed to better reporting for upcoming cycles. ROMP and ERMEP could have a role in providing MTD data to hospitals and/or schools in a brokerage function, but this role has yet to be defined. Similarly, data collection for visiting electives is neither dependable nor efficient, and current resources are not able to capture this cohort in a consistent and reliable format. A common approach to use of the AFMC Visiting Electives Portal once it becomes operational may offer an improvement. Further, it would make sense for the schools to harmonize their process for consenting UG trainees--specifically the consent form, and it is recommended there be a shared mechanism for ensuring commonality.

Finally, considerable time and effort are expended in capturing the required MTD data elements within existing resources. It is recommended that only the elements necessary to support the funding purpose are collected, and not elements that may be interesting for future research as there are resource implications for pursuing additional, non-essential elements. Where additional data collection is deemed necessary, consideration should be given to the associated administrative burden and to developing a formulaic approach where reasonable. For example, UG1 and UG2 rotations could be accounted for by asking the UG Deans to estimate the number of days such students typically spend in hospital for clinical activities, and a percentage could then be applied to capture this time.

11. Establish a common dictionary of Program, Service and Facility Site Codes

The current set of accepted Program/Service codes is based on the specialties accredited by the RCPSC and CFPC; however more granularity is needed to identify rotations through specific hospital services. Similarly, many schools require the ability to identify specific Facility Sites, but not at the detailed Master/Institution Number level which drills down to actual bed/care type. Further, although the time periods and number of days are accurate, some of the mappings of services are necessarily arbitrary, and could vary across schools and hospitals. Allowing further granularity of the data supports the Ministry's priority of "evidence based" funding[35] but this must be balanced with consideration of administrative burden, ensuring that further precision actually adds value.

For example, one school (Mac) has mapped 500 codes to the accepted service codes. This map could be shared among the schools as a starting point to develop an initial complete list of services/codes for the current year. However, as the schools have already mapped their own programs to the Ministry's codes, they prefer that this not be revised unless hospital funding is impacted. If deemed feasible, OPHRDC could coordinate the aggregate file and identify issues for resolution. For such an aggregate file to be useful, the schools must agree to use the same master table, and work with their affiliated hospitals to ensure new codes are not assigned in isolation. The MOHLTC could review the aggregate file to gain better understanding of the service level data and determine the feasibility of changes to the Standards (see Section 4), and it could still use the mapping to the 81 accredited specialties for its reporting purposes. Finally,

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[35] MOHLTC has expressed its objective for evidence-based funding, and acknowledged (June 11, 2015) that service codes should be mapped properly to the actual service.

there must be a process established to manage additions or changes annually in advance of the next academic year, so that new codes can be accommodated prior to file submissions.

12. Develop and implement Communication Initiatives

Given the large number of partners in the MTD initiative, clear and regular communication is essential. All stakeholders should have access to the same information on the same timeline. Changes to standards must be communicated proactively, in addition to postings on the Ministry's website. In future, approved/declined changes should be communicated directly to the universities and hospitals. The Ministry has committed to issuing e-mail notifications of MTD-related website updates to all stakeholders for the 2016/17 year.

The Ministry has cited its goal to streamline a communication process that is hospital-centric. The MOHLTC, schools, hospitals and OPHRDC should have open communication lines and encourage dialogue. When conflicts are being resolved it is imperative that inter-school communication continue to be open and productive. OPHRDC may be able to provide a brokerage function in this regard.

13. Consider implementation of Observed Best Practices where feasible

During the interviews with the medical schools, a number of best practices were observed which were beneficial in their management of the MTD process, and are included here for consideration where feasible:
- Designated staff:
    - to manage MTD communication, uploads and timelines (could be an IT person)
    - to manage MTD conflicts (one in UG and one in PG)
- Data collection:
    - use single file type, location and process for each of UG, PG and Visiting Electives
    - provide standardized rotation schedules for data collected from schools: e.g. a rotation identifier which indicates program/service/facility codes and/or time percentage
    - provide locked Excel template for data collected from hospitals with dropdowns to allow only MTD-appropriate options
    - when student numbers are not available, leave field blank (do not generate dummy numbers)
- Data processing:
    - determine deadlines for each step of process, communicate early to school and hospital staff
    - link MTD data to other processes (budget/payment) to motivate speed and accuracy
    - track changes to data over time; record and rank data source
    - develop an MTD platform which automatically flags duplicates, gaps and rule violations.

9.0   Final Comments

After a very challenging project year, and considerable effort by all parties, the MTD project transitioned to operational mode at MOHLTC on August 1, 2015, meaning the Ministry project team now takes a background role, providing support when necessary. This should be viewed as a remarkable achievement given the massive undertaking to coordinate more than 160 institutions in less than a year to implement a new process which has implications for funding.

The quality of the MTD submission improved substantially as experience was gained and as effective working relationships between the schools, OPHRDC and the MOHLTC team developed. The partnership between the medical schools and their affiliated hospitals in collecting the rotation data has been beneficial in reducing conflicting records. Leveraging OPHRDC's expertise in data cleansing and linkage has dramatically reduced the time and effort spent by the MOHLTC in validation and has significantly improved data quality. Consider that approximately 30,000 records are successfully processed per quarter for about 9,000 trainees at 155 hospitals. More than 100,000 training records were processed for the 2014/15 year, and for Q1 of 2015/16 there were only 8 flagged records in the initial submission, and none in the subsequent resubmissions.

OPHRDC has done extensive work making suggestions to enhance the clarity, definitions and processes outlined in the Standards document. Most have been accepted and implemented. Thus it is clear that OPHRDC is involved as a valuable partner providing credible and practical inputs into coordinating and improving the overall process. A stabilized data collection and validation process translates to greater confidence in the data, improved efficiencies, and better resource utilization.

As with any evolutionary process, there will remain a few challenges to address over time. For example, even with OPHRDC's involvement, the time and resources required to administer MTDs at the school and hospital ends remains high, and must be monitored. Communication of information is important, particularly regarding the impact of MTDs on hospital funding, and any planned modifications to systems, standards or timelines. Attention should be paid to continuously improving data and methods, seeking areas for a common approach where feasible, and regularly updating the Protocol.

This report outlines a number of suggestions for policy and procedural enhancements to improve the MTD experience overall. Establishing a governance role for an MTD Steering Committee, and a small number of functional subcommittees for Issues Management, Appeals, and Technical issues will contribute to smooth operations and foster a more proactive approach to system management. Pursuing common approaches to data management balanced with understanding of resource implications will contribute to improved efficiency. Over time, and with increasing confidence in the MTD Protocol, it may be possible to eventually transition to a more streamlined process in future.

List of Appendixes

Appendix A – Glossary of Acronyms

Appendix B – References

Appendix C – Hospital Funding Background

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Appendix E – OPHRDC Data Handling Protocol, January 22, 2016

Appendix F – MOHLTC "Medical Trainee Days Submission Standards, Version 2015 10.2 Final, August 11, 2015" – file attached separately

Appendix G – Presentations to MTD Debrief Day June 11, 2015 – folder will be provided for posting to OPHRDC website

Appendix H – Medical Schools' Data Management Processes – file will be provided for posting to OPHRDC website

Appendix A: Glossary of Acronyms

Acronym	Full Term
AFMC	Association of Faculties of Medicine of Canada (formerly ACMC—Association of Canadian Medical Colleges)
AFP	Alternate Funding Plan
AHSC	Academic Health Sciences Centre
ASI	Acute Specialization Index
CAHO	Council of Academic Hospitals of Ontario
CaRMS	Canadian Resident Matching Service
CCAC	Community Care Access Centre
CCIM	Community Care Information Management
CFPC	College of Family Physicians of Canada
CIHI	Canadian Institute for Health Information
CMPA	Canadian Medical Protective Association
COFM	Council of Ontario Faculties of Medicine
COU	Council of Ontario Universities
CPSO	College of Physicians and Surgeons of Ontario
DAD	Discharge Abstract Database
DME	Distributed Medical Education
DSRWG	Data Standards Review Working Group of MOHLTC
DSU	Data Standards Unit of MOHLTC
ERMEP	Eastern Regional Medical Education Program
FMRAC	Federation of Medical Regulatory Authorities of Canada
HAC	Hospital Academic Cost
HBAM	Health Based Allocation Model
HDB	Health Data Branch of MOHLTC
HOC	Hospital Operating Cost
HSRF	Health System Funding Reform
HWEIU	Health Workforce Evidence & Innovation Unit
ICES	Institute for Clinical and Evaluative Sciences
IM/IT	Information Management/Information Technology
IMG	International Medical Graduate
JPPC	Joint Policy and Planning Committee
LMCC	Licentiate of the Medical Council of Canada
LOA	Letter of Appointment
LOC	Level of Care
MAC	Management Advisory Committee of MOHLTC
Mac	McMaster University
MCC	Medical Council of Canada
MCCQE	Medical Council of Canada Qualifying Exam
MEC	Medical Education Campus
MedSIS	Software by Knowledge4You that manages undergraduate administrative data
MINC	Medical Information Number for Canada
MOHLTC	Ministry of Health and Long-Term Care
MTD	Medical Trainee Day

MTD-IC	Medical Trainee Day Implementation Committee
NACRS	National Ambulatory Care Reporting System
NOSM	Northern Ontario School of Medicine
OCOTH	Ontario Council of Teaching Hospitals (now CAHO)
OHA	Ontario Hospital Association
OMSAS	Ontario Medical Schools Application Service
OPHRDC	Ontario Physician Human Resources Data Centre
PARO	Professional Association of Residents of Ontario
PG	Postgraduate
PGME	Postgraduate Medical Education
PGO	Postgraduate Office
PGT	Postgraduate Trainee
PGY	Postgraduate Year (typically followed by a number indicating trainee level)
POWER	Software by Knowledge4You that manages postgraduate administrative data
QBPs	Quality Based Procedures
RCPSC	Royal College of Physicians and Surgeons of Canada
ROMP	Rural Ontario Medical Program
UG	Undergraduate
UGME	Undergraduate Medical Education
UGO	Undergraduate Office
UofT	University of Toronto
UWO	University of Western Ontario

Appendix B: References

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Appendix C: Background: Hospital Funding for Teaching Role in Ontario

Health System Funding Reform (HSFR)

In January 2012, the government introduced Ontario's Action Plan for Health Care[36]. The plan would move Ontario's health care system away from a global funding system to a Health Based Allocation Model (HBAM) that attempts to tie funding to expected patient care needs, with a small portion remaining as global funding to cover facility level operating costs. To prevent dramatic swings in a hospital's budget as the sector makes the transition to the new system, the government can cap how much an institution's funding can increase or decrease.

Under the new model, Ontario's hospitals, Community Care Access Centres (CCACs) and Long-Term Care Homes are compensated based on number of patients, types of services delivered, the evidence-based quality of those services, and the specific needs of the broader population they serve.

- Frequently Asked Questions
- A Primer on Health System Funding Reform

HBAM is being phased in over a period of several years that began on April 1, 2012. As of 2015/2016, HSFR will comprise 70 per cent of the funding envelope provided to hospitals with the remaining 30 per cent based on global funding.

There are two key components to HSFR:

- Organizational-level funding (comprising approximately 40 percent of HSFR allocation): Funding is allocated to hospitals and CCACs using HBAM (i.e. tailoring their budgets to the number of patients they treat, population characteristics of their catchment areas, and the kinds of services they provide).
- Quality-Based Procedures (comprising approximately 30 percent of HSFR allocation): Funding is allocated to specific procedures (e.g. hip and knee replacements and cataract surgeries) based on a "price x volume" approach. This involves providing evidence-based allocations to targeted clinical groups. The price is structured to provide an incentive and adequately reimburse providers for delivering high-quality care.

The government reports the main benefits of HSFR to be:

- Patient-centred care, which will focus on individuals and ensure that funding is tied more directly to the quality care that is needed and will be provided
- Smarter use of limited resources, which will drive a sustainable health care system based on quality

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[36] http://health.gov.on.ca/en/pro/programs/ecfa/funding/hs_funding.aspx

However the model is not without concerns, for example: "The new funding formula will reward better-performing hospitals by giving them more money for treating patients more efficiently. It will also match funding to the population of a community as well as the age of people within that area. This will be good news for hospitals serving growing or elderly populations, which will receive more funding. But it is liable to be less positive for hospitals in smaller regions and rural Ontario, which could end up with less funding."[37]

Hospital Operating Cost (HOC) and Hospital Administrative Cost (HAC)[38]

In addition, the MOHLTC provides funding to numerous non-AHSC hospitals for each Medical Trainee Day that a trainee is on a placement at a hospital to cover the costs of having learners on site. Funding for HOC and HAC was established to support additional costs of medical education at eligible hospitals during Ontario's rapid expansion of learners in non-AHSCs. HOC funding of $42.04/trainee/day is intended to support indirect costs (e.g. inefficiencies arising from trainees' involvement in patient care) and additional operating costs such as gowns and gloves. HAC funding of $97.92/trainee/day is intended to offset additional educational infrastructure costs such as physician leadership stipends and secretarial support. HOC and HAC funding commenced in 2010/11, and to recognize the growth in teaching at each hospital, funding levels were determined by the number of MTDs reported in 2009/10 above a pre-determined baseline level for each site or above a threshold of 10,000 MTDs. The MOHLTC considered whether to use 2011/12 MTD data to reflect more recent teaching volumes in HAC/HOC funding levels, and HAC/HOC funding have been frozen at 2011/2012 levels to provide stability in funding.

Hospitals receiving the supplemental HOC	Hospitals receiving the supplemental HAC
Cambridge Memorial Hospital	
Fergus Groves Memorial Community Hospital	
Grimsby West Lincoln Memorial	
Guelph General Hospital	
Homewood Health Centre	
Kitchener Grand River Hospital	
Kitchener St. Mary's General	
North York General Hospital	North York General Hospital
Ottawa Hospital Montfort	Ottawa Hospital Montfort
St. Catharines Niagara Health System	
Sudbury Regional Hospital	
Thunder Bay Regional Health Sciences Centre	
Toronto East General Hospital	Toronto East General Hospital
Toronto St. Joseph's Health Centre	Toronto St. Joseph's Health Centre
Trillium Health Partners	Trillium Health Partners
Windsor Hotel-Dieu Grace Hospital	
Windsor Regional Hospital	

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[37] http://www.theglobeandmail.com/news/politics/ontario-hospital-funding-changes-to-favour-growing-communities/article534676/

[38] This section taken from Ministry Communication (HFO Letter HLTC 2968IT-2012-635) dated Feb 4, 2013, signed by Jeff Goodyear.

Appendix D: Medical Information Number for Canada (MINC)

MINC is the Medical Information Number for Canada, a unique, national identifier for all individuals entering the Canadian medical education or practice system.

From http://www.minc-nimc.ca How are MINCs assigned to individuals?
o Every individual entering any aspect of the Canadian medical education or practice system is assigned a MINC on their first entry to the system. Undergraduate students, postgraduate trainees, applicants to the MCC exams and physicians of any registration status in any province or territory are all assigned a MINC.
o An individual applying for registration with a medical regulatory authority in any Canadian province or territory will be assigned a MINC at the time of registration.
o An individual without a MINC who applies to a MCC exam will be assigned a MINC at that time.
o An International Medical Graduate will be assigned a MINC when they apply to an MCC exam.
o A Medical Identification Number for Canada (MINC) is:
   ▪ a unique identifier assigned to all individuals entering the Canadian medical education or practice system;
   ▪ a serial number with no encoded information other than country and profession;
   ▪ nationally recognized; and
   ▪ supported by the Medical Council of Canada (MCC) and the Federation of Medical Regulatory Authorities of Canada (FMRAC).
   ▪ A MINC is comprised of 12 characters:
   ▪ a two-letter country code (e.g., **CA** for Canada);
   ▪ a two-letter profession code (e.g,. **MD** for physicians);
   ▪ a seven-digit serial number with no encoded information; and
   ▪ a final digit generated by mathematical formula as a check for transposition errors.
o A sample MINC looks like this: **CAMD-1234-5679**

Appendix E: OPHRDC MTD Data Handling Summary

Version 1.5, revised January 21, 2016

Prepared by Cynthia Mech at OPHRDC. Unedited by Author of this MTD Protocol Report.

Purpose

OPHRDC's role in Ontario's MTD data cycle is to ensure data quality and compliance with the MTD Standards, so that ultimately, the Ministry funding team is provided with accurate, quality MTD data. OPHRDC's goals in facilitating the data review process are to provide consistency and fairness in MTD reporting across the province and across the quarters, as well as to reflect the actual rotations experienced by medical trainees and the actual rotations provided by facilities as accurately as possible. The manner in which OPHRDC accomplishes this role and these goals continues to develop in response to issues as they arise.

The purpose of this document is to summarize both the process and the protocols with which OPHRDC manages the MTD data.

Process

Ontario medical schools (Submission Schools) receive quarterly MTD data from and verify data with hospitals (Facilities) in their catchment area. This data is cleaned by the schools and then submitted to OPHRDC, who processes and submits it to the Ministry by quarter for approval. Once all 4 quarters have final Ministry approval, the quarterly files are merged and capped, and one final annual file is submitted.

MTD data is received from each school as an Excel spreadsheet, imported into Access for processing, and then exported back to Excel for feedback to schools or submissions to the Ministry. OPHRDC submits to the Ministry only MTD data which has originated from or been verified by the Submission Schools (except for cases which are clearly identified in the later Protocols section). All data is transmitted through OPHRDC's secure ftp site.

As can be seen in the sample timelines table below, there are key timepoints in this process, which are circulated to all parties at the beginning of each new MTD year.

Quarter	Submission due to OPHRDC	Submission due to Ministry	Initial Ministry Approval	Changes due to OPHRDC	Final Ministry Approval
Q1 April 1, 2016 - June 30, 2016	October 3, 2016	December 5, 2016	December 16, 2016	February 17, 2017	March 30, 2017
Q2 July 1, 2016 – Sept. 30, 2016	December 5, 2016	February 6, 2017	February 20, 2017	March 20, 2017	April 28, 2017
Q3 Oct. 1, 2016 – Dec. 31, 2016	February 6, 2017	April 4, 2017	April 18, 2017	May 5, 2017	May 29, 2017
Q4 Jan. 1, 2017 – March 31, 2017	April 28, 2017	June 1, 2017	June 7, 2017	June 14, 2017	June 19, 2017
Annual File	N/A	June 19, 2017	June 21, 2017	June 27, 2017	June 30, 2017*

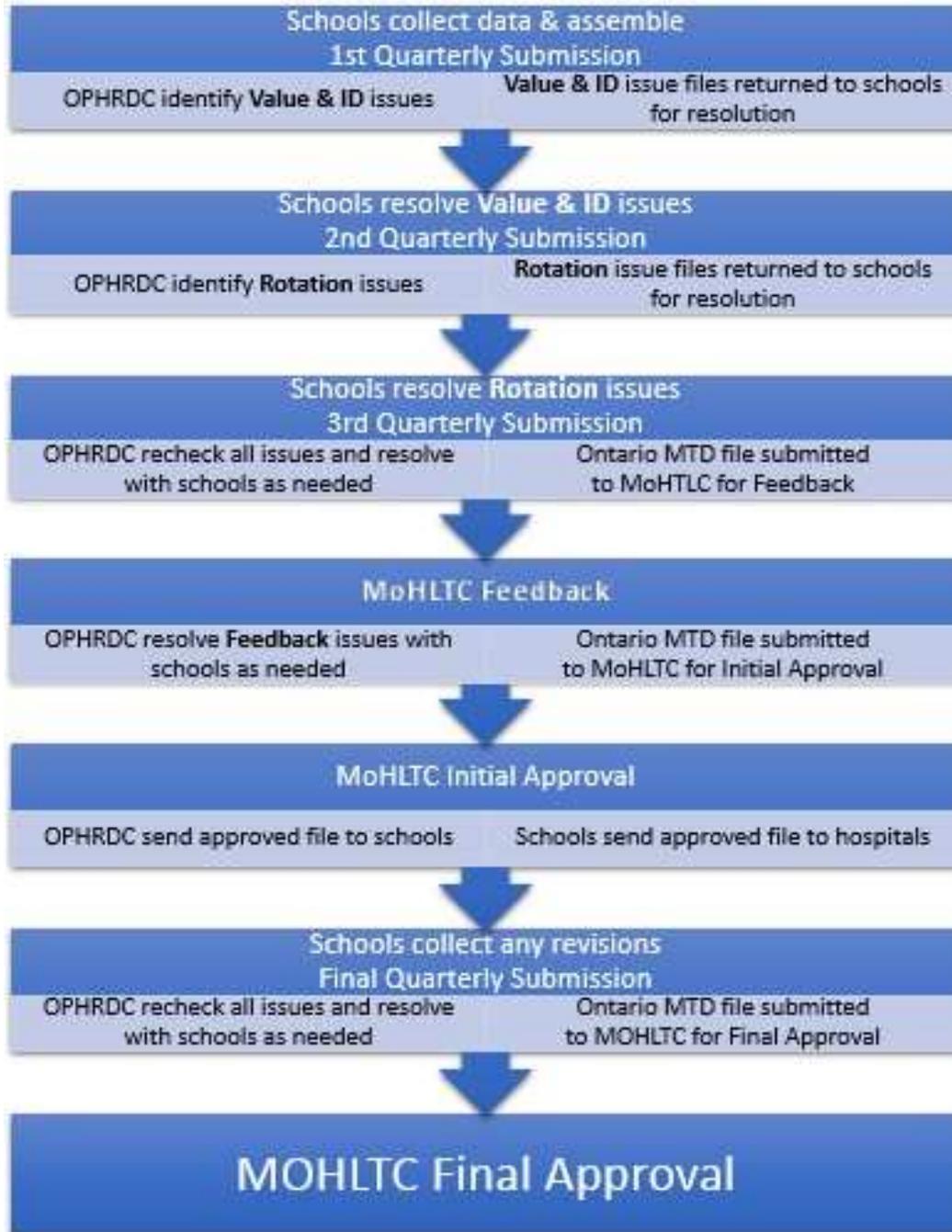There are obviously multiple steps between each of these key timepoints.

- During the quarter itself, schools and facilities are tracking scheduled and attended rotations for each medical trainee.
- As soon as the quarter is finished, that information is compiled and checked by the schools before submission to OPHRDC.
- OPRHDC similarly compiles and checks the information submitted by the schools before submission to the Ministry.
- The Ministry then checks the information submitted by OPHRDC before providing Initial Approval (which causes an initial lock of the database).
- OPHRDC shares the approved data with all schools, who in turn share the approved data with their hospitals. Both parties review the data for any missing or changed records to be submitted to OPHRDC.
- These changes are tracked and checked by OPHRDC before submission to the Ministry for Final Approval. After this Final Approval, the quarterly or annual file is actually locked, and further changes cannot be made without special appeal to the Ministry.

After June 30th, the MTD data is forwarded from the Data branch of the Ministry to the Funding branch of the Ministry, and used for HBAM funding calculations. MTD data which is not used for funding purposes is analyzed for planning and possible future funding purposes.

The details of the above-noted steps are explained in further detail in the next sections.

Submission Cycle from Schools to OPHRDC

As outlined in the following diagram, the current expectation from OPHRDC is that schools will submit their entire file for each quarter (quarterly submission) to OPHRDC 3 times, in order to ensure that all changes are accurately captured in the data submitted to the Ministry.

Schools collect data & assemble
1st Quarterly Submission

| OPHRDC identify **Value & ID** issues | **Value & ID** issue files returned to schools for resolution |

Schools resolve Value & ID issues
2nd Quarterly Submission

| OPHRDC identify **Rotation** issues | **Rotation** issue files returned to schools for resolution |

Schools resolve Rotation issues
3rd Quarterly Submission

| OPHRDC recheck all issues and resolve with schools as needed | Ontario MTD file submitted to MoHTLC for Feedback |

MoHLTC Feedback

| OPHRDC resolve **Feedback** issues with schools as needed | Ontario MTD file submitted to MoHLTC for Initial Approval |

MoHLTC Initial Approval

| OPHRDC send approved file to schools | Schools send approved file to hospitals |

Schools collect any revisions
Final Quarterly Submission

| OPHRDC recheck all issues and resolve with schools as needed | Ontario MTD file submitted to MOHLTC for Final Approval |

MOHLTC Final Approval

There are three broad classes of data in the submitted MTD files: **values**, **identification** and **rotations**. The values data, such as category code, program code or facility code, includes all data for which the Ministry has defined acceptable values or codes. The identification data, such as name, CPSO number or student number, includes all data which confirms the identity of an individual trainee. And the rotation data, such as start date, end date and number of days, includes all data which describes the time spent by that trainee at a particular facility. When processing rotation data, all records are linked by trainee, so that any overlaps can be found in rotations from across the province. This means that the identification of each trainee must be confirmed before rotation data can be processed.

First Quarterly Submission

OPHRDC's first review of each quarter's data clarifies issues related to **values and identification**. The first quarterly submission has been checked and verified by each school individually, but when the records are compiled across the 6 schools, issues especially related to identification of trainees become very evident. It is important to note that this first submission is not checked for any rotation problems, and so schools are encouraged to submit their data on time, even if it is not conflict-free. Schools are able to continue to work on resolving conflicts on their file while the first submission is at OPHRDC.

Values data is compared to the tables of acceptable codes published in the Ministry Submission Standards document.

Identification data is first 'cleaned' to ensure it does not contain unacceptable characters. For P, F and IMG trainees, names and CPSO numbers are compared to the CPSO registry and online database. For U trainees, names are further 'trimmed' so that they can be compared to other names to find potential matches. Multiple queries are run to find names with more than one identifier and identifiers with more than one name, and the results are used to create an undergraduate identification lookup table. Baseline undergraduate identification data from all schools is used to cross-reference identifiers for Ontario students.

Values which do not meet the Ministry Standards are sent back to the schools for correction. Identifiers such as name and student number which appear to refer to the same trainee are also sent back to the schools for clarification. In an effort to streamline the data reconciliation process among schools, OPHRDC uses assumptions outlined in the following Identification Protocols section to suggest changes which would bring consistency to identifiers. All of this values and identification feedback is transmitted to the schools in Excel spreadsheets via the ftp site. In all cases, the school is provided with both original values and OPHRDC's suggestions, so they can verify that any changes are correct.

Schools provide correct values and confirm or over-ride identification changes through a resubmission of their entire quarterly file, in addition to noting any specific identification changes on the feedback spreadsheets.

All changes need to be made in the individual school's quarterly file because the next review will address problems with rotations, and if the records in each school's file are not identified in the same way as the records in the master file at OPHRDC, it will be difficult for the schools to find and resolve the new rotation issues. Resubmitting the entire file reduces the risk of transcription error or of making a change in one file and not the other, as well as allowing schools to easily delete or correct records in their own file as needed and submit additional records which have been received late from their facilities.

Identification changes also need to be noted on the feedback spreadsheets, because otherwise if the questioned data has not changed in the school's resubmitted quarterly data, it's difficult for OPHRDC to know whether the school just didn't see those lines, or whether the school checked and intentionally chose not to make the change. OPHRDC uses the information on the spreadsheets to update their undergraduate identification lookup table, so if there is no feedback spreadsheet to refer to, there is a good chance that OPHRDC will send the same identification questions back to the school after the second review.

OPHRDC's hope is that most of the values and identification questions uncovered in this first review can be resolved within the school, without requiring significant interaction with the other schools. Schools then submit their updated quarterly file and feedback spreadsheet to OPHRDC's ftp site.

Second Quarterly Submission

OPHRDC's second review checks primarily for rotation-related issues. Although there is another check to ensure that previously identified values and identification issues have been resolved, no comparison is made to the first submission to see if records have been deleted or added, or if rotation information has been updated.

Time spent at each facility is to be reflected in the Start Date, End Date and Number of Days columns. Generally speaking the expectation would be that End Date-Start Date + 1 would equal Number of Days (although this is not required, as some trainee time is subject to algorithms based on percentages of full time at specific facilities).

Potential issues include dates which are outside the quarter, and number of days which are greater than the calendar days available for that time period. Records are linked by trainee (CPSO number or student number) to look for duplicate or overlapping records, which may or may not cause the total number of days claimed for that trainee to exceed the number of days available in the quarter.

The rotation questions resulting from these checks (as well as any remaining values or identification issues) are again provided on Excel spreadsheets to individual schools. In this case, schools consult both with their internal trainee rotation/evaluation data as well as with each other to resolve issues.

Starting in Q1 of 2015-16, the following conflict resolution principles were agreed upon and implemented:

- Determination of correct rotation data (where the trainee actually was).
    1. The gold standard is the trainee's verbal or e-mail confirmation
    2. If this is not possible, use the hospital's records or preceptor evaluations
    3. If these are not available, use the school's elective request or master schedule
- Identification of which school should take the initiative and final responsibility to resolve the conflict.
    1. If the home school (School Attended) is involved in the conflict, the onus is on them to contact the trainee to determine where the student actually was.
       The home school then notifies the other school(s) of the trainee's response, and any necessary changes (or appeals) are made.
    2. If the home school is out of province/OOC, or the home school is not involved in the conflict, then:
        - The school with the earliest start date is responsible to contact the trainee or otherwise initiate the conflict resolution.
        - If both/all conflicted rotations start on the same date, then the school with the longest rotation is responsible.
        - If both/all conflicted rotations start AND end on the same date, then the alphabetically first school is responsible.
- Clarification of how changes are made to conflicted records.
    1. It is the responsibility of the Submission School to make any necessary changes to their own records so clear communication and thorough follow through is essential.
    2. Other schools involved in the conflict are welcome/encouraged to note on their spreadsheets any agreed-upon changes, but OPHRDC can only process changes from the Submission School for that record.

OPHRDC will make this as clear as possible by highlighting the school responsible for initiating conflict resolution on the multiple school overlap page of the conflict spreadsheets that are sent to the schools.

As before, a resubmission of the entire file is required from each school in addition to noting any remaining identification changes on the feedback spreadsheets. Starting with the schools' versions of the MTD data with each new review reduces the likelihood of misunderstanding or transpositional errors by OPHRDC, and ensures that all MTD data changes originate with the

Submission Schools. This is another opportunity for schools to delete or correct records as needed, and to submit additional records which have been received late from their facilities.

Third Quarterly Submission

OPHRDC's third and final review before initial submission of the quarterly file to the Ministry checks to ensure that all previous values, identification and rotation issues have been resolved. This is the final time that schools submit their entire quarterly file to OPHRDC, as after this any changes are submitted line by line. Any new or remaining questions are managed by phone or file to affected schools.

OPHRDC creates a record identifier for each line and submits the provincial master file to the Ministry for initial feedback.

Submission Cycle from OPHRDC to Ministry

At the Ministry level, there are 2 different data environments, UAT and Production. In the UAT environment, there is no historical data (it is wiped and there is a clean load each time) and this is where Submission Specification rules are checked. In the Production environment, historical identification data is held in a Students table (student identifiers are flagged if they don't remain consistent from one MTD year to the next). Production data can be loaded one of two ways:

- **Load and Validate** application runs all of the same queries as the UAT environment AS WELL AS finding name inconsistencies. There is a clean load each time.
- **Validate Data and Save to Database** application runs all of the same queries as the Load and Validate application, but also locks the data. After this, any changes require completion of the Delete and/or Change Log fields.

MTD data from OPHRDC is loaded into the above-noted environments by the Ministry in this manner:

Stage	Environment	Result
Initial Submission*	UAT, Load and Validate	Feedback
Initial Approval	Validate Data and Save to Database	Locked Data
Final Submission*	UAT, Load and Validate	Feedback
Final Approval	Validate Data and Save to Database	Locked Data

*These submissions may be repeated as often as needed (ie. to correct problems, to add late records) without requiring (additional) tracking in the Delete and Change Log fields until the Approval date.

Quarterly Ministry Feedback, Initial and Final Approvals

Any issues identified by the Ministry in the UAT or Load and Validate environments are communicated back to OPHRDC for resolution and resubmission. This initial feedback is provided in table format, either via e-mail or upload of an Excel spreadsheet to the secure FTP site.

OPHRDC tracks and creates feedback files for the schools as needed. These are distributed to the schools through the ftp site, and final revisions are requested. The reality is that the quarterly file may be submitted to the Ministry multiple times during this time (second submission will incorporate changes from initial submission feedback, any further submissions will probably be due to the addition of new records or other school-initiated changes). However, each time we submit we hope it will be the final submission.

On the Initial Approval date, the Ministry loads the current quarter's file into the Validate Data and Save to Database Production environment and essentially locks it. OPHRDC distributes the records from this approved database to the schools for the schools to review and distribute to the hospitals for their review. Any changes resulting from this review are forwarded to OPHRDC by the schools via the FTP site based on a Ministry Changes Excel template.

As responses are received, OPHRDC tracks all changes, additions and/or deletions made to the Initial Approval Ministry submission, in the Change Log column (as well as the Delete column if applicable).

When all changes have been received by OPHRDC, a final check is done for new identification or rotation-related issues (as relevant) and the quarterly provincial file is once again submitted to the Ministry for feedback. The same cycle as above will occur until the Final Approval date when the data is fully locked. All schools then receive an exact copy of the records that were submitted on their behalf.

Annual Ministry Submission, Initial and Final Approvals

In June, after the data for all quarters has received final Ministry approval, OPHRDC compiles the records from all quarters into one annual file. Thel records are linked by trainee (CPSO or student number for now) to find the total number of days submitted for each trainee (called ActualDays). When the total number of days for the trainee is less than or equal to the Ministry's annual cap of 275 days (276 days for a leap year), no change is made to the ActualDays column. However, when the total number of days for the trainee is exceeds the Ministry's annual cap, OPHRDC applies a capping formula [(ActualDays/SumofActualDays)*275] to proportionately reduce the number of days for all of that trainee's records and bring them within the Ministry's annual cap.

Unfortunately, while applying the capping formula brings the total number of days for all affected trainees to no more than 275 days, it also results in records where the number of days contains more than 4 decimal places. This is the maximum precision allowed in the Ministry Submission Standards. Removing the additional decimal places with simple rounding results in the total number of days for some trainees ending up greater than 275 days, and other trainees less than 275 days. In order to have the least impact on the total number of days, the individual days are shortened to 4 decimal places in two different ways: bankers rounding [RoundDays] and truncating (or rounding down) [TruncDays].

The number of days to be submitted to the Ministry is then determined according to this algorithm (275 is used here to represent the annual cap):
- when SumActualDays <275 or 275, use ActualDays
- when SumRoundDays <275 or 275, use RoundDays
- when SumRoundDays >275, use TruncDays

Once the formula has been applied, OPHRDC submits the annual provincial file to the Ministry for Initial Approval. All schools receive an exact copy of the records that were submitted on their behalf, as well as a copy of the record including the formula calculations used to arrive at the final number of ActualDays. Schools are directed to review and to forward these initially approved annual files to their hospitals for their review.

Any changes resulting from this review are tracked, checked and submitted back to the Ministry by OPHRDC by the June 30 deadline for Final Approval.

Protocols
As previously stated, "OPHRDC submits to the Ministry only MTD data which has originated from or been verified by the Submission Schools (except for cases which are clearly identified in the later Protocols section)". Those distinct exceptions are:
- student number changes where the name, school attended and category are the same (or very similar)
- legal name standardization for out of province/OOC UG trainees with the same student number, for Ontario U trainees to match the UGME table, or for all P, F or IMG trainees to match the CPSO table
- school attended is automatically corrected to match student number (for U trainees only)
- service code OBST is automatically replaced with OBGY, service code PEDS is automatically replaced with PEDI.
- facility name inconsistencies (spacing, punctuation) where the intended name is evident
- category code inconsistencies where the UGME or PGME tables were able to provide the correct category

As of Q1 in 2015-16, details of the above changes were not included in each school's feedback. There was almost no response to these sorts of corrections last year, and the common comment was that there was usually no way for schools to verify these changes any more than OPHRDC could.

In contrast to 2014-15, if it becomes evident that U students have been incorrectly linked or given incorrect student numbers, OPHRDC will initiate the change request to the Ministry to correct previously submitted data.

Identification

The Ministry requires that all records for the same trainee contain identical identifiers:
- CPSO number for postgraduate (P, F or IMG) trainees or student number (and thus school attended) for undergraduate (U) trainees
- last name, first name
- category code (although single-level category transitions are allowed).

There is currently NO fixed identifier in the MTD data which is common to all trainees with which to confirm their identity. For the 2015-16 MTD year, schools were asked to provide Date of Birth (DOB) and MINC (Medical Identification Number for Canada) for as many records as possible. For the 2016-17 MTD year, OPHRDC will not collect DOB as it will be mandatory for all records (except F) to have a MINC (which will also provide the legal name), and much of the following section may become moot.

For now, since there are multiple instances in which the records for what is apparently the same trainee contain a variation on at least one of the above mentioned identifiers, coming up with identical identifiers can be a challenging requirement.

For P trainees, conflicting CPSO numbers and names can be independently verified using the online CPSO database. For U trainees from Ontario, discrepant identifiers can be independently verified using the School Attended's undergraduate registration data (provided to OPHRDC by each school in early fall).

Verifying identity is a challenge for U trainees who attend a Canadian medical school (outside of Ontario), as there is no easy way to look up these trainees [although the AFMC's Visiting Electives portal may make this easier in the future]. And verifying identity is even more of a challenge for U trainees from out of country (OOC), as there is NO single body which assigns OOC student numbers or tracks their categories, and so no way for independent verification. The issue of independent verification of the identity of UG trainees from a Canadian medical school or from out of country will remain a significant issue until the MINC is mandatory.

Additionally, the student number for Ministry purposes is actually a combination of a 3 letter prefix denoting the school attended, followed by the real-life student number (may be numeric or alphanumeric, depending on the trainee's school and category). This means that there is potential for MTD student number inconsistencies either due to error in identifying the correct real-life student number or error in identifying the correct school attended.

OPHRDC uses multiple queries to uncover identifier discrepancies for what appears to be the same trainee and brings them to the attention of the submission schools, often making suggestions as to which data may need to be changed to bring all the records for an apparent single trainee into conformity, based on various assumptions (outlined later in this document).

The following protocols have been put in place to clearly identify the assumptions and criteria which underlie how OPHRDC suggests changes to identification data (CPSO number, student number/school attended, last name, first name and category code) which schools have submitted.

Identification numbers (MINC, CPSO, StudentNumber)

As per the Ministry Submission Standards, there are actually 3 potential identification numbers: MINC, CPSO number and student number. Because the Ministry is not yet a Licensed User of MINC, no MINCs are submitted to them, although schools are providing them as often as possible. MINC will be mandatory for all but F trainees in 2016-17. CPSO number is mandatory for P trainees (including International Medical Graduate (IMG) and Fellow (F) trainees), since these are the only ones to whom CPSO numbers are assigned. Student number is mandatory for U trainees. CPSO numbers submitted for UG trainees, or student numbers submitted for PG trainees are tracked but not verified or used in the Ministry submission.

MINC

The MINC is an ideal key identifier for all MTD records, as it is assigned to all medical trainees by only one authority with an accessible registry, and once it is assigned, it remains with the trainee for life. This means that MTD days are not double-counted, as a trainee retains the same identifier when transitioning from U to P (or F or IMG). Unfortunately, not all medical trainees in Ontario have been assigned a MINC yet.

Because the MINC is not available for all records in the 2015-16 MTD data, an additional Unique ID field is filled with either CPSO number for P, IMG and F trainees, or student number for U trainees. It is this Unique ID field which is used to link trainee records. For 2016-17, it is anticipated that MINC will be used to link trainee records and this Unique ID field will no longer be needed.

CPSO number and Ontario student numbers

The CPSO number and Ontario student numbers work well as fixed identifiers, because they are assigned by only one authority with an accessible registry. Once a CPSO number is assigned, it remains with the trainee for life.

For the 2015-16 MTD year, OPHRDC is receiving updated CPSO registry files on a quarterly basis for use in validation. OPHRDC received the undergraduate registration files from all Ontario medical schools in early fall.

If the submitted number does not match the name in the registry OR the submitted name does not match the number in the registry, then OPHRDC attempts to find the correct number using either CPSO's online registry or the master undergraduate registration file. If the submitted number is not found in the applicable registry, this is brought to the attention of the school. (In this way OPHRDC was able to identify and delete UG records which were submitted for Physician Assistant rather than medical trainees.)

Assumption

The basic assumption is that the registries are valid, correct and consistent.

Criteria

The criteria which OPHRDC uses to suggest a replacement number are agreement between the registry and the MTD file regarding:

-the same or very similar first AND last name (may match with former name, have additional or fewer names, order of names or exact spelling of names may differ)

AND matching at least 1 of the following:

- level/Category (ie. U3 or CPSO registration class listed as postgraduate education and CPSO graduation year in line with MTD PG category)

- School Attended (ie. CPSO primary practice location in line with MTD school attended)

Suggestion

When a number which meets the above criteria is available, the submission school will be provided with a suggested number. Their choices are to accept the suggestion and use it in their resubmitted file, to provide an alternate number, or to remove that trainee's record(s) if no valid number can be provided.

Non-Ontario student numbers

Student number is a very challenging and variable identifier for out-of-country students especially, because it is assigned multiple times by multiple authorities with no registries (at least none accessible to OPHRDC).

Because of the difficulty in using the student number as a key identifier, OPHRDC created a UG lookup table in 2014-15, to be used as a tool to track and validate UG student numbers and names. Because the Ministry has a perpetual Students table, the UG lookup table is also perpetual, to ensure that numbers and names remain consistent from year to year.

The following protocol outlines how records are added to the UG lookup table.

Assumption

The basic assumption is that the student number must be chosen from the ones provided in the data and that the same student number must be used for the same trainee from quarter to quarter and year to year.

Criteria

Records are considered to be related if they contain the same:
- first/last name combination (or very similar)
- school attended (or combination of records with one Canadian school and OOP/OOC)
- category code (or logical progression)

If no related records are found, or all related records contain the same student number, the new record is considered valid and added to the UG lookup table. If related records contained student number discrepancies, then a common student number was suggested as outlined below.

Suggestion

Suggest the common student number to be used according to this priority:
- use student number which has been previously submitted to the Ministry [overarching requirement - the previously verified number is used without question (and not sent back to the school for re-verification).]
- use student number with Canadian school prefix rather than OOC prefix
- use most frequently used student number
- use lowest/shortest number that is longer than 3 digits

In cases where there is no one 'correct' and valid (3 letters followed by 1-12 alphanumeric characters) student number to suggest, no suggestion is made and records are sent back to all involved schools.

The submission school's choice is to accept the suggested student number (note this on the spreadsheet and use it in their resubmitted file), to keep the original student number, to provide an alternate student number, or to remove that trainee's record(s) if no valid student number can be provided.

The student numbers remaining after the above verification process are added to the UG lookup table.

School Attended

School attended is not fixed since trainees can switch between schools during the year (especially for P, F and IMG). There is currently no easy and consistent way to track whether the school attended code is correct for PG, F and IMG trainees. When MTD data is originally submitted to OPHRDC, the school attended and student number invariably match for U trainees, as the school attended code has been used to create the student number.

However, through the course of the above-noted student number verification process, the student number may have been changed in a school's file without necessarily changing the school attended code. OPHRDC checks for these inadvertent errors just before the initial submission of quarterly data to the Ministry, and automatically uses the 3 letter prefix of the student number to update the school attended field in cases where they do not match.

Legal name

As you know, the Ministry requires that one 'legal name' be used for each trainee throughout the year. The Ministry's legal name is composed of a first name field (which may or may not include a middle name) and a last name field. However, what is considered the trainee's legal name could differ based on what was submitted for the trainee's passport, birth or marriage certificate, CPSO or MINC application, or school registration forms (among other potential options). Similarly, first and last names captured in MTD data are often inconsistent, possibly because trainees introduce themselves differently at a different institutions, and do not necessarily match what might be considered the trainee's legal name. The standard definition of legal name to be used to identify MTD trainees consistently is as follows.

For PG, IMG, F and Ontario U trainees

The legal name for P, F and IMG trainees is the name as registered with CPSO. The legal name for Ontario U trainees is the name as registered with their medical school.

OPHRDC links the numbers in the MTD registry to the numbers in the previously noted CPSO or undergraduate registry and uses the registry first and last names (after logical verification).

[For MTD 2016-17, as long as MINC numbers are available for all trainees, OPHRDC anticipates that the legal name will be set as the name registered with MINC.]

For Non-Ontario U trainees

The legal name for non-Ontario U trainees is the most complete name available at the point that trainee's record was first submitted to the Ministry.

OPHRDC creates a legal name for trainees new to the UG lookup table based on all names provided for a single student number. Where needed, OPHRDC combines names in the following manner to create the most complete name:

- all accents (É, È, Ë, Ô, Ö, Ç), parentheses and periods are removed
- where the only difference is a space or a dash, use most common version
- where it's an obvious typo in comparison to other records, (ie. Mahmoood vs. Mahmood) just correct the mistake
- where one name is a short-form of the other [ie. Lu vs. LucyAnn OR Susan vs. Susan (Susie)], only use the long-form name (remove brackets, do not include both names)
- where there is no similarity in the names, send the records back to the schools to confirm the student numbers (no changes made)

Once a name has been submitted to the Ministry, any new names submitted for a trainee already in the UG lookup table will be changed to the pre-existing legal name (even if the name has legally changed, as in the case of marriage). If the identity of the trainee is in dispute, the submission school always retains the right to resubmit the record with an alternate student number.

[For MTD 2016-17, as long as MINC numbers are available for all trainees, OPHRDC anticipates that the legal name will be set as the name registered with MINC.]

Category

Category is the name used in the Ministry Submission Standards for what is more commonly known as level, and includes F (fellow), IMG (international medical graduate), U1-U6 as UG (undergraduate) options and P1-P8 as PG (postgraduate) options. Category has not previously been tracked carefully by facilities, and so discrepancies in the MTD data are the norm. The correct category for a trainee also changes at least once during each MTD year, usually on July 1 for PG (F) trainees and on September 1 for UG trainees. But there are many exceptions to that rule, and IMG trainees can transition at any time. The general expectation is that a UG or PG (F) trainee will not be in more than 2 categories per MTD year, and that for UG trainees the categories must be consecutive. IMG trainees can legitimately be in 3 or 4 categories per MTD year.

OPHRDC automatically assigns category codes in cases of category jumps, according to the following criteria:

- If the category jump occurs with a PG or an Ontario UG trainee, then the category or categories (based on rotation start/end dates) recorded in the UG or PG registries will be used by OPHRDC to overwrite incorrect category codes.
- If the category jump occurs with a Canadian or OOC UG trainee (or a trainee not in the UG or PG registries), all records for the affected trainee will be sent to all involved Submission Schools, in order for them to confer and determine the correct category or categories.

In 2014-15, Submission Schools agreed not to be notified of changed categories on a record by record basis. They see the corrected category when they receive their copy of the file that was sent to the Ministry.

Facility and Site

There are numerous cases where the Facility Names in the MTD Submission Specification table contain unusual spacing or punctuation, but the schools submit the Facility Name with more usual spacing or punctuation. OPHRDC automatically corrects these facility name inconsistencies (spacing, punctuation) where the intended name was evident.

In recent years, there have been many cases where multiple hospital sites have been amalgamated into one facility. Following the final submission of MTD 2014-15, it became evident that there were certain instances in which MTD records needed to be tracked at the facility site level (as well as at the facility level).

The option to use the Ministry's Master Number for this purpose was explored and found to be an impractical solution for MTD, since the master number is based on bed type and MTD data from all sources is based on care type. The option to use an OPHRDC-created facility site name/code for all MTD records was not practical for all schools as it was more work than value to change their pre-existing lookup tables.

As a compromise position, schools submit site name/code where appropriate. In these cases, OPHRDC automatically submits the Ministry-approved Facility Code/Name in place of the site name/code (while retaining the site information).

Service Code

There were 2 cases where Service Codes in the 2015-16 MTD Submission Specification were updated without schools' full awareness. OPHRDC has brought this to the attention of schools, and expects that they will have their lookup tables updated by 2016-176. However, for the remainder of 2015-16, OPHRDC automatically replaces OBST with OBGY and PEDS with PEDI.

Appendix F: MOHLTC MTD Submission Specifications

Version 10.2, finalized August 11, 2015

Prepared by MOHLTC. Unedited by Author of this MTD Protocol Report.

See attached file.

Appendix G: Presentations to MTD Debrief Day

June 11, 2015

Prepared by various presenters. Unedited by Author of this MTD Protocol Report.

Folder will be provided for posting on OPHRDC website.

Appendix H: Medical Schools' Data Management Processes

August to September, 2015

Interviews with representatives from each of the six Ontario medical schools. Compiled by Cynthia Mech and Kathleen Clements.

File will be provided for posting on OPHRDC website.