

Companion to The MLT Human Resource Crisis Report

Presentation to the MLPAO

updated July 23 2019

resubmitted October 18 2019, as v-3

Prepared by AiCon Inc., Kris Bailey CSMLS Medical Technologist, BA, MBA, PMP, ICD.D
Principal Consultant
kris.a.bailey1@gmail.com

Methodology

- Talk since the 1990's – SHORTAGE of MLTs
- Scores of conferences – SHORTAGE OF MLTs
- MLPAO Think-Tank – 60 administrators and educators – SHORTAGE of MLTs
- MLPAO hired Kris Bailey to determine strategies related to the MLT Human Resource Shortage
 - Research domestic, USA, UK, Australia, New Zealand
 - Telephone interviews with key stakeholders (labs, educators, government)
 - In person interviews
 - Report and Slide Deck
- Report was tabled July 23 2019; the CSMLS, CMLTO and Accreditation Canada were later interviewed; resubmitted October 18 2019

Hypothesis

- Is there a Health Human Resource Crisis?

This was not a research paper but was based on interviews with laboratory operators, educators, MOHLTC, CSMLS, CMLTO, Accreditation Canada and associated research to determine if the MLT shortage is real or will it be real and what can be done to alleviate the pain and strengthen the profession.

Objective

- Improve the supply of laboratory professionals;
- Build capacity in the systems;
- Strengthen and modernise education and training pathways;
- Promote faster learning;
- Provide the requirements to work and to advance through a career ladder / pathway based on interest and need; and
- Advance persons with academic degrees and foreign trained into the areas of interest.

Recommendations

To create sustainable, exciting and resilient professionals, it is time to generate meaningful change.

1. Invest in an integrated career framework.
2. Restructure, redesign and/or adapt the content, the competencies and the syllabus.
3. Add more academic seats AND increase retention rates.
4. Redesign the Clinical Placements.
5. Promote Medical Lab Science as a career option to high school and university students and create a recruitment strategy.
6. Each employer-based organization should develop an HHR-MLT plan.

Challenges & Factors

- 3-R's: recruitment, retention, retirement
- Factors impacting the clinical lab workforce, where demand exceeds the supply:
 - Retirement of an aging workforce;
 - Unfilled high vacancy rates (particularly specialists, senior staff, leadership);
 - An increase in demand for laboratory services;
 - Changes in the practice of clinical laboratory science due to technology;
 - Regionalization, amalgamation, down-sizing and closures; and
 - Major advances in medical diagnostics and treatments.

Is there an MLT HHR Crisis?

- The numbers from Ontario and Canadian government determine that the employment outlook will be good and in balance over the next 10 years.
- In contrast, the US Department of Health and Human Services projects a substantial increase in demand / growth for medical and clinical lab staff between 2012-2015.
- In context
 - *Decreasing need for MLT* is due to consolidation, regionalization, rural / urban divide, laboratory automation, middleware, integrated information system, technological innovation
 - *Increasing need for MLT* is due to test volume increases (aging demographics, chronic disease and population risk profiles), innovations in clinical science and technologies, increasing complexity of science, new lab testing markets (non-profit community based clinics and the expansion of home and community care using mobile diagnostics) and staff vacancies - particularly in technical leadership
 - **Will there be an MLT shortage? YES**, if the contexts and the HHR-MLT are not managed with purpose. The recommendations will lessen the impact of the shortage and strengthen the profession.

Questions arose

Due to many factors, the MLT supply diminishes as the demand for lab testing increases.

- Is the answer as simple as increasing the number of academic seats?
- Should an entry level shortened diploma program and a BSc program exist?
- Should academic / practicum upgrade routes exist, with a Career Ladder?
- Should Histology be removed from the MLT-Gen program?
- Do the competencies /curriculum serve the laboratory, technology, market and demand?
- Does a geographic or positional MLT gap need attention?
- Do educators / organizations create CP reciprocity / virtual networks?
- Testing is moving to a data business!! Change in a way we view our profession is needed.

The Players in the Change Agenda

- Ontario
 - a. Regulatory Body – CMLTO
 - b. The Educators – UHN / Michener, UoIT, colleges
 - c. Licensing – MOHLTC
 - d. Lab organizations – hospitals, community, OPHL
 - e. Professional organizations – MLPAO, OAP
 - f. The Payors – MOH, MTCU
- Canada
 - g. Competency Creator – CSMLS
 - h. Professional organizations – CSMLS, CMA
- Accreditor
 - Education Accreditor – Accreditation Canada
 - Quality Accreditor – IQMH (Ontario)

*Some are supporters;
Some are enablers; and
Some are **key players**.*

*Accreditors are not considered
primary stakeholders in the
change agenda.*

What, Who and When

SHORTER TERM – ONTARIO CONTROL

4. Redesign the Clinical Placements (inclusive of small, rural / northern hospitals). **b, d, (f)**
3. Add more academic seats AND increase retention rates. **b, f, e**
5. Promote Medical Lab Science as a career option with a recruitment strategy. **b, d, e**
6. Develop an HHR-MLT plan. **d**

LONGER TERM – NATIONAL CONTROL

2. Restructure and redesign the content, the competencies and the syllabus to mirror the career framework. **g, a, b** (competencies in collaboration with Accreditation Canada)

2. Restructure, redesign and/or adapt the content, the competencies and the syllabus. **b + d, e (c)**

LONGER TERM – ONTARIO / NATIONAL AGREEMENT

1. Invest in an integrated career framework. **a, b, e, f, c**

**Change Leadership
is Required!**

Appetite for Change

Change Leadership is Required!

Higher Appetite

- Educators:
Universities
Institutes
- Hospital Lab Employers
- New Market Employers
- MLPAO
- CSMLS – **Call To Action**



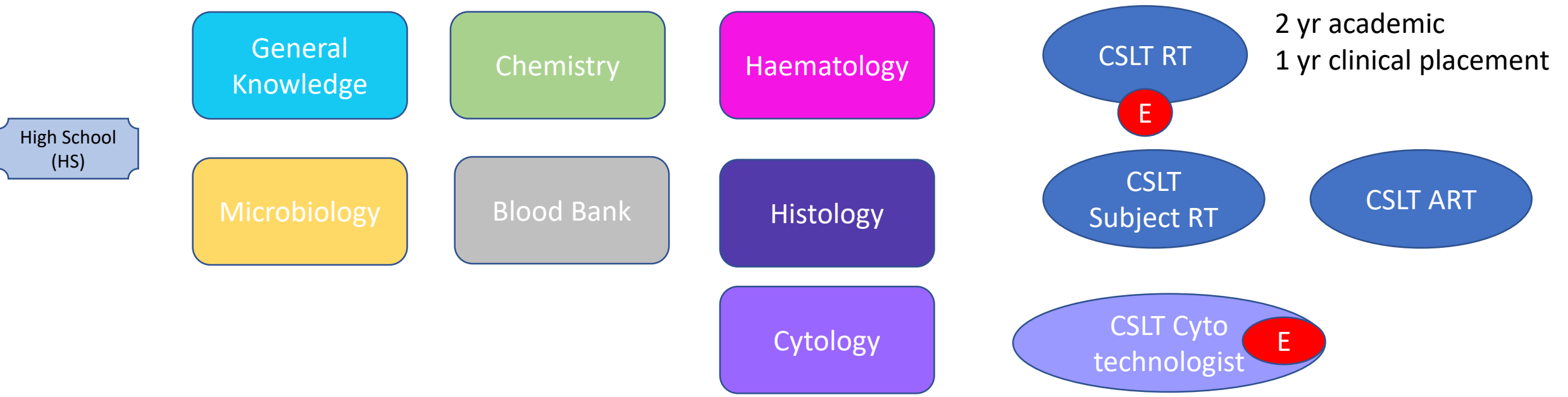
- Educators: institutes,
colleges, universities,
private colleges
- Community Lab Employers
- CSMLS – national focus
- CMLTO

MOHLTC MTCU OAP, OMA, CMA IQMH, Accreditation Canada

The Transformational Rate will Escalate.

The Career Progression, from the 1970's to now

The 70's - Ontario



Intake is high school (grade 13 graduates).

Academic was “schools of medical technology” and TMIT (later called the Michener Institute).

Lab organizations taught technicians.

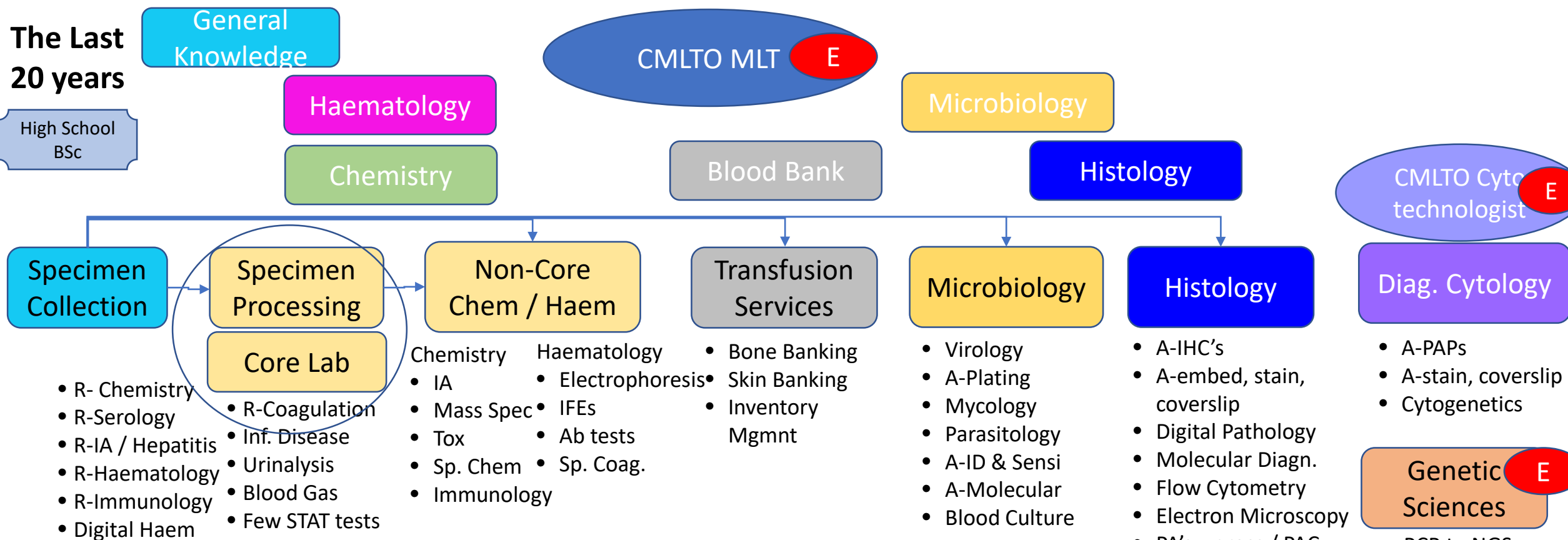
RTs (now MLTs) performed specimen collection, processing and testing. Some night shift, mostly call back.

MANUAL EVERYTHING; early adopter LIS; early adopter automated instruments.

No public register, no college (CMLTO), only professional associations (CSMLS, OSMT).

The Last 20 years

High School BSc



- Intake is high school (grade 12 graduates, BSc, IEMLTs).
- Academic is “colleges, institutes and universities”.
- *Core lab automation* – Preanalytical (centrifuge, aliquot, sort, decapping), routing, pick n’place robots, middleware (auto-QC, result auto-validation & test algorithms, on-line instrument maintenance); Analytical automation, materials handling automation (storage) offered by TLA or workcells
- *Non Core Automation* - Bacti Automation (advanced bacti-plating, WASP, MalDI-ToF); Histology Automation (introduction of embed, stain, coverslip); Transfusion Automation (antibody ID)
- *LOT’S OF NEW TESTS* (cancer, cardiac, allergy, endocrinology, immunohistochemistries, bone / skin banking, genetics – genes and modality panels)
- *LOT’S of new tests & testing technologies* (automated IHCs, IA/Hepatitis, PCR to NGS; Molecular, LDTs, Mobile DX)
- Many technologies and tests were mothballed (RIA, flame photometry, spectrophotometers, auto-analyzers, single test analyzers, media-making)
- Networked LIS & “best of breeds” (Cellavision, transfusion services, GUI bacteriology, pathology (cyto / histo); PAC and digital pathology; OLIS; inventory mgmnt, CPOE (as a result of interfacing LIS to HIS with Care Maps); Bioinformatics (gene selection, big data)
- Quality accreditation (OLA - 2000) to QMP-LS – OLA to IQMH, CSTM, CSA, CBS, ORBCON, NYS, document control, accreditation & proficiency testing

Compare And Contrast

The last 40 years In Lab Medicine

	70's and on	To the last 20 years
Intake	Grade 13 high school (HS)	Grade 12, BSc, IEMLS, MSc
Schools	Medical Technology & TIMT	The Michener, Universities, Colleges
Graduates	General RT, Cytotechnologist	General MLT, Cytotechnologist, Genetics Science
Exams	Subject / Discipline based	Competency based
Extra	Subject RT, ART, CSMLS courses	CSMLS courses, OHA, university
IM	Paper requisitions (MD orders), LIS	Best of Breed – LIS (TM, pathology, genetics); Integrated HIS & LIS, CPOE orders multi-site networks; OLIS
IM - Imaging	Nothing; Paper histograms	Cellavision; PAC; Digital Pathology
IM - Tools	Nothing	Middleware (sorting, routing, instrument maintenance, storage, result auto-validation, rules-based algorithms, re-routing (reflexive testing; repeat), auto-QC, GUI); 360 patient armbands (pos. pt. ID) Bioinformatics (genetics)
Testing	Manual, semi-automated batching	Automated multi-discipline, random access in real-time
Automation	Nothing	Integrated automation: multi-discipline TLA (pre-analytical, robots, conveyors, haem, coag, urine, chem, IA); workcell automation (Haem, all purple top tubes)
Lab op's	By Discipline Routine & STATs	Organized by technology and diagnostic work (e.g. Core Lab, non-Core, TM, Bacti) Eliminating STAT's due to process, speed, automation Eliminating aliquots (automation, middleware) Reducing footprint (multi-test analyzers)
TAT	By test	Core Lab - <45minutes (100% of the time)
Time	Day, evening, call back	24x7
POCT	Urine dipstix	Molecular DX, non-invasive DX
Cost	Not calculated	Core KLab (80+% tests): \$2.50 Pathology cases: \$100-150
Staff	All RT; subject RT's; few technicians; few nurses (collections)	Multi-discipline OR streamed MLT's & MLA/T's – all in work teams
Utilization	Not measured	Over utilization reported @21% Under utilization reported @45% Care Maps coupled with CPOE
OP collections	Started Private Labs SCC's, hospital SCC's	Hospitals: IP, Reg. OP, OP - unpaid Private Labs: Ops
Quality	Technical	Accreditation, Process, LEAN, QMS (QC, QI, QA, critical incident reporting, RISK mgmnt)
Labs as a cost centre	Viewed as a Cost Centre	Can save hospital \$; enables ALOS to be optimized; enables bed flow from ED to admission

Where are we now?

- Bench, technical leadership MLTs are retiring; MLA/T supply is good
- The operating labs are much more automated
 - “Processing” work and “Thinking” work due to automation of tasks, testing and information
 - Automation – TLA and workcell automation in Core Lab; Histology, & Genetics automation continues to be refined
 - Histology and Genetics are changing to look more like core labs where MLA/T’s perform the operating tasks and MLTs supervise, troubleshoot, interpret and screen slides / images
 - Automation – information management continues to evolve, grow and become more complex (bioinformatics)
 - Evolving infectious disease and antibiotic testing; more complex transfusion services
 - Information management : *Networked LIS & tools*: Cellavision, middleware; “Best of Breeds”: transfusion services, GUI bacteriology, pathology (cyto / histo, PAC and digital pathology); OLIS; inventory mgmnt, CPOE (as a result of interfacing LIS to HIS with Care Maps); Bioinformatics (gene selection, big data)

Where are we now?

- Extending Lab into non-traditional areas using Mobile DX
 - Who will manage this, assure quality, integrate information and pay for it?
- Hospital organizations continue to regionalize and amalgamate (e.g. EORLA, St. Michaels – St. Josephs); Community Labs are bigger and fewer in number
- Educators work mostly in isolation – recruitment, curriculum
- Continuous provincial budget cuts even though labs save the healthcare system money if utilization is managed and Infectious Disease testing can determine isolation requirements.
- Administrative leadership and decision making is migrating to non-laboratory personnel
- REAL lack of value-based understanding of the contribution of laboratory medicine to decision makers (hospital leadership, OHA, politicians) and coveting of the “past”.

What do we do?

- **The “New Grad MLT” Struggle**

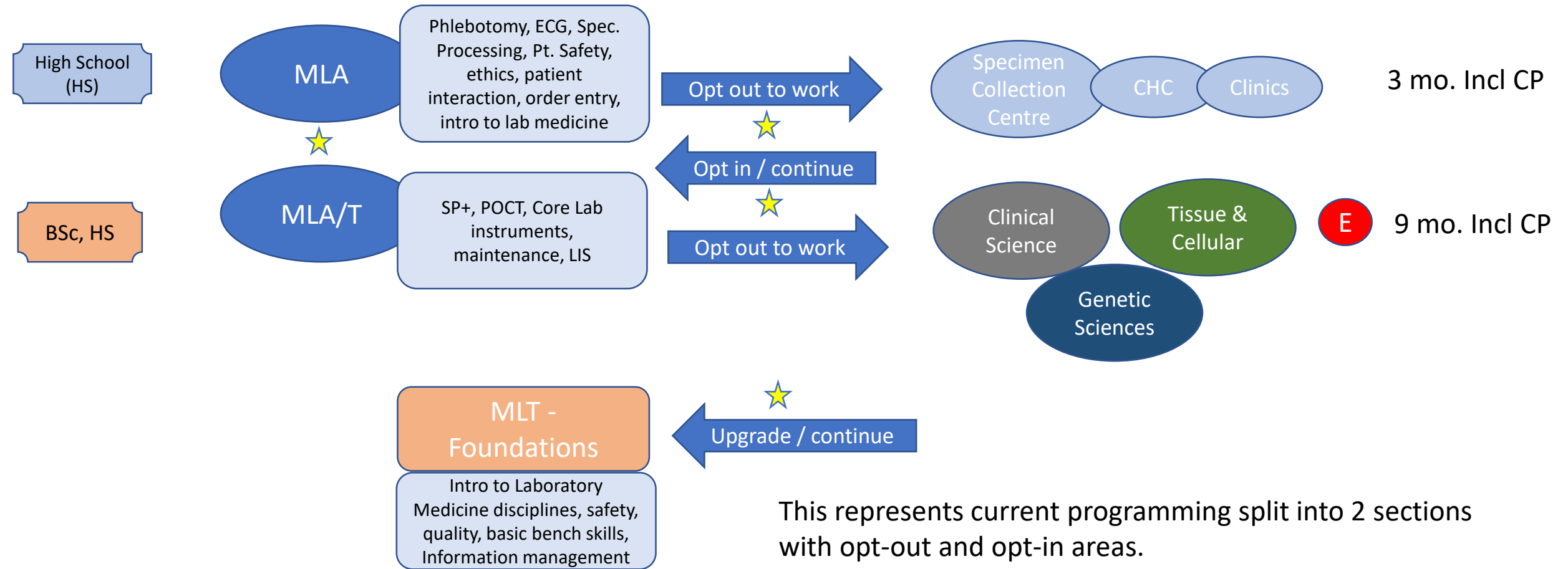
- MLT training seems “bipolar”. The UHN / Michener intake is BSc, essentially creating graduates that are BSc-MLT. The colleges intake is high-school and the graduates are MLT. The students are not created equal but do share an MLT diploma, spend the same amount of time in school with a start pay grade that is the same. Cytology and Genetics graduates are “specialist” MLTs. There is no Subject RT or new ART.
- The Profession examinations have changed marginally in 50 years but the operating domains (the way we work!) has changed.
- Content of the Programs academic courses lags the realities of work.
- Discrepancies exist between Small Hospital – Rural MLT (more general, with patient / clinical staff interactions) and Large Hospital / Urban needs (early streaming, with little to no patient / clinical staff interactions)).
- MLT shortage – is it real? If so, what do we need?
 - . *Urban MLT, Rural general MLT, specialist MLT, technical leadership, functional leadership, administrative leadership???*

- Evolving roles for MLT: newer “lab locations” are being introduced –clinics, MD offices and perhaps pharmacies, home use Mobile DX; research; diagnostic companies needing sales and product specialists; home care companies.

The Career Framework (Ladder)

MLA, MLA/T, MLT, MLT Specialist, Post Grad

Diagram 1: MLA – Career Ladder



This represents current programming split into 2 sections with opt-out and opt-in areas.

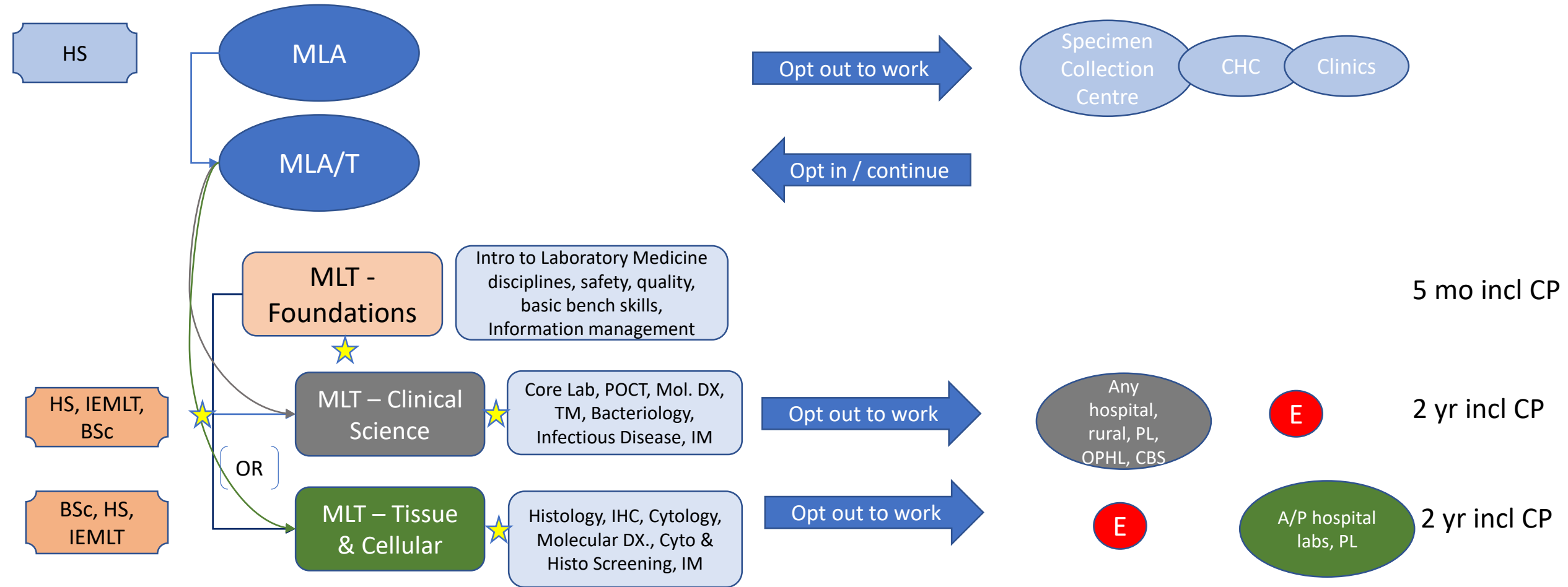
MLA and MLA/T are not regulated.

MLA/T are certified as a result of successful MLPAO E competency exam.

MLA/T are registered with the professional association and listed on a public register.

Legend: ECG – electrocardiogram; CHC – community health centre; CP – clinical placement; SP+ is advanced specimen processing, POCT – point of care testing; LIS – laboratory information system
Change is noted with a yellow star

Diagram 2: **MLT – Career Ladder**

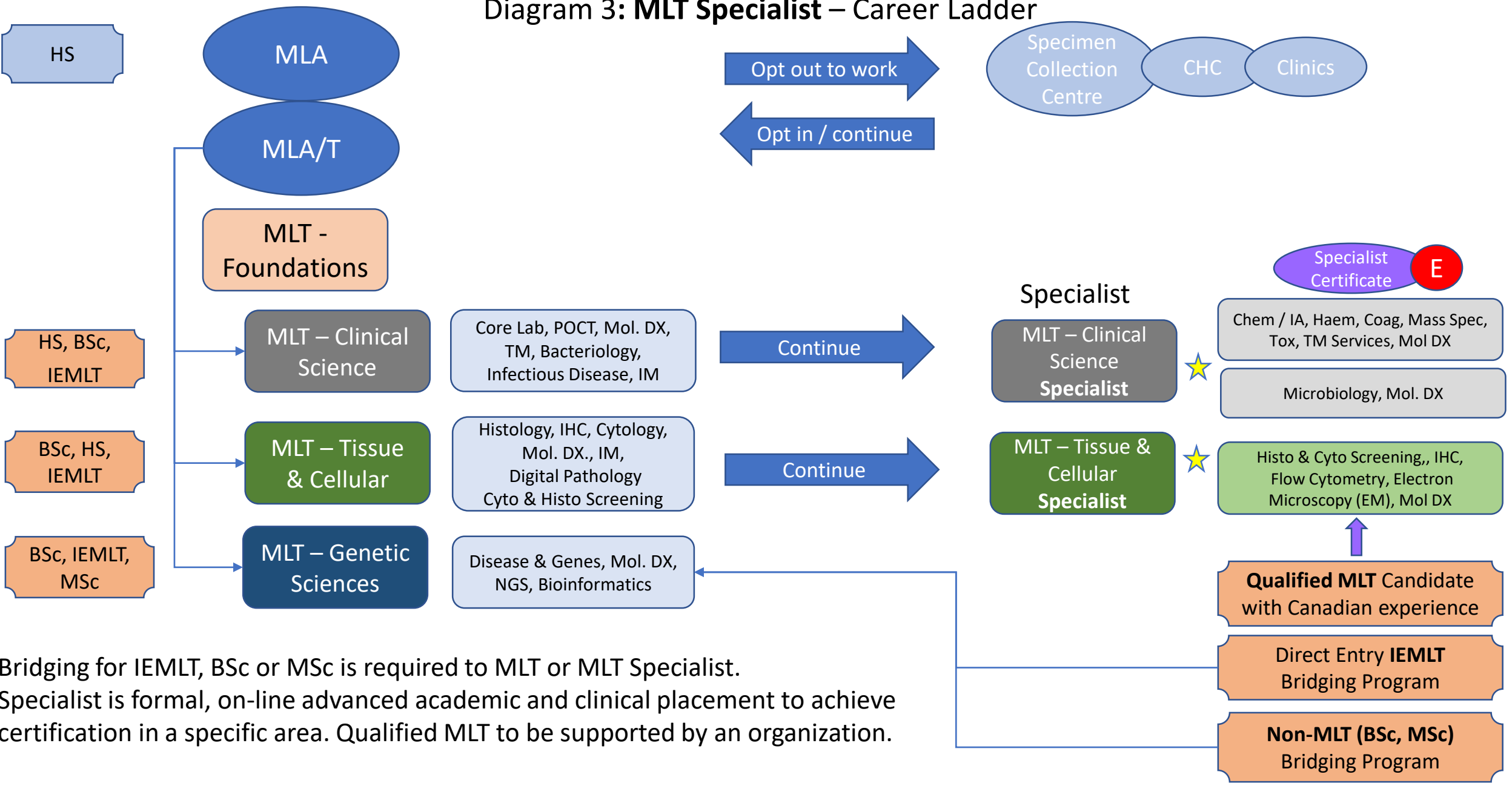


MLT streams from the Foundations Program to Clinical Science or Tissue / Cellular. The current General MLT includes Histology which transitions with the Diagnostic Cytology to Tissue / Cellular. The MLT- Clinical Science drops Histology. Diploma MLT are regulated, certified as a result of successful CSMLS exams, registered with CMLTO, on the public register.

E

Legend: Mol DX – molecular diagnostics, TM – transfusion medicine, IM - Information Management incl middleware and artificial intelligence, PL – private labs, OPHL – Ontario Public Health Labs, CBS – Canadian Blood Services, IHC – immunohistochemistry, Diag – diagnostics, Cyto – cytology, Histo – histology, A/P - anatomic pathology

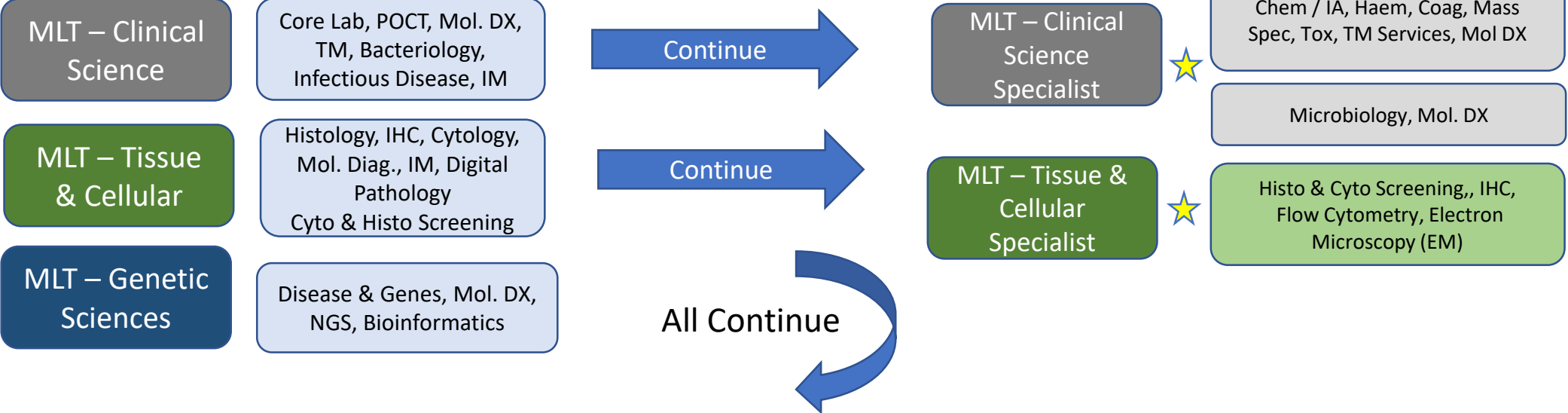
Diagram 3: MLT Specialist – Career Ladder



Bridging for IEMLT, BSc or MSc is required to MLT or MLT Specialist.
 Specialist is formal, on-line advanced academic and clinical placement to achieve certification in a specific area. Qualified MLT to be supported by an organization.

Legend: Chem – Chemistry, IA – immunoassay, Tox – toxicology, Haem – haematology, Coag – coagulation, TM – transfusion services, Mol Diagn (DX) – molecular diagnostics,

Diagram 4: Post Grad – Career Ladder



MLT

Technical Leaders:
 Charge Technologist
 Technical Supervisor
 Operations Manager
 LIS Coordinator

Achieve... **Degrees (STEAM) or Health Science, Diplomas, Specialist Certificates**

MLT or non-MLT

Functional Specialties:
 QMS, OH&S, Risk Mgmt, IM, Bioinformatics
 Functional Supervisor (not technical)

Achieve... **Degrees (STEM) and Informatics, Functional Certificates or Diplomas**

MLT or non-MLT

Administrative Leadership
 Administrative Director
 Administrative Functional Leaders (H-R, Finance)
 VP Diagnostics, Hospital Executive

Achieve... **Degrees (MBA, EMBA, MHS), Certificates, Bus. Diplomas**

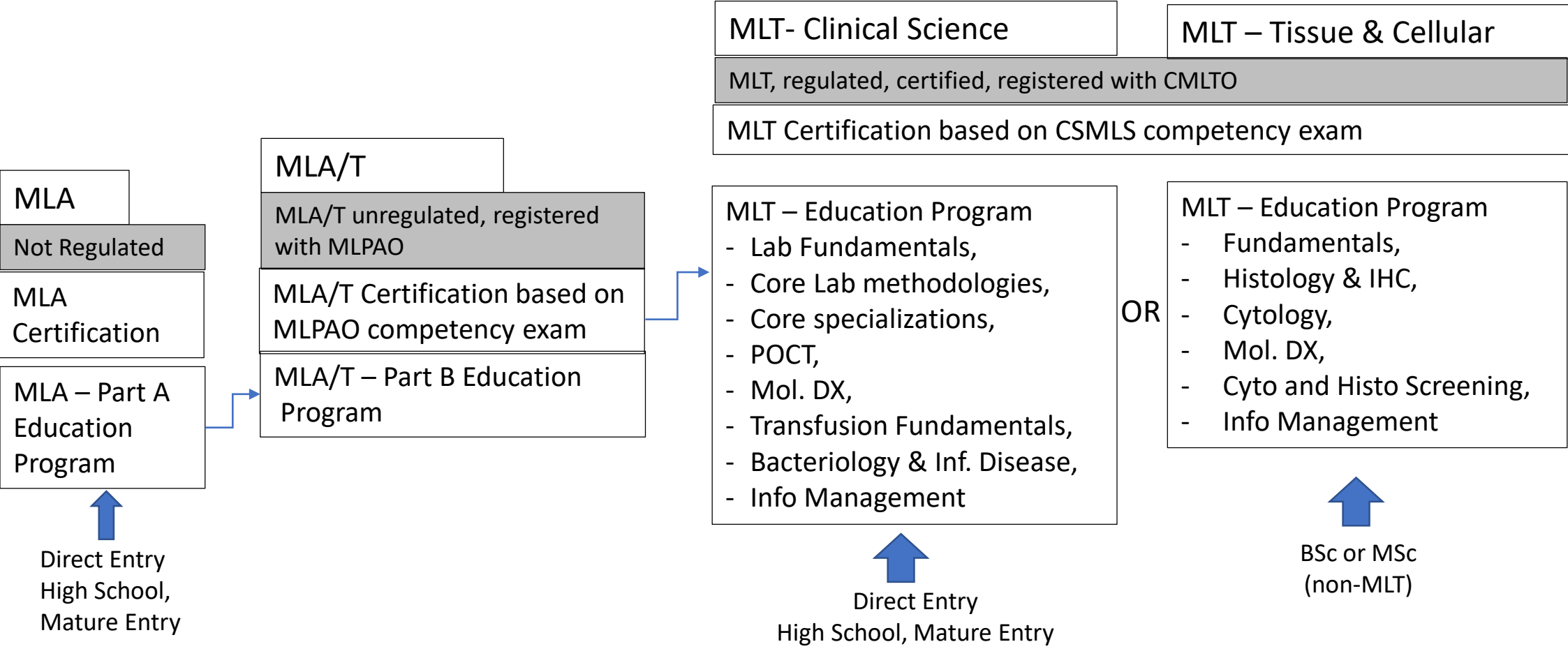
University graduate

Clinical Degrees
 MLT goes on to BSc
 BSc-MLT goes on to MSc or PHd, Pre-Med, Health Sciences, Health Law

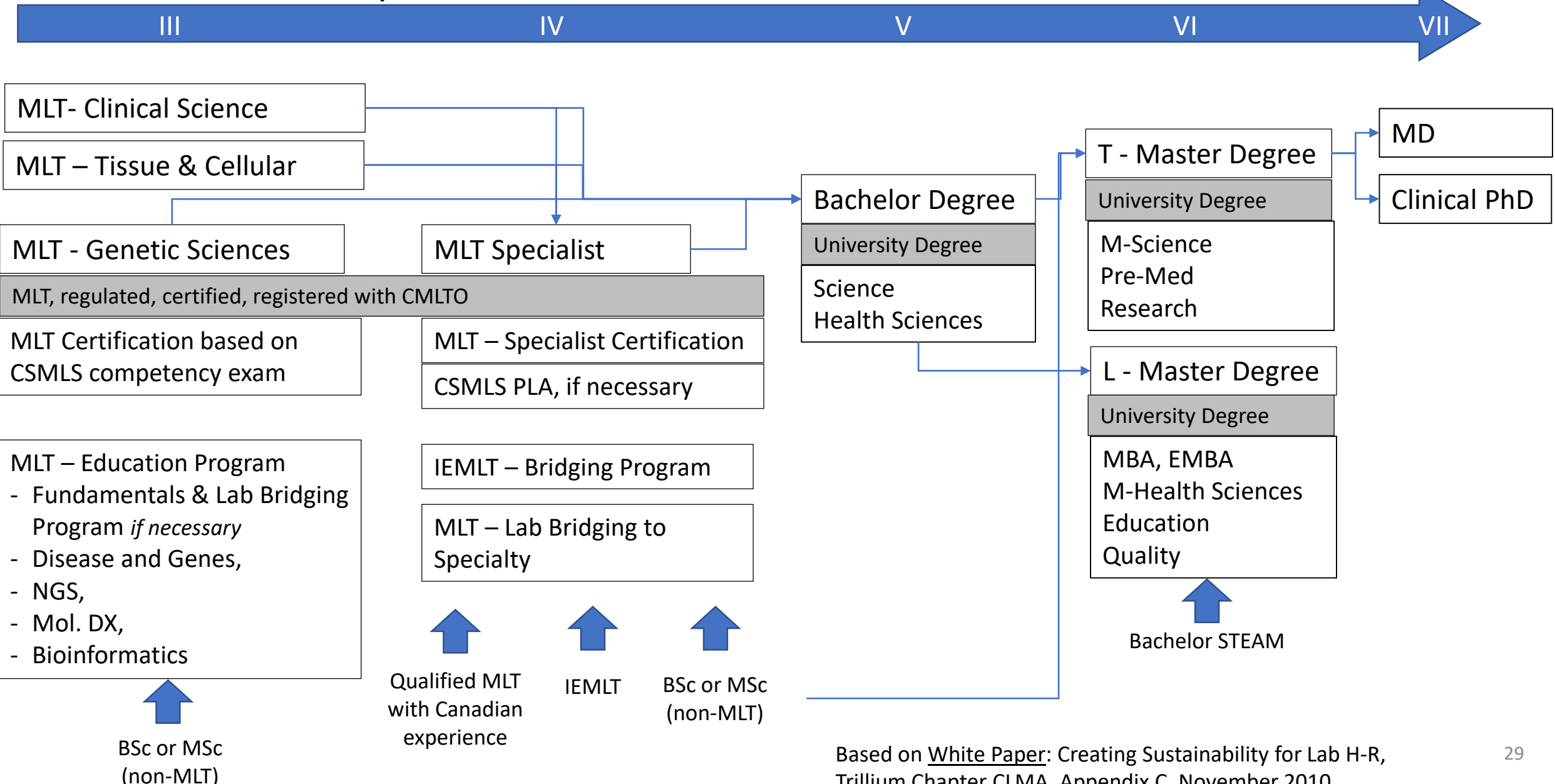
Achieve... **Degrees (BSc, BHS, MSc, PHD, MD)**

The Proposed Education / Career Path Model

Proposed Education / Career Path Model



Proposed Education / Career Path Model



Implications

- Career Ladder may require salary adjustments
- Rural / northern areas (students) may require CP funding and isolation pay
- Questions need to be answered
 - Is the answer as simple as increasing the number of academic seats?
 - Should an entry level shortened diploma program and a BSc program exist?
 - Should academic / practicum upgrade routes exist, with a Career Ladder?
 - Should Histology be removed from the MLT-Gen program?
 - Do the competencies /curriculum serve the laboratory, technology, market and demand?
 - Does a geographic or positional MLT gap need attention?
 - Do educators / organizations create CP reciprocity / virtual networks?
 - Testing is moving to a data business!! Change in a way we view our profession is needed.

Change Leadership is Required!



The Transformational Rate will Escalate.