

Exploring the learning experiences of first year pathology residents through the lens of realist inquiry

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"Protected [learning] time allows you to read in depth and really **solidify** any kind of concepts that you're exposed to that day or that week... [without it], I personally would feel that I am bombarded with too many entities, and not even just feeling **overwhelmed**, [but] not really feeling as though I'm learning anything... [it's like] **going through the motions** without really, truly understanding what you're seeing, what the process is, and what the implication is for the patient." - transcript G, lines 98-100

In early training, a lack of graduated learning and graduated responsibility contributes to feelings of overwhelm and frustration, which in turn leads to disengagement and being prone to developing knowledge gaps.

"Throwing you in water to see if you can swim... there was **no shallow end**... I would just spend hours pouring...not get anywhere, spinning my wheels, getting so **frustrated** and **disengaged**" - transcript D, lines 104, 107 and 294

In early training, a lack of direct supervision when performing novel skills (ex: grossing) causes inefficiency in obtaining competence and promotes scenarios that are prone to medical error.

"[It] was not necessarily that the expectation was for me to be competent in it, but the expectation was for me to **just do it, even if I was incompetent**, which did not feel safe... I was just told to look at standard operating procedures and just go in and do it. It wasn't until I had been grossing a couple of **months** that I started to notice common themes." - transcript D, lines 85 and 122

"We had a lecture and then **direct supervision** for grossing... having that we sort of **hit the ground** running when it came to [complex] grossing in ways that [other] cohorts did not." - transcript F, lines 125 and 248

In early training, lack of peer support, particularly of senior residents, contributes to a negative learner experience and the creation of knowledge gaps, through feelings of intimidation and a sense of unapproachability to ask for help.

"I've asked questions to seniors and they've been like, 'sorry I'm busy...' if a junior works up the **courage** to go disrupt you and ask you a question, **do better** than giving them that as an answer." - transcript A, line 484

TAKE HOME POINTS

- 1 The minimal pathology-specific exposure in medical school leaves residents feeling woefully underprepared for pathology residency, at no fault of the individual or residency program
- 2 In order to solve this problem, pathology residency training programs must have an onboarding process for new residents to mitigate the steep learning curve
- 3 A combination of **semi-structured protected learning time** and **graduated workplace-based** training are key modalities in mitigating this problem
- 4 Direct supervision for novel-tasks enables efficiency in the learning process and decreases scenarios that are prone to medical error
- 5 Interactions with senior residents have a significant impact on the learning experiences of early trainees

LIMITATIONS

- Conducted at a single academic center in Canada with a relatively small sample size
- Relationship between the interviewer (senior DaMP resident) with interviewees (co-residents) may have influenced responses

FUTURE DIRECTIONS

- On-going analysis will be conducted until theoretical saturation has been achieved
- Refine the curriculum module to further incorporate time for structured independent study, and graduated work-place based training
- Work with DaMP and DCP program leadership to further incorporate our findings into early residency training (such as during Introduction to Discipline)

REFERENCES

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BACKGROUND

- There is a recurring and challenging knowledge gap transitioning residents experience in Diagnostic and Molecular Pathology (DaMP) and Diagnostic Clinical Pathology (DCP)
- There has been a trend to reduce pathology-specific requirements in Canadian medical schools, such that there are currently no histology/histopathology-specific objectives outlined by the Medical Council of Canada¹ and there are no pathology-specific clerkship requirements
- Laboratory disciplines have traditionally adopted the same residency approach as clinical disciplines (apprenticeship), despite differing contexts (i.e. limited medical school exposure)
- A novel curriculum module was introduced into DaMP and DCP Foundations of Discipline (FoD) during the 2022-2023 academic year to try and bridge this knowledge gap
- While the efficacy of this model was supported by casual observations and resident feedback, the unique challenges faced by early pathology trainees were still unclear
- Further, there is a dearth of medical education literature that explores evidence-based approaches to pathology training, despite its distinctness from clinical specialties²

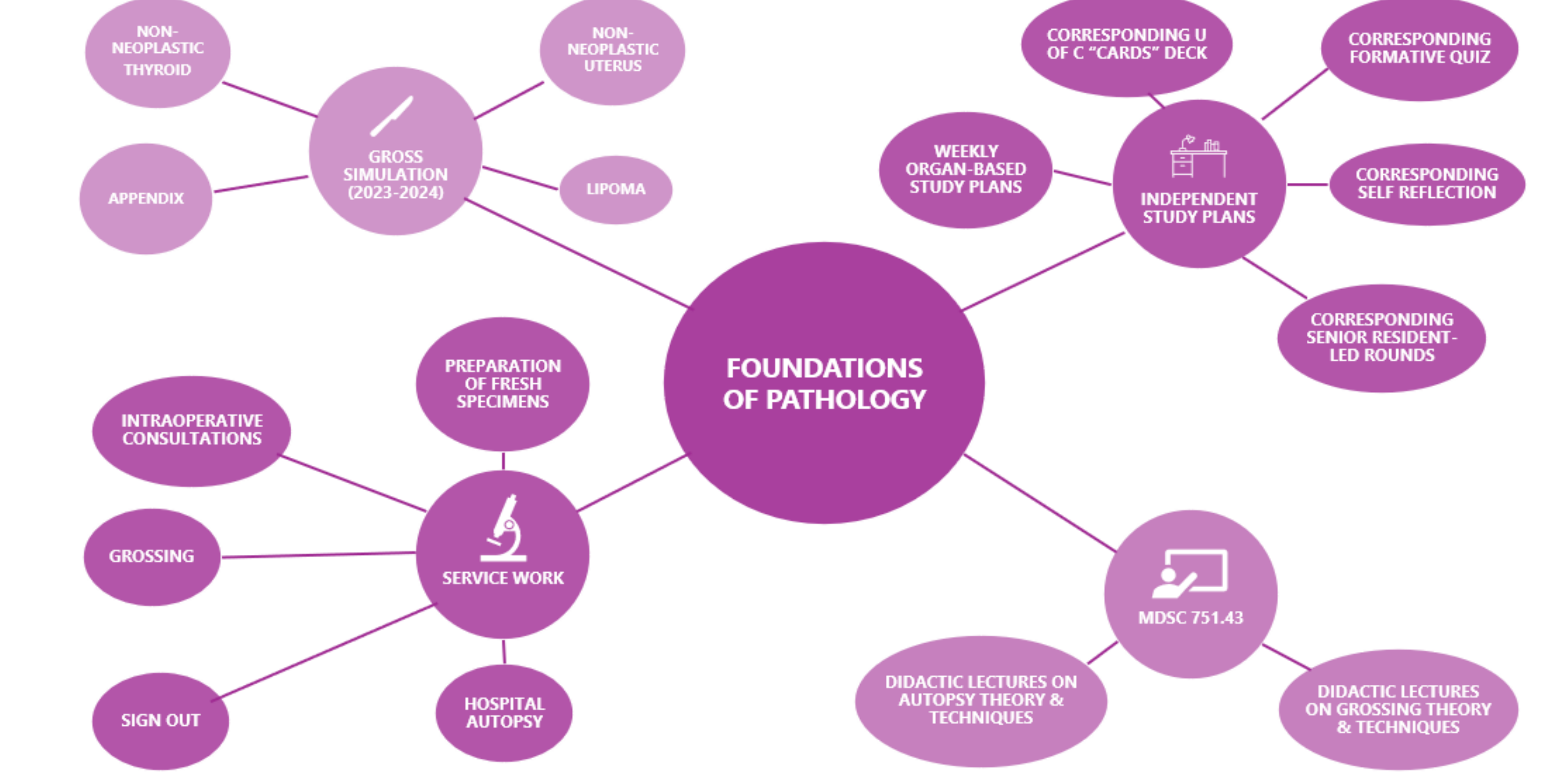


Figure 1: Mind-map of the components of the novel-curriculum module introduced during DaMP and DCP FoD; a combination of **semi-structured protected learning time** and **graduated workplace-based training**.

RESEARCH QUESTIONS

- 1 What are the perceived learned challenges faced by early pathology residency trainees?
- 2 What are the components of effective learning in early pathology residency training?

METHODS

STUDY DESIGN

- Qualitative research design using Pawson's Model of Realist Inquiry
 - "What works for whom, under what circumstances, how and why?"^{3,4}
- Conducted between January 2024-April 2024 at a single Canadian academic institution
- All DaMP and DCP residents who had completed FoD were invited to participate

DATA COLLECTION



Figure 2: Flow chart of approach to data collection.

DATA ANALYSIS



Figure 3: Flow chart of approach to data analysis. KF conducted open coding on free-text entries in the survey and de-identified interview transcripts. KF, RE and AB contributed to data-homogenization, recognition of demi-regularities and formation of subsequent middle-range theories.

RESULTS

- Survey: 14/23 respondents = 61%
- Follow up semi-structured interviews: 8/14 = 57% ; 50:50 pre/post novel curriculum module
- Over **20 middle range theories** were identified, most showing **counter-factual** phenomena

HIGHLIGHTS OF MIDDLE RANGE THEORIES

Early pathology trainees face unique learning challenges related to the lack of pathology-specific exposure in medical school. This results in an immense learning curve during early training, which includes simultaneously learning microscopy of all organ systems, reporting nomenclature, laboratory technical skills and laboratory workflow, thereby contributing to learner stress, overwhelm and anxiety from the high cognitive load.

"Learning normal **histology** can be very daunting especially because you're often [learning] different organ systems all at once... but [then] you're also being given slides that have **pathology** on them, and then on top of that, I was expected to be **trying to sign out reports**. You're also trying to navigate this **EMR** system and figure out how to format the reports and **how to write a diagnostic line**. So it's just **cognitive overload**... and that's just for the microscopy side... on top of that, you're also **learning how to fresh, how to gross and then autopsy** as well... it's almost like starting from scratch." - transcript D, lines 21-29

"I just had **no idea where to start**... I had an incredible amount of **anxiety** because I just had no idea whether or not I was even doing the right thing." - transcript F, lines 17 and 198

Lack of pathology-specific training in medical school is not a problem caused by pathology residency training programs, but one in which they must recognize and manage accordingly.

"I don't think that's on the medical school to have taught me those things. I think that're more on the residency programs for their **onboarding process** for new residents" - transcript A, line 206

Recognition of the high cognitive load early trainees face, alongside a level-appropriate on-boarding process can help mitigate the problem and promote learner morale. An on-boarding process that includes structured learning plans that incorporate level-appropriate resources, level-appropriate learning objectives and categorical learning, enhance learning by providing a solid foundational knowledge-base that one can build off in future training.

"I really love the module that was developed and the week-by-week topics were really helpful. You're not just one day reading about breast and the next day reading about GI... you're developing a **foundation** and then **building and scaffolding** on top of it." - transcript B, line 128

In early training, a sense of sufficient independent study time enables an opportunity for self-directed learning to fill knowledge gaps and solidify concepts encountered in patient cases, which in turn enables a deeper understanding of pathology material and increased knowledge retention and competence.