

JSGS 858 Enterprise Information Management

UNIVERSITY OF REGINA CAMPUS	
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OFFICE LOCATION:	Room 334.7, 2155 College Avenue (CB)
TERM:	Winter 2021
CLASSROOM(S):	Online
DATE AND TIME:	TBD

CALENDAR DESCRIPTION

An in-depth analysis of the health information critical to health care operations, the administration of enterprise information governance with a focus on information as a strategic asset, and the important functions of health information professionals in leadership and management. Students will develop skills in strategic planning and project management to lead the implementation of health information systems and technologies and design the processes, policies and procedures that govern the use of such systems and technologies in practice. This course is explicit in its examination of implementation, context and complexity and emphasizes the uses of data, information and knowledge for health systems, organizational and individual planning and decision-making.

COURSE CONTENT AND APPROACH

Each week consists of a lecture covering the weekly topic and interactive in-class activities and discussion. Live classes will be recorded for students who are unable to attend and office hours are available by appointment.

The course is designed for applied learning with pre-work activities. Students will consider the factors that influence decision-making in health care, understand health information problems from various perspectives, and examine how to work collaboratively as cross-functional health informatician leaders. After completion of the course, students will have gained important skills to strengthen the capacity of organizations to harness information for improved health care performance and population health. Several practice-based methods and tools for organizational change will be introduced. Students will practice generating business intelligence through the use of realistic data and scenarios within an academic EHR environment.

Learning Objectives:

- Explain the broader context of digital health, including the current state and landscape of digital health policy in Canada
- Identify the main actors shaping national-provincial eHealth policy, their roles and relationships, and the strategic aims of institutional and organizational initiatives
- Identify the data, information and knowledge management needs of the health enterprises, align functional requirements with business needs, and assess impacts of changes on the organization
- Design governance models to enhance health information services and delivery
- Describe the volume, complexity and variety of data and information collected and exchanged within the health sector and the strategic imperative for enterprise information management of health data and information assets
- Monitor and evaluate information continuity in health care and apply various techniques for modelling workflow and processes within health care enterprises such as network mapping and data visualization
- Use service design methodology to improve patient flow, care coordination, and integration of services
- Apply leadership theory and methods, including the demonstration of multidisciplinary and cross-functional leadership, communication and stakeholder management
- Explain the drivers for change and new and emergent roles within the HIIM field, including that of the chief health information management officer
- Define hidden articulation work and the clinical, financial, technological and administrative bridging roles of HIIM professionals at all levels of the health system
- Explain the importance of enterprise information management for accountability, patient safety and quality care
- Oversee the management of HIM departments, including in-service training and continuing education and the monitoring of employee productivity and coding service quality
- Understand the role of information in meeting various regulatory compliance requirements
- Develop a business case for the regulation of critical health information activities to ensure enterprise-wide standardization, consistency, improved data quality, and information integrity
- Advocate and champion health care modernization and transformation through the strategic and effective use of health information and technology
- Apply implementation science to enterprise information management, including the strategic and tactical implementation of complex, multifaceted health information innovations in health service organizations
- Generate business intelligence in EHR environments



COURSE TEXTBOOKS

Required Resources:

EHR go is a cloud-based online platform that does not require any special downloads or plugins. All activities completed within the EHR can be exported in various formats and then uploaded on to the UR Courses LMS for grading and reporting. Students will require a subscription to access EHR Go, which can be purchased online. EHR Go Subscription: <https://web21.ehrgo.com/register>.

Please create your EHR Go account by going to: <https://ehrgo.com>. Select Subscribe in the upper, right corner and enter the following HIIM Student Program Key: **S63E76**. Follow the on-screen instructions to create your account and apply your subscription. Refer to the student guide for more information: <https://ehrgo.com/student-guide/>. There are several subscription terms available and the students are welcome to choose which works best for them; however, quarter coverage is recommended for this course (\$45 USD). The subscription does not start until the student activates on the EHR Go site.

Supplementary Resources:

If you would like to purchase a supplementary textbook, you may choose among the following recommended resources:

- Enterprise Health Information Management and Data Governance. American Health Information Management Association; 1st edition (March 23, 2015)
- Abdelhak, M., & In Hanken, M. A. (2016). Health information: Management of a strategic resource.
- Abrams, K.J., Learmonth, S., Gibson C.J. (2017). The Canadian Health Information Management Lifecycle. Canadian Health Information Management Association (CHIMA)
- Glaser, Salzberg, & Salzberg, Claudia. (2011). The strategic application of information technology in health care organizations (3rd ed.). San Francisco: Jossey-Bass. (Free)



COURSE OUTLINE AND ASSIGNMENTS

The entire course will be available from the start of the classes. All assessed elements are to be submitted by stated deadlines. A poll will be sent out one-week in advance of the course to determine the best available days and times to schedule live seminar sessions – syllabus and UR Courses calendar will be updated accordingly. Live sessions will be recorded and posted on UR Courses within 72 hours.

Each student will be evaluated based on the following:

1. 3 x Discussion Forum Posts	15%
Post 1 original post and 1 follow-up post in class forum	5% Each
2. 25 x Simulated Practical Assignments	50%
EHR Go activities throughout course (approx. 2 exercises due per week)	2% Each
3. Business Intelligence Assignment	35%
Business Intelligence using Utilization Management Data	
	100%

Module 1 – eHealth and Health Information Services in Canada – January 11th -17th

Pre-work:

- Briefly introduce yourself and share your personal learning objectives for JSGS 858 on Flipgrid.



Discussion Forum #1: (answer one)

- Review the website of an F/P/T information agency or organization. What essential services or functions do health agencies provide to the Canadian health care system? Are the services or functions mostly consumer, provider, or health service-centred? How do their activities relate to overall health system activities? Are there similar agencies/organizations within its jurisdiction duplicating these efforts? Does the agency/organization collaborate with others to accomplish shared health system goals in the health information sector, and if so, how does it work collaboratively?
- In Oh et al, 2005, the authors argue that it is unclear how eHealth will change relationships, understandings, and interactions within the health care system. More than a decade has passed since their article, how do you think eHealth has shaped the health care system during this time?
- Describe the pros and cons of centralized versus decentralized health information systems and services. In what ways does a health systems' governance structure impact its ability to design and deliver centralized versus decentralized information service models? How can digital health help address the fragmentation of care and enable more integrated health systems?



Self-directed Learning Modules

- 'Introduction to Enterprise Information Management'
- 'Structure and Dynamics of Health Information Organizations in Health Systems'



Practical Assignment (EHR Go)

Activity Title	EHR Go Assignment Link	Estimated Time for Completion
EHR Orientation	https://web21.neehrperfect.com/rd/?courseActivityId=63	50 minutes
Structured and Unstructured Data	https://web21.ehrgo.com/rd/?courseActivityId=12637	60 minutes
Orientation to Data Analytics I	https://web21.ehrgo.com/rd/?courseActivityId=13691	60 minutes

Readings:

Baumgart, D.C. (2020) Digital advantage in the COVID-19 response: perspective from Canada’s largest integrated digitalized healthcare system. npj Digit. Med. 3, 114.

Coiera E. (2009). Building a national health IT system from the middle out. Journal of the American Medical Informatics Association : JAMIA, 16(3), 271–273.

Daniels T. 2014. Implementing e-Health through CHI: A Very Canadian Solution to a Very Canadian Problem. Health Reform Observer - Observatoire des Réformes de Santé2 (3): Article 1.

Forest P, Martin D. Fit for purpose: findings and recommendations of the external review of the pan-Canadian health organizations. Ottawa: Health Canada; 2018.

Holmgren, JA & Ford EW. (2018). Assessing the impact of health system organizational structure on hospital electronic data sharing, Journal of the American Medical Informatics Association, Volume 25, Issue 9, , Pages 1147–1152

Kierkegaard, P. (2015). Governance structures impact on eHealth, Health Policy and Technology, Volume 4, Issue 1, Pages 39-46,

Neufeld, D. (2011.). Canada Health Infoway. Ivey ID: 9B10E019. London, Canada: Ivey Publishing.

Noseworthy, T. (2015). We Thought We Were on Top: A Commentary on “Implementing e-Health through Canada Health Infoway” by Tom Daniels. Health Reform Observer - Observatoire des Réformes de Santé3 (1): Article 5.

Oh, H., Rizo, C., Enkin, M., & Jadad, A. (2005). What is eHealth (3): a systematic review of published definitions. Journal of medical Internet research, 7(1), e1.

Shortell, S., and Mccurdy, R. (2009). Integrated health systems. Information Knowledge Systems Management, 8: 369-382.

Vogel, L. (2015). Infoway is shifting, not shuttering: Alvarez. CMAJ Feb 2015, 187 (2) E59-E60.

Zimlich E, Rosenblum R, Salzberg CA, et al. Lessons from the Canadian national health information technology plan for the United States: opinions of key Canadian experts. J Am Med Inform Assoc 2012;19:453–9 .

Module 2 –Data and Information Governance/Health Information Exchange – January 18th – 31st | Live Seminar: Date TDB



Self-directed Learning Modules

- ‘Data and Information Governance’



Practical Assignment (EHR Go)

Activity Title	EHR Go Assignment Link	Estimated Time for Completion
Orientation to Data Visualization IV	https://web21.ehrgo.com/rd/?courseActivityId=13697	60 minutes
Applied Data Analytics II	https://web21.ehrgo.com/rd/?courseActivityId=13693	90 minutes
Quality Improvement with the EHR	https://web21.ehrgo.com/rd/?courseActivityId=12593	60 minutes
Retrieval of Data	https://web21.neehrperfect.com/rd/?courseActivityId=11614	75 minutes

Readings:

- Adler-Milstein, J., and Jha, A. (2012). Sharing clinical data electronically: a critical challenge for fixing the health care system. *JAMA*, 307(16): 1695-1696.
- Borek, Alexander. (2014). Data and Information Assets (Chapter 1). In *Total Information Risk Management Maximizing the Value of Data and Information Assets* (First Ed.). Waltham, MA: Morgan Kaufmann.
- Byerring, AK, Brownell, M, El Emam, K, Fortier, I, Henry, D, Knoppers, BM, Laurie, G, Lemmens, T, Morgan, M, Noseworthy, TW, Saunders, S, Wolfson, M & Zelmer, J 2015, *Accessing Health and Health-Related Data in Canada: The Expert Panel on Timely Access to Health and Social Data for Health Research and Health System Innovation*. Council of Canadian Academies
- Discharge Abstract Database (DAD) Re-abstraction Studies:
<https://secure.cihi.ca/estore/productSeries.htm?pc=PCC228>
- Hovenega, E.J. & Grain, H. Health data and data governance. *Studies in Health Technology and Informatics*, 2013; 193:67-92
- Sarsfield, S. (2009). *The Data Governance Imperative*. IT Governance Publishing.
- Soares, S. (2015). *Data Governance Tools: Evaluation Criteria, Big Data Governance, and Alignment with Enterprise Data Management*, MC Press, 2015. ProQuest Ebook Central. Chapter 18: Big Data Governance to Reduce the Readmission Rate for Patients with Congestive Heart Failure
- Stambaugh, R. (2018). Data governance has an inextricable link to information governance. *Journal of AHIMA*. 2018
- University of Victoria. EHealth Observatory: Workflow Modelling Tools:
<https://ehealth.uvic.ca/resources/tools/WorkflowModeling/WorkflowModeling.php>
- Vayena, E., Dzenowagis, J., Brownstein, J., and Sheikh, A. (2018). Policy implications of big data in the health sector. *Bulletin of the World Health Organization*, 96: 66-68.

Module 3 – Workflow Analysis and Process Redesign – February 1st – 6th Lab Demonstration – Creating Flow Diagrams in MS Visio: Date TDB



Discussion Forum #2: (answer one)

- Describe how social network analysis can be used to analyze health system structures, especially relational structures and networks, and the patterns and flow of information exchange within health organizations and systems. Describe other, perhaps simpler, methods that can be used by HIIMs to inform workflow analysis and process redesign.
- Consider the key components of the electronic health record (e.g, see EHR Blueprint). How can electronic health records be optimized to support clinical and operational workflow?
- Explain interdependencies across the four levels of interoperability (foundational, structural, semantic, and organizational). Provide an example relevant to health care for each type of interoperability.



Self-directed Learning Modules

- ‘Workflow Analysis and Process Redesign’



Practical Assignment (EHR Go)

Activity Title	EHR Go Assignment Link	Estimated Time for Completion
Applied Data Analytics III	https://web21.ehrgo.com/rd/?courseActivityId=13695	110 minutes
Clinical Reminder Data Visualization V	https://web21.ehrgo.com/rd/?courseActivityId=13699	90 minutes
Analysis of Clinician Communication	https://web21.neehrperfect.com/rd/?courseActivityId=11656	75 minutes

Readings:

Cain C, Haque S. (2008). Organizational workflow and its impact on work quality. In: Hughes RG, ed. Patient Safety and Quality: An Evidence-Based Handbook for Nurses. Advances in Patient Safety. Rockville, MD: Agency for Healthcare Research and Quality (US); 217-244.

Cusack CM, Hook JM, McGowan J, Poon EG, Zafar A. Evaluation Toolkit—Health Information Exchange Projects: 2009 Update (Prepared for the AHRQ National Resource Center for Health Information Technology under Contract No. 290-04-0016.) AHRQ Publication No. 10-0056-EF. Rockville, MD: Agency for Healthcare Research and Quality. March 2010.

Electronic Health Record Deployment Techniques: Workflow Analysis: EHR Deployment Techniques: <https://www.chcf.org/publication/electronic-health-record-deployment-techniques/>

Finnell, J., & Dixon, B. (2016). Clinical Workflow Analysis, Process Redesign, and Quality Improvement. In Clinical Informatics Study Guide Text and Review (1st ed. 2016. ed.).

Gardner, K., Banfield, M., McRae, I. et al. (2014). Improving coordination through information continuity: a framework for translational research. BMC Health Serv Res 14, 590.

Kuziemsky, CE & Peyton, L. (2016). A framework for understanding process interoperability and health information technology, Health Policy and Technology, Volume 5, Issue 2, 196-203.

Ozkaynak, M., Unertl, K., Jihnsn SA, Brixey JJ, Haque SN. (2016). Clinical workflow analysis, process redesign and quality improvement: Case Vignette In Clinical Informatics Study Guide

Patey, C, Asghari, S, Norman, P, Hurley, O. (2020). Redesign of a rural emergency department to prepare for the COVID-19 pandemic. CMAJ, 192 (19) E518-E520;

Rotter, T., Kinsman, L., James, E.L., Machotta, A., Gothe, H., Willis, J., Snow, P., and Kugler, J. (2010). Clinical pathways: effects on professional practice, patient outcomes, length of stay and hospital costs. Cochrane Database of Systematic Reviews, 3.

Singh, R., Singh, A., Singh, D. R., & Singh, G. (2013). Improvement of workflow and processes to ease and enrich meaningful use of health information technology. Advances in medical education

and practice, 4, 231–236. <https://doi.org/10.2147/AMEP.S53307er> International Publishing Switzerland.

Tolentino, DA. (2020). Subbian, Vignesh4; Gephart, Sheila M.5 Applying Computational Ethnography to Examine Nurses' Workflow Within Electronic Health Records, Nursing Research

Unertl, K. M., Novak, L. L., Johnson, K. B., & Lorenzi, N. M. (2010). Traversing the many paths of workflow research: developing a conceptual framework of workflow terminology through a systematic literature review. Journal of the American Medical Informatics Association : JAMIA, 17(3), 265–273.

Workflow assessment for health IT toolkit. (2015). <https://digital.ahrq.gov/health-it-tools-and-resources/evaluation-resources/workflow-assessment-health-it-toolkit>

Read one of the following:

Contandriopoulos, D., Benoît, F., Bryant-Lukosius, D. et al. (2017). Structural analysis of health-relevant policy-making information exchange networks in Canada. Implementation Sci 12, 116.

De Brún, A., & McAuliffe, E. (2018). Social Network Analysis as a Methodological Approach to Explore Health Systems: A Case Study Exploring Support among Senior Managers/Executives in a Hospital Network. International journal of environmental research and public health, 15(3), 511.

Scott, J., Tallia, A., Crosson, J. C., Orzano, A. J., Stroebel, C., DiCicco-Bloom, B., O'Malley, D., Shaw, E., & Crabtree, B. (2005). Social network analysis as an analytic tool for interaction patterns in primary care practices. Annals of family medicine, 3(5), 443–448.

Tighe PJ, Smith JC, Boezaart AP, Lucas SD. (2012). Social network analysis and quantification of a prototypical acute pain medicine and regional anesthesia service. Pain Med. Jun;13(6):808-19.

Module 4 – Human Resources Management – February 7th – 14th



Practical Assignment (EHR Go)

Activity Title	EHR Go Assignment Link	Estimated Time for Completion
Assessing Employee Productivity	https://web21.neehrperfect.com/rd/?courseActivityId=11569	60 minutes
Query - Basic Orientation	https://web21.ehrgo.com/rd/?courseActivityId=23489	20 minutes

Readings:

Abrams KJ. Leadership and Health Information Management in Canada (unpublished doctoral dissertation). 2016. (Browse this reading)

Bossen C, Pine KH, Cabitza F, Ellingsen G, Piras EM. (2019). Data work in healthcare: An Introduction. Health Informatics Journal 25(3):465-474. **(Read the introduction and one article of interest from the data work in healthcare special issue)**

Last updated: 2020-07-14

Butler-Henderson K, Gray K, Greenfield D, et al. (2017). The Development of a National Census of the Health Information Workforce: Expert Panel Recommendations. *Stud Health Technol Inform*;239:8–13

Canada Health Infoway, COACH: Canada’s Health Informatics Association, Information and Communications Technology Council, Canadian Health Information Management Association, and ITAC Health. (2019). “Health Informatics & Health Information Management Human Resources - Outlook 2014 - 2019. Available at: <https://www.echima.ca/uploaded/pdf/reports/HI-HIM-HR-Outlook-Report-Final-w-design.pdf>

Hersh W. (2010). The health information technology workforce: estimations of demands and a framework for requirements. *Appl Clin Inform*;1:197–212.

Ingebrigtsen T, Georgiou A, Clay-Williams R, Magrabi F, Hordern A, Prgomet M, Li J, Westbrook J, Braithwaite J. The impact of clinical leadership on health information technology adoption: systematic review. *Int J Med Inform*;83(6):393-405.

Marc D, Butler-Henderson K, Dua P, et al. (2019). Global Workforce Trends in Health Informatics & Information Management. *Stud Health Technol Inform*;264:1273–7.

Stanfill MH, Marc DT. (2019). Health Information Management: Implications of Artificial Intelligence on Healthcare Data and Information Management. *Yearb Med Inform*;28:56–64.

Module 5 – Reimbursement Methodologies/Methods of Funding – February 15th –March 7th (Reading Week: February 21st – 28th) | Live seminar: Date TDB



Practical Assignment (EHR Go)

Activity Title	EHR Go Assignment Link	Estimated Time for Completion
Query - Advanced Orientation	https://web21.ehrgo.com/rd/?courseActivityId=23483	30 minutes
Query - Readmission Analysis	https://web21.ehrgo.com/rd/?courseActivityId=23505	60 minutes
Query - Pneumonia Outcomes	https://web21.ehrgo.com/rd/?courseActivityId=23503	35 minutes
Query - Adverse Drug Events	https://web21.ehrgo.com/rd/?courseActivityId=23487	30 minutes
Query - Local Mortality Data	https://web21.ehrgo.com/rd/?courseActivityId=23501	45 minutes
Query - Colorectal Screen	https://web21.ehrgo.com/rd/?courseActivityId=23493	25 minutes

Readings:

- Böcking, W., Ahrens, U., Kirch, W. et al. First results of the introduction of DRGs in Germany and overview of experience from other DRG countries. *J Public Health* 13, 128–137 (2005).
<https://doi.org/10.1007/s10389-005-0103-4>
- Britton J. R. (2015). Healthcare Reimbursement and Quality Improvement: Integration Using the Electronic Medical Record Comment on "Fee-for-Service Payment--an Evil Practice That Must Be Stamped Out?". *International journal of health policy and management*, 4(8), 549–551.
- Bureau, V, Dahl, HM, Jensen, LG, Lou, S. (2018). Beyond Activity Based Funding. An experiment in Denmark, *Health Policy*, Volume 122, Issue 7, Pages 714-721.
- Camillo, C. (2016). CHIP Data in the Medicaid Statistical Information System (MSIS): Availability and Uses. 10.13140/RG.2.1.1945.1926.
- Canadian Patient Cost Database Technical Document: MIS Patient Costing Methodology, January 2019
- Chum F, Ohinmaa, A, Kaul, P. (2016). Canadian Case Mixed Groups (CMG+) Costing Proxy for Acute Myocardial Infarction. *Journal of Health & Medical Economics*: <https://health-medical-economics.imedpub.com/canadian-case-mixed-groups-cmg-costing-proxy-for-acute-myocardial-infarction.php?aid=9466>
- CIHI: The why, the What and the How of Activity-Based Funding in Canada: A Resource for Health System Funders and Hospital Managers
- Finnell, J., & Dixon, B. (2016). Strategic and Financial Planning for Clinical Information Systems. In *Clinical Informatics Study Guide Text and Review* (1st ed. 2016.. ed.).
- Heslop, L. (2019). Activity-based funding for safety and quality: A policy discussion of issues and directions for nursing-focused health services outcomes research. *International Journal of Nursing Practice*, 25(5).
- Palmer, K. S., Agoritsas, T., Martin, D., Scott, T., Mulla, S. M., Miller, A. P., Agarwal, A., Bresnahan, A., Hazzan, A. A., Jeffery, R. A., Merglen, A., Negm, A., Siemieniuk, R. A., Bhatnagar, N., Dhalla, I. A., Lavis, J. N., You, J. J., Duckett, S. J., & Guyatt, G. H. (2014). Activity-based funding of hospitals and its impact on mortality, readmission, discharge destination, severity of illness, and volume of care: a systematic review and meta-analysis. *PloS one*, 9(10)
- Patient Classification Systems International: 2011 Case Mix Conference : Meeting abstracts. Available at <https://bmchealthservres.biomedcentral.com/articles/supplements/volume-11-supplement-1>
- Perry S, Homan C. Use of case mix tools for utilization management and planning. *Stud Health Technol Inform*. 2009;143:496-500.
- Porter, M.E., and Teisberg, E.O. (2006). *Redefining Health Care: Creating Value-based Competition on Results*. Boston: Harvard Business School Press.
- Sutherland JM, Botz CK (2006) The effect of misclassification errors on case mix measurement. *Health Policy* 79:195-202.
- Sutherland JM, Liu G, Crump RT, Law M. Paying for volume: British Columbia's experiment with funding hospitals based on activity. *Health Policy*. 2016 Nov;120(11):1322-1328.
- Tan JY, Senko C, Hughes B, Lwin Z, Bennett R, Power J, Thomson L. (2020). Weighted activity unit effect: evaluating the cost of diagnosis-related group coding. *Intern Med J*.
- Trenaman L, Sutherland JM. (2020). Moving from Volume to Value with Hospital Funding Policies in Canada. *Healthc Pap*. 2020 May;19(2):24-35.
- University of British Columbia: Evidence and Perspectives on Funding Healthcare in Canada: <https://healthcarefunding.ca/> (Go to sections on activity-based funding and integrated models)

Last updated: 2020-07-14

Weir, S, Steffler, M, Li, Y, Shaikh, A Wright, JG, Kantarevic J. (2020). Use of the Population Grouping Methodology of the Canadian Institute for Health Information to predict high-cost health system users in Ontario CMAJ, 192 (32) E907-E912

Zahraa, A. (2017). Data Analytics of Codified Patient Data: Identifying Factors Influencing Coding Trends, Productivity, and Quality. University of Pittsburgh (**Read Abstract Only**).

**Module 6 – Business Intelligence/Utilization Management – March 8th – March 21st |
Lab – Descriptive Analysis and Data Presentation in Excel & SPSS – Part 1:
Creating Dashboards in Tableau: Dates TDB**



Practical Assignment (EHR Go)

Activity Title	EHR Go Assignment Link	Estimated Time for Completion
Query - Influenza Vaccine	https://web21.ehrgo.com/rd/?courseActivityId=23499	30 minutes
Query - Childhood Immunizations	https://web21.ehrgo.com/rd/?courseActivityId=23491	30 minutes
Query - Smoking Cessation	https://web21.ehrgo.com/rd/?courseActivityId=23507	30 minutes
Query - Hospital Acquired Conditions	https://web21.ehrgo.com/rd/?courseActivityId=23497	75 minutes
Query - Culture & Susceptibility Data	https://web21.ehrgo.com/rd/?courseActivityId=23495	75 minutes
Query - Average Length of Stay	https://web21.ehrgo.com/rd/?courseActivityId=23485	60 minutes

Readings:

Ben-Assuli, Ofir, Shabtai, Itamar, & Leshno, Moshe. (2015). Using electronic health record systems to optimize admission decisions: The Creatinine case study. Health Informatics Journal, 21(1), 73-88.

Canada Institute for Health Information: Indicator Library:

https://indicatorlibrary.cihi.ca/display/HSPIL/Indicator+Library?desktop=true&_ga=2.209954709.1261785772.1608318093-384899413.1598544363

Elina Farmanova, Christine Kirvan, Jennifer Verma, Geetha Mukerji, Nurdin Akunov, Kaye Phillips, Stephen Samis, Triple Aim in Canada: developing capacity to lead to better health, care and cost, International Journal for Quality in Health Care, Volume 28, Issue 6, December 2016, Pages 830–837,

Fekri O, Manukyan E, Klazinga N. Appropriateness, effectiveness and safety of care delivered in Canadian hospitals: a longitudinal assessment on the utility of publicly reported performance trend data between 2012–2013 and 2016–2017 BMJ Open 2020;10

Last updated: 2020-07-14

- Fertel, B. S., Hart, K. W., Lindsell, C. J., Ryan, R. J., & Lyons, M. S. (2012). Toward understanding the difference between using patients or encounters in the accounting of emergency department utilization. *Annals of emergency medicine*, 60(6), 693–698.
- Health PEI: Emergency Health and Planning Services 2017 - 2020 Patient Flow and System Utilization Strategy. Available at https://www.princeedwardisland.ca/sites/default/files/publications/patient_flow_and_system_utilization_strategy_2017-2020.pdf (*data-driven patient flow/utilization strategy example*)
- Kreindler SA. (2017). Six ways not to improve patient flow: a qualitative study. *BMJ Quality & Safety*;26:388-394.
- Kroneman M, Siegers JJ. The effect of hospital bed reduction on the use of beds: a comparative study of 10 European countries. *Soc Sci Med*. 2004 Oct;59(8):1731-40.
- Mamdani, M, Laupacis A. (2018). Laying the digital and analytical foundations for Canada’s future health care system. *CMAJ*, 190 (1) E1-E2.
- OECD (2017), “Hospital beds”, in *Health at a Glance 2017: OECD Indicators*, OECD Publishing, Paris. DOI: https://read.oecd-ilibrary.org/social-issues-migration-health/health-at-a-glance-2017_health_glance-2017-en#page8 (read Chapters 5, 6 & 9).
- Sheps SB, Anderson G, Cardiff K. Utilization management: a literature review for Canadian health care administrators. *Healthc Manage Forum*. 1991 Spring;4(1):34-9. doi: 10.1016/S0840-4704(10)61234-3.
- Sutherland, J. M., & Crump, R. T. (2013). Alternative level of care: Canada's hospital beds, the evidence and options. *Healthcare policy / Politiques de sante*, 9(1), 26–34.
- Tomzik, Kristine M. (2008). "Fraud, Waste and Abuse: What's Hiding in Your Utilization Data?." 2008 AHIMA Convention Proceedings, October 2008.
- van de Vijssel, A.R., Heijink, R. & Schipper, M. Has variation in length of stay in acute hospitals decreased? Analysing trends in the variation in LOS between and within Dutch hospitals. *BMC Health Serv Res* 15, 438 (2015).

Module 7 – Implementation Science – March 22nd – 28th | Live Seminar: Date TDB



Self-directed Learning Modules

- ‘Implementation Science in eHealth’



Discussion Forum #3 (answer one):

- What does the evidence say about the impacts of eHealth in Canada? What gaps in evidence exist? How can health technology assessment and benefits evaluation be used to guide investment in digital health innovation? How might HTA and benefits evaluation support decisions about whether to de-implement costly digital health innovations that have shown to

be less effective? Why might it be necessary to consider systems maturity before making de-implementation decisions?

- Explain some of the challenges with integrating legacy information systems? How should health service organizations modernize and/or responsibly transition the use of legacy systems?
- Explain the concept of implementation failure? Why do you think large-scale digital health projects often fail? How can organizations identify barriers to implementation and tailor their implementation strategy to improve organizational readiness before, during, and after 'adopting' digital health innovations?
- Explain the differences between implementation effectiveness and intervention effectiveness and the relationship between implementation and intervention effects.
- Describe the stages of implementation. Why do you think the stage of sustainability is often overlooked? How can organizations move toward increasingly mature and meaningful use of health information and systems by planning and budgeting for longer-term scale-up and sustainability earlier in the process?
- In what ways can healthcare leaders champion and advocate for digital health project implementation? Why is health care leadership so critical to implementation success?



Practical Assignment (EHR Go)

Activity Title	EHR Go Assignment Link	Estimated Time for Completion
Implementing Clinical Decision Support	https://web21.ehr.go.com/rd/?courseActivityId=12568	75 minutes

Readings:

Abbott, PA, Foster, J, Marin, HF, Dykes, PC. (2014). Complexity and the science of implementation in health IT—Knowledge gaps and future visions, *International Journal of Medical Informatics*, Volume 83, Issue 7, Pages e12-e22

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- Espahbodi, R., Vaidyanathan, G. (2020.). *Midwest Health System: Information System Risks and Controls*. Ivey ID: 9B19E023. London, Canada: Ivey Publishing.
- Gheorghiu, B., and Hagens, S. (2016). Measuring interoperable EHR adoption and maturity: a Canadian example. *BMC Medical Informatics and Decision Making*, 16: 8.
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- Grimshaw JM, Patey AM, Kirkham KR, et al. De-implementing wisely: developing the evidence base to reduce low-value care *BMJ Quality & Safety* 2020;29:409-417.
- Henshall, C., Schuller, T., and Mardhani-Bayne, L. (2012). Using health technology assessment to support optimal use of technologies in current practice: the challenge of "disinvestment". *International Journal of Technology Assessment in Health Care*, 28(3): 203-210.
- Laukka, E.; Huhtakangas, M.; Heponiemi, T.; Kanste, O. Identifying the Roles of Healthcare Leaders in HIT Implementation: A Scoping Review of the Quantitative and Qualitative Evidence. *Int. J. Environ. Res. Public Health* 2020, 17, 2865.
- Mairer, C., C. (2015.). *Project Hugo at LHSC: Leading Urgent Change in Healthcare*. Ivey ID: 9B11C038. London, Canada: Ivey Publishing.
- Meister, D., Mark, L. (2010.). *University Health Network (UHN): The MOE-MAR Initiative*. Ivey ID: 9B06e013. London, Canada: Ivey Publishing.
- Sligo, J, Roberts, V, Gauld, R, Villa, L, Thirlwall, S. (2019). A checklist for healthcare organisations undergoing transformational change associated with large-scale health information systems implementation, *Health Policy and Technology*, Volume 8, Issue 3, Pages 237-247

Module 8 – Learning Health Systems - March 29th – April 11th | Live Seminar: Date TDB



Self-directed Learning Modules

- ‘Designing Learning Health Systems’

Readings:

- Bindman, A., Pronovost, P., and Asch, D. (2018). Funding innovation in a learning health care system. *JAMA*, 319(2): 119-120.
- Budrionis, A., and Bellika, G. (2016). The learning healthcare system: Where are we now? A systematic review. *Journal of Biomedical Informatics*, 64: 87-92.
- Chambers, D., Feero, W., and Khoury, M. (2016). Convergence of implementation science, precision medicine, and the learning health care system: a new model for biomedical research. *JAMA*, 315(18): 1941-1942.
- D'Avoilio, L., Ferguson, R., Goryachev, S., Woods, P., Sabin, T., O'Neil, J., Conrad, C., Gillon, J., Escalera, J., Brophy, M., Lavori, P., and Fiore, L. (2012). Implementation of the Department of Veterans Affairs' first point-of-care clinical trial. *J Am Med Inform Assoc*, 19(1): 170-176.
- Etheredge, L. (2007). A Rapid-Learning Health System. *Health Affairs*, 26(2): 107-118.

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- Friedman, C.P., Rubin J.C., and Sullivan K.J. (2017). Toward an Information Infrastructure for Global Health Improvement. *Yearbook of Medical Informatics*, 26(1): 16-23.
- Gardner, W. (2015). Policy capacity in the learning healthcare system: comment on health reform requires policy capacity. *International Journal of Health Policy and Management*, 4(12): 841-843.
- Institute of Medicine. (2007). *The Learning Healthcare System: Workshop Summary*. Washington DC: Institute of Medicine (US) Roundtable on Evidence-Based Medicine.
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- Krumholz, H.M. (2014). Big data and new knowledge in medicine: the thinking, training, and tools needed for a learning health system. *Health Affairs*, 33(7): 1163-1170.
- Lavis JN, Gauvin F-P, Reid R, Bullock H, Wodchis W, Hayes A. Rapid synthesis: Creating a rapid-learning health system in Ontario. Hamilton, Canada: McMaster Health Forum, 31 March 2018.
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- Meneer, M., Blanchette, M., Demers-Payette, O. et al. A framework for value-creating learning health systems. *Health Res Policy Sys* 17, 79 (2019). <https://doi.org/10.1186/s12961-019-0477-3>
- Morain, S., Kass, N., and Grossman, C. (2017). What allows a health care system to become a learning health care system: results from interviews with health system leaders. *Learning Health Systems*, 1(1): e10015.
- National Academy of Medicine. *The Learning Health System Series*. Available at: <https://nam.edu/programs/value-science-driven-health-care/learning-health-system-series/>
- Reid, R. (2016). Embedding research in the learning health system. *HealthcarePapers*, 16(Special Issue): 30-35.
- Scobie, S, Castle-Clarke, S. Implementing learning health systems in the UK NHS: Policy actions to improve collaboration and transparency and support innovation and better use of analytics. *Learn Health Sys*. 2020; 4:e10209. <https://doi.org/10.1002/lrh2.10209>
- Touati, N., Denis, J.L., Roberge, D., and Brabant, B. (2015). Learning in Health Care Organizations and Systems: An Alternative Approach to Knowledge Management. *Administration & Society* 47(7): 767-801.
- Zelmer, J. (2016). Digital drivers in a learning health system: considerations for research innovation. *HealthcarePapers*, 16(Special Issue): 36-41.

EVALUATION

Unless otherwise specified, students will be evaluated in accordance with the JSGS Grade Descriptors of the Graduate Student Handbook

DESCRIPTION OF ASSIGNMENTS

Forum Discussion Participation – 15% (5% each)

Posts are expected on the discussion forum by 11:59 pm CST on the final day of the module.

Posts should draw on ideas and interpretations from seminars and course readings. Discussion prompts have been provided to aid in the selection of an original post topic; however, students may pose their own questions, share personal practice experience, where appropriate, or reflect on relevant stories from the news media. Contributions should be thoughtful with respectful consideration to the diverse ideas and viewpoints of others. Efforts made by students to respond to posts made by fellow students on their own thread will count favorably toward their participation mark as follows:

Grading Rubric for Asynchronous Class Discussion				
Criteria	0 points	1 point	2 - 3 points	4 - 5 points
Initial posting content	No posting is made in response to the posed question. Post is inappropriate and subsequently removed by instructor.	Response attempts to answer the question but is not specific or is vague. Appears somewhat off-topic and/or does not address main point. Response late in the module week.	Response addresses the question with thought and clarity. Applies content and material from the course readings and/or lecture content in the response. Word count for initial post is between 151 and 250 words. Response by the end of the module week.	Response addresses question with thought, clarity and analysis, showing depth of understanding through application of module content: i.e., from reading material and/or lecture content. Applies concepts outside of course content, which relate to question demonstrating thoughtful analysis through use of appropriate examples. Word count for initial post is 251 words or more.
Follow-up posts	Makes 0 posts.	Makes 1 posting. Responses are one or two sentences in length. Responds late in the module week.		Responds to question and response to one, two or more classmates with thoughtful and supportive responses by the end of the module week or earlier. One or more postings include references to class content AND related content from outside sources. Response earlier in the module week.

Practical Assignments (25x) – 50% (2% each)

Neehr Perfect[®] / EHR Go[™] is an academic EHR that houses synthetic data providing EHR-interfaced and exportable data sets at patient, organizational and population levels and across the continuum of care. It will be used primarily for a number of business intelligence query activities that when taken together will prepare students to successfully generate and report on the compilation of enterprise data used in the final assignment.

Activities are structured assignments for the EHR. Four types of activities are available and include: orientation (foundational concepts and informatics), knowledge (case study), skills (documentation practice), and application (clinical simulation) activities. Most assigned activities are application-based, including an assignment, instructions, and learning objectives. Students will submit their work by uploading the completed activity document to the UR Courses LMS and will be graded on completion (1% per assignment) and accuracy (70% or higher pass rate) (1% per assignment).

Business Intelligence and Patient Flow Assignment (35%)

Background: Canada has the third-highest bed occupancy rate and the fourth-lowest hospital discharge rate among OECD countries (OECD, 2017), an unintended consequence of reducing the number of acute care hospital beds over time due to cost-containment measures. We can use data to better manage the appropriate use of these scarce resources, reduce unnecessary costs, increase appropriate access, and improve care quality and outcomes. In the following assignment, you will generate business intelligence to address some of Canada's all too common patient flow and service utilization challenges.

Scenario: The fiscal year is 2016-2017. You are the senior analyst responsible for health analytics and insight for the assistant deputy minister responsible for capacity planning and analytics at your provincial/territorial Ministry of Health. In your province/territory, the acute care hospital inpatient bed occupancy in several facilities has been consistently high, in some cases over 95%, resulting in increased staffing and other costs.

You have been asked to evaluate service utilization trends to ensure patients receive medically necessary and appropriate care in a timely fashion. The overall objective is to reduce avoidable acute care admissions and readmissions and improve navigation and access to alternate patient care levels, where appropriate. The recommendation for intervention that you make should, at the same time, strengthen care quality and outcomes overall (i.e., careful consideration should be given to the consequences of proposed action overtime to avoid short-term actions that could adversely impact the health system in the long-term, cet. par.).

You have decided to conduct a retrospective utilization management review using **inpatient data from the Discharge Abstract Database (DAD)**. You plan to generate basic descriptive statistics on each of the following:

- The nature and volume of patients treated at the hospital (throughput)

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- Average resource intensity weight (aRIW)
- 90th percentile length of stay (LOS)
- Clinical Efficiency (Ratio of LOS to expected length of stay (ELOS))
- Median number and percentage of long stay outliers
- Proportion of alternate level of care hospitalizations and median number of days in care
- Discharge rate
- Readmission rate (excluding planned admissions)

In addition to presenting overall descriptive statistics for your province/territory, you plan to disaggregate or conduct a more focused analysis of DAD data using at least one of the following approaches:

- Trend analysis comparing performance statistics overtime (e.g., 2016-17, 2014-15, 2012-13)
- Peer hospital, regional or national comparison(s)
- By social stratifying factors (e.g., age, gender, education, employment status, financial support, mental health admission, etc.)
- Analysis by diagnosis (ICD MRDx) or intervention (CCI), outcome of interest (e.g., in-hospital mortality) or care delivery factors of interest (e.g., ED wait-time) (see: CIHI [Indicator Database](#) for commonly reported indicators using DAD data)
- Analysis of available 'special project' data (i.e., voluntary, P/T or organization-specific supplemental data collected on priority topics)

Synthesize your findings in a briefing report, which will include the presentation of results from your analysis in the form of tables, graphs and/or charts and written interpretation of key findings as appropriate. Make sure to elaborate on any limitations in your data or analysis, such as whether other information could have been helpful to know to report on utilization or data quality considerations (e.g., historical comparability).

Finally, present options and recommended strategies to improve performance in the targeted population. Where possible, use evidence to support your recommendations, which could include citing research evidence or highlighting real-world case examples in other jurisdictions where the proposed recommendation has been shown to be promising.

Examples of areas where recommendations could be targeted to improve service utilization include:

- Improvements to management of acute care hospital beds
- Improvements to alternate level of care designation processes within hospitals
- Additional modeling and analysis of care and patient data to better understand the problem
- Improvements to coordination and integration at health systems levels
- Strengthening standardized clinical pathways for transitioning patients
- Reforms to funding services that aim to improve service value and efficiency
- Other reforms to care delivery (e.g., community-based social prescribing for mental health)

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Your briefing report is worth a total of 35% of your final grade and should contain the following written sections (10 pages, single spaced 12 pt. font):

1. Title Page
2. Background (1 page)
3. Analysis & Results (6 page)
4. Recommendations (2 page)
5. Implementation Considerations (1/2 page).
6. Conclusion (1/2 page)
7. References (no page limitations)
8. Appendix (no page limitations)

Please reference the Chicago Manual of Style's author-date system or the American Psychological Association (APA) style (see the JSGS Referencing Quick Guide posted to the URCourses site or access the online version available through the University of Regina library catalogue).

Open DAD data is accessible through the ODESI digital repository (University of Regina library).

LATE ASSIGNMENTS

Assignments will be accepted through URCourses, up to the end of the course (April 15th, 2021); Any assignments that are submitted beyond the end of the course will be awarded a grade of 0. No extensions will be provided as final marks for the course need to be determined and entered by April 20th, 2020. It is envisaged that you will organize yourself to complete the assignments at your own pace throughout the period the course is running and are able to meet deadlines for individual assignments.

STUDENTS WITH SPECIAL NEEDS OR REQUIRING ACCOMMODATIONS

The University of Regina wishes to support all students in achieving academic success while enjoying a full and rewarding university experience.

The Centre for Student Accessibility upholds the University's commitment to a diverse and inclusive learning environment by providing services and support to enable students with disabilities, health conditions, illnesses and injuries, to approach their studies in an equal and effective manner. The Centre for Student Accessibility aims to encourage independence, self-advocacy, and equality for all students, while maintaining privacy and confidentiality.

Students who need these services are encouraged to register with the Centre for Student Accessibility to discuss the possibility of academic accommodations and other supports as early as possible. The deadline to register and/or request accommodation letters for instructors coincides with the W drop deadline for courses each semester. To register with the Centre for Student Accessibility, please book an appointment with an Accessibility Advisor by calling 306-585-4631. For further information on what is required to register and receive academic accommodation, please explore the Centre for Student Accessibility website.

STUDENTS EXPERIENCING STRESS

Students in this course who are experiencing stress can seek assistance from the University of Regina Counselling Services. For more information, please see the attached document, visit this website: <http://www.uregina.ca/student/counselling/contact.html>, or call (306) 585-4491 between 8:30 a.m. to 4:30 p.m. Saskatchewan time Monday to Friday.

ACADEMIC INTEGRITY AND CONDUCT

Ensuring that you understand and follow the principles of academic integrity and conduct as laid out by the University of Regina (available at <https://www.uregina.ca/gradstudies/current-students/grad-calendar/policy-univ.html#conduct>) is vital to your success in graduate school. Ensuring that your work is your own and reflects both your own ideas and those of others incorporated in your work is important: ensuring that you acknowledge the ideas, words, and phrases of others that you use is a vital part of the scholarly endeavour. If you have any questions at all about academic integrity in general or about specific issues, contact your course instructor to discuss your questions.

USE OF VIDEO AND RECORDING OF THE COURSE

Video conference sessions in this course, including your participation, will be recorded and made available only to students in the course for viewing via Canvas (U of S)/Moodle (U of R) after each session. This is done, in part, to ensure that students unable to join the session (due to, for example, issues with their internet connection) can view the session at a later time. This will also provide you the opportunity to review any material discussed at your convenience. Consent to recording is presumed by attendance at live webinars. If any students have concerns with this approach, please notify the instructor in advance of the session.

Please remember that course recordings belong to your instructor, the University, and/or others (like a guest lecturer) depending on the circumstance of each session and are protected by copyright. Students may record sessions for their own use (i.e., they are not permitted to distribute the recordings).