Experimental Medical Device Studies in Canada

Stephen A Hoption Cann, PhD
Clinical Professor
Chair, UBC Clinical Research Ethics Board
School of Population & Public Health
University of British Columbia

Health Canada Guidance for Device Studies

- In October 2018, Health Canada published a new guidance document to aid manufacturers and importers who wish to receive authorization to sell a device to a qualified investigator for the purpose of conducting investigational testing: *Applications for Medical Device Investigational Testing Authorizations Guidance Document*
- Based on the new guidance, Health Canada will issue a Letter of Authorization for investigational testing of Class III or IV medical devices, if the application meets the requirements stated in Part 3 of the Medical Devices Regulations, even if REB approval is not available at the time
- Only manufacturers and importers can apply for an authorization to conduct investigational testing on human subjects

What is a device?

- A “device” is defined as an instrument, apparatus, contrivance or other similar article, or an in vitro reagent, including a component, part or accessory of any of them, that is manufactured, sold or represented for use in:
- A. diagnosing, treating, mitigating or preventing a disease, disorder or abnormal physical state, or any of their symptoms, in human beings or animals,
- B. restoring, modifying or correcting the body structure of human beings or animals or the functioning of any part of the bodies of human beings or animals,
- C. diagnosing pregnancy in human beings or animals,
- D. caring for human beings or animals during pregnancy or at or after the birth of the offspring, including caring for the offspring, or
- E. preventing conception in human beings or animals

What isn’t a device?

- However, it does not include such an instrument, apparatus, contrivance or article, or a component, part or accessory of any of them, that does any of the actions referred to in paragraphs (A) to (E) solely by pharmacological, immunological or metabolic means or solely by chemical means in or on the body of a human being or animal
- What is the difference between a device vs a medical device?
- A ‘medical device’ means a ‘device’, but does not include any device that is intended for use in relation to animals.

Permission from Health Canada

- Drug studies:
- ‘No Objection Letter’
- Natural health products:
- ‘Notice of Authorization’
- Vaccine studies
- ‘Release Letter’
- Device studies:
- ‘Letter of Authorization’ (Investigational Testing Authorization or ITA)
- Health Canada does not approve clinical studies

Is an ITA Required?

- Medical device already on the market being evaluated for new intended uses, new populations, new materials or design changes
- YES
- Already licensed medical device used in clinician-sponsored investigation, which is not sponsored by the manufacturer, and which is not intended to generate data to support a licensing application
- NO
- Licensed medical devices used in a clinical investigation outside the scope of the authorized indications for use, but not sponsored by the manufacturer
- NO, this is considered off-label use.

Is an ITA Required?

- Basic exploratory studies are being carried out to determine whether a product has any potential utility, and the product is not represented within the context of the definition of a ‘device’ or ‘medical device’
- NO, but possibly YES
- Development, manufacture, and testing of a device conducted within a single corporate entity, no sale has occurred
- NO, however, in this case, testing must be conducted on-site and solely by the legal manufacturer.

Is an ITA required?

- Clinical drug trial using an ancillary device that is not licensed in Canada.
- YES, use of an unlicensed Class II, III, or IV medical device requires a separate ITA application
- Manufacturers should contact the Investigational Testing Division of Health Canada to determine whether an ITA application is required at: hc.it-ee.sc@canada.ca.

Data storage requirements

- Drug and vaccine studies
- The sponsor shall maintain all records referred to in this Division for a period of 25 years
- Natural health products
- The sponsor must maintain *printed* copies of all study records for a period of 25 years
- Device studies
- Medical device studies do not have specific data storage requirements – however . . .

Data storage requirements

- If it is a US regulated device study:
- For an investigator or a sponsor as per 21 CFR 812.140(d) and 21 CFR 312.62, there is a requirement for the maintenance of records for a period of 2 years after the *latter* of two occurrences:
- 1. The date when the investigation is terminated or completed, or
- 2. The date that the records are no longer needed to support a premarket approval (PMA) or new drug (NDA) application

Device classification

- Health Canada basically borrowed its classification system from the European Union's Council Directive 93/42/EEC
- Classification rules are based on: the degree of invasiveness, duration of contact, body system affected, and local *vs* systemic effects
- So, an oximeter for spot checking arterial oxygen saturation is Class II;
- A pulse oximeter used in the operating room for continuously monitoring arterial oxygenation is Class III;
- An intracardiac oximeter is Class IV

Device classification

- All devices that penetrate the body through a body orifice or that come into contact with the surface of the eye are Class II:
- Laryngoscope
- Urethral catheter
- Daily wear, soft contact lenses
- Single use vaginal dilator
- Tracheostomy tube
- Examination glove

Device classification

- However, when a device is invasive via a body orifice or in contact with the surface of the eye, and remains so for 30 consecutive days or longer, it is a Class III device:
- • Intrauterine contraceptive device (IUD)
- • Ureteral stent
- Devices which use ionizing radiation
- Gold, titanium, platinum isotope seeds
- Bone densitometer
- Computed tomography

"I don't trust those newfangled, battery-powered pacemakers."

Device classification

- Medical device that is manufactured from animal or human cells or tissues or their derivatives, or is manufactured from a product produced through the use of recombinant DNA technology is classified as Class IV:
- Tissue heart valve, Bone graft, Hyaluronic acid (animal sourced) dermal filler
- Other Class IV examples:
- Intra-aortic valvuloplasty balloon catheter, Implanted spinal cord stimulators for pain relief, Mechanical heart valve

Additive manufacturing in medicine

- Health Canada is developing a 3D-printing guidance document to provide guidance for evidence to support pre-market Class III and Class IV licence applications for implantable medical devices manufactured by 3D printing processes
- This will elaborate on pre-market licensing requirements, including additional considerations related to the design and manufacturing processes, material controls, device testing, and labelling of 3D-printed devices.

Software as a Medical Device (SaMD)

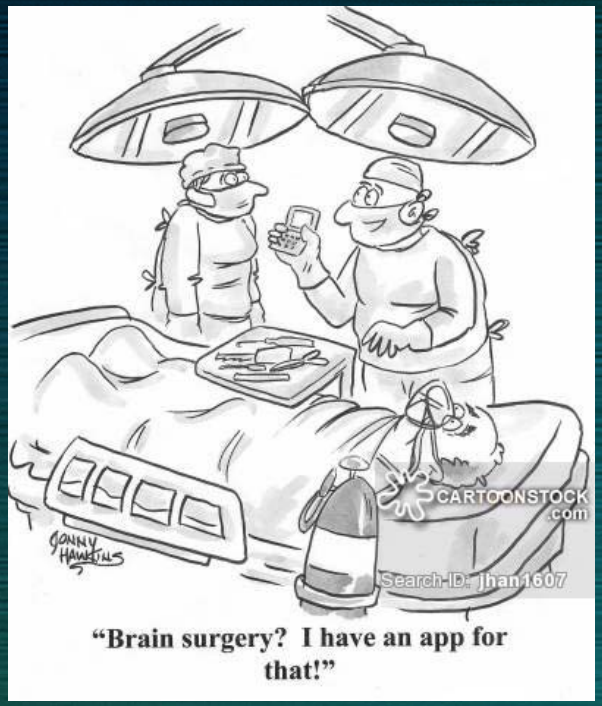
- Health Canada has developed a draft guidance document intended to provide a definition of SaMD and guidance as to how SaMD may be classified (not yet publically available).
- A Scientific Advisory Panel has been engaged to solicit feedback on the draft guidance prior to external consultation as well as provide comments on the future of medical device software including SaMD and Health Canada's regulatory approach.

Software as a Medical Device (SaMD)

- Defined as software intended to be used for one or more medical purposes that perform these purposes without being part of a hardware medical device.
- in-vitro diagnostic (IVD) medical device.
- SaMD is capable of running on general purpose (non-medical purpose) computing platforms
- SaMD may be used in combination (e.g., as a module) with other products including medical devices;
- SaMD may be interfaced with other medical devices, including hardware medical devices and other SaMD software, as well as general purpose software
- Mobile apps that meet the definition above are considered SaMD.

Software as a Medical Device (SaMD)

- INPUTS:
- Lab results, Image medical device data, Physiological status, Symptoms, etc
- ALGORITHMS
- Algorithm, Inference engine, Equations, Analysis engine Model based logic, etc, but also informed by Reference data, Knowledge base, Rules, Criteria, etc
- OUTPUTS
- SaMD defined outputs, including: Inform clinical management, Drive clinical management, Diagnose, Treat



"Brain surgery? I have an app for that!"

Software as a Medical Device (SaMD)

- FDA guidance on SaMD published in 2017
- SaMD on the health of an individual or population, to be specified as meaningful, measurable, patient-relevant clinical outcome(s), including outcome(s) related to the function of the SaMD (e.g., diagnosis, treatment, prediction of risk, prediction of treatment response), or a positive impact on individual or public health.

SaMD Definition Statement

- Intended Medical Purpose of a SaMD
  - Treat or Diagnose
  - Drive Clinical Management
  - Inform Clinical Management
- Targeted Healthcare Situation or Condition of a SaMD
  - Critical
  - Serious
  - Non-Serious

SaMD Categories

	Treat or Diagnose	Drive Clinical Mgmt	Inform Clinical Mgmt
Critical	IV	III	II
Serious	III	II	I
Non-Serious	II	I	I

Medical device cybersecurity

CYBERSECURITY NEWS

Medical Devices Reportedly Infected in Ransomware Attack

HITRUST investigations show that medical devices were infected in the recent WannaCry ransomware attack that affected 150 countries.

Hospital Medical Devices Used As Weapons In Cyberattacks

Security firm discovered malware-infected medical devices in three hospitals hit by data breaches.

Insulin pumps, heart monitors, x-ray communications systems and other medical devices already have been proven vulnerable to cyberattack by security researchers, but a new report confirms that hospital medical devices are being abused by cybercriminals and possibly cyberspies as a stepping-stone within healthcare networks to nab valuable healthcare identities and information.

Medical device cybersecurity

- Health Canada will now assess the adequacy of a manufacturer's risk control measures with respect to the cybersecurity of their medical device as part of the pre-market evaluation process.
- A guidance document will be developed to provide manufacturers of medical devices with details on the pre-market cybersecurity requirements.
- Manufacturers will be required to: identify the cybersecurity hazards associated with medical devices; to estimate and evaluate the associated risks; to control those risks; and monitor the effectiveness of their associated controls.

Medical device study registration

- Health Canada encourages manufacturers to register their clinical investigations on a publicly accessible registry which accepts international clinical trial information and which is recognized by the World Health Organisation (WHO).
- e.g. ClinicalTrials.gov and Current Controlled Trials International Standard Randomised Controlled Trials Number Register are acceptable.

Questions?

Stephen A Hoption Cann
hoption.cann@ubc.ca