

2018

HORIZON SCAN ROUNDUP

A Compilation of New and
Emerging Health Technologies
From Around the World

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2018 Horizon Scan Roundup

CADTH's Horizon Scanning Service identifies and monitors new and emerging health technologies likely to have a significant impact on health care in Canada. The Service scans and monitors health information sources to identify potentially important health technologies not yet widely used in the Canadian health care system. Summaries of current information about the use, effectiveness, cost, and implementation of some of these technologies are published regularly in CADTH bulletins and newsletters.

Part of CADTH's horizon scanning process involves monitoring new and emerging technologies identified by other international horizon scanning agencies and services. The resulting "roundup" is a compilation of more than 80 titles published in 2018 by CADTH and other agencies. These titles have been organized by medical specialty. The focus of this roundup is restricted to non-drug medical technologies including medical devices, diagnostic imaging, laboratory tests, biomarkers, programs, and procedures. For more information about the organizations whose work is included in this report, please visit their websites listed on page 5.

These horizon scanning reports were last reviewed on January 3, 2019.

Organizations Included in This Roundup

AHRQ

Agency for Healthcare Research and Quality Effective Health Care Program (US)

ASCO

American Society of Clinical Oncology (US)

ASERNIP-S

The Australian Safety and Efficacy Register of New Interventional Procedures—Surgical, Royal Australian College of Surgeons (Australia)

CADTH

Horizon Scanning (Canada)

Cleveland Clinic Innovations (US)

ECRI Institute (US)

EMCDDA

European Monitoring Centre for Drugs and Drug Addiction (Europe)

EUnetHTA

European Network for Health Technology Assessment (Europe)

HQO

Health Quality Ontario (Canada)

HTAi

Health Technology Assessment International (International)

HTAP

Washington State Health Care Authority Health Technology Assessment Program (US)

HTW

Health Technology Wales (UK)

INESSS

Institut national d'excellence en santé et en services sociaux (Canada)

ISCR

Institute for Safety, Compensation and Recovery Research (Australia)

ISPOR

International Society for Pharmacoeconomics and Outcomes Research (International)

KPMG (International)

MaHTAS

Ministry of Health, Malaysian Health Technology Assessment Section, Horizon Scanning (Malaysia)

Medgadget

The Medical Futurist

The National Academies of Sciences, Engineering, Medicine (US)

National Institute for Public Health and the Environment (Netherlands)

NICE

National Institute for Health and Care Excellence Medtech Innovation Briefings (UK)

NIHR

National Institute for Health Research (UK)

PHG Foundation (UK)

Sax Institute (Australia)

SHTG

Scottish Health Technologies Group (UK)

TAU

McGill University Health Centre Technology Assessment Unit (Canada)

WHO

World Health Organization (International)

Cancer, Imaging, and Radiology

AlignRT in Breast Cancer Radiotherapy

NICE

The AlignRT system monitors a patient's position during radiotherapy to allow adjustments for movement; for example, movement caused by breathing. The system is meant to be used in addition to existing patient positioning technologies. It can be used with different types of cancer radiotherapy. Adjusting for movement may reduce irradiation to healthy tissue adjacent to the treatment area.

AlignRT for Intracranial Stereotactic Radiosurgery

NICE

The AlignRT is a patient position monitoring system. It is used during cancer radiation therapy with a linear accelerator. In this instance, the system is used in stereotactic radiosurgery for the treatment of brain tumours. It may allow more accurate targeting of the tumour, with less irradiation to adjacent tissue. Unlike some other patient positioning systems, it does not require a head frame or bite plate, or additional radiation for visual monitoring.

Alternating Electric Fields (“Tumour-Treating Fields”) for the Treatment of Glioblastoma

CADTH

The Optune system is a wearable device that delivers alternating electric fields to the brain to disrupt cancer cell division in brain tumours. It is intended to be used in addition to standard therapies, such as surgical resection and radiation.

CancerSEEK for Early Detection and Localisation of Cancers

MaHTAS

The CancerSeek is a liquid biopsy test that analyzes genetic mutations and protein biomarkers in a blood sample to detect various types of solid tumours at an early stage. Earlier detection is intended to facilitate treatment when the cancer may be curable. The CancerSeek can detect markers for ovarian, liver, pancreatic, stomach, esophageal, colorectal, lung, and breast cancers.

CAR T-Cell Therapy

Sax Institute

An overview has been published of the state of the evidence (including clinical trials in progress) on chimeric antigen receptor (CAR) T-cell immunotherapy treatment for cancer. It examines the regulatory status of CAR T-cell therapies and highlights evidence gaps and issues that may need to be addressed as this therapy enters clinical practice.

Clinical Cancer Advances 2018

ASCO

The American Society of Clinical Oncology publishes an annual review of advances in cancer care. Some of the 2018 review highlights include CAR T-cell and other immunotherapies, gene therapy, immune checkpoint inhibitors, and precision medicine.

Colon Capsule Endoscopy (CCE-2) for the Detection of Colorectal Polyps and Cancer in Adults With Signs or Symptoms of Colorectal Cancer or at Increased Risk of Colorectal Cancer

SHTG

The CCE-2 is an ingestible capsule that contains a miniature camera. As the capsule passes through the digestive system, images from the camera are transmitted to a recording device. The images are reviewed by a clinician to determine if colorectal polyps or signs of cancer are present. In people who have received a positive screening test result for colorectal cancer, the CCE-2 may be an alternative to colonoscopy or CT colonography and may reduce the number of people referred for these procedures.

ColonFlag for Identifying People at Risk of Colorectal Cancer

NICE

The ColonFlag is a machine learning software algorithm to help identify people older than 40 years of age who may be at higher risk for colorectal cancer. It is intended to be used in addition to other screening methods for bowel cancer, such as fecal immunochemical and fecal occult blood testing.

Hydrogel Spacer to Reduce Rectal Toxicity in Prostate Cancer Radiotherapy

TAU

The SpaceOAR is an injectable, biodegradable spacing device that separates the wall of the rectum from the prostate gland in men undergoing radiotherapy for prostate cancer. The hydrogel remains in place throughout radiation treatment and is slowly absorbed by the body afterwards. The device is intended to reduce the risk of damage to adjacent rectal tissue caused by radiation exposure.

MammaTyper In Vitro Diagnostic Test for Determining Breast Cancer Subtypes

NICE

The MammaTyper is a molecular diagnostic test used to identify subtypes of breast cancer. It is used to guide the treatment of early-stage breast cancers and may allow some patients to avoid post-surgery chemotherapy. MammaTyper is intended to replace standard immunohistochemistry testing, as it is easier to perform and can identify more tumour subtypes than standard testing.

Next-Generation Sequencing Panel for Solid Tumour Cancers in Children

NICE

This test is an in-house (not commercially available) laboratory test, developed at the UK Centre for Molecular Pathology. It can detect genetic mutations in certain types of childhood cancers. It may be used in addition to standard testing or as a replacement for less comprehensive genetic tests, and may also aid as a companion diagnostic for developing new biological treatments and targeted therapies for childhood cancers.

Outpatient Biopsy for Diagnosis of Suspicious Lesions of the Larynx, Pharynx, and Tongue Base

SHTG

An outpatient biopsy for head and neck cancers involves obtaining a tissue sample using a tiny forceps incorporated within a laryngoscope to allow visualization of the larynx and throat. The procedure is performed using a local anesthetic and is an alternative to a biopsy performed with the patient under general anesthesia in an operating room. An outpatient biopsy may allow some patients to receive a more timely diagnosis and to start treatment sooner. As well as reducing delays, it may reduce overall costs associated with biopsies performed in an operating theatre.

Plasma EGFR Mutation Tests for Adults With Locally Advanced or Metastatic Non–Small Cell Lung Cancer

NICE

This brief describes the evidence on seven plasma epidermal growth factor receptor (EGFR) mutation tests, which measure circulating tumour DNA in the blood. This may offer an alternative to a tissue biopsy. These tests are used to identify patients with non–small cell lung cancer who could benefit from treatment with EGFR tyrosine kinase inhibitors. The number of tissue biopsies performed could potentially be reduced by using these tests.

Robot Assisted Laparoscopic Partial Nephrectomy in Patients With T1a or T1b Renal Cancer

SHTG

Partial kidney removal is intended to preserve kidney function after cancer treatment. One of the more recent uses for the da Vinci robotic Surgical System is in the partial surgical removal of the kidney to treat early-stage localized tumours. Long-term outcomes are not yet known, but, in the short-term, robot-assisted surgery may reduce post-operative adverse events, blood loss, and length of hospital stay compared with open partial nephrectomy.

Robot-Assisted Surgery Compared With Laparoscopic Resection for the Treatment of Rectal Cancer

SHTG

Use of the da Vinci robotic Surgical System for the removal of rectal tumours is an alternative to laparoscopic (“keyhole”) surgical resection. It is not yet clear whether robotic surgery reduces adverse events following surgery, such as incontinence or sexual dysfunction. For some patients, robot-assisted surgery may reduce the risk of the procedure proceeding to open surgery.

Transoral Robotic Surgery (TORS) for the Diagnosis of Head and Neck Cancer of Unknown Primary

SHTG

One possible expanded indication for robotic surgery using the *da Vinci* robotic Surgical System is to aid in obtaining tissue samples for biopsy in head and neck cancers of unknown primary origin. This method could be used as an alternative to the current “blind biopsy” procedures.

Transoral Robotic Surgery (TORS) for the Treatment of Oropharyngeal and Supraglottic Laryngeal Cancers

SHTG

One potential indication for TORS is in head and neck cancer surgery as a potentially less disfiguring and painful alternative to alternative modes of transoral surgery or open surgery.

Tumor Treating Fields (Optune)

HTAP

An update of the evidence on the wearable Optune system, which delivers alternating electric fields for cancer treatment. Most of the studies to date have focused on the use of Optune in patients with glioblastoma brain tumours. (See the CADTH entry on Alternating Electric Fields on page 6 for more information about the Optune system.)

Cardiovascular

Cerebrotech Visor for Detecting Stroke

NICE

The Cerebrotech Visor is a non-invasive, portable monitoring device designed to detect differences in bioimpedance — how well the body hinders electrical flow — between the two hemispheres of the brain in people who may have had an ischemic stroke. The device looks like a virtual reality headset. When placed on the head, it measures bioimpedance using a company-developed algorithm to determine if the stroke is severe or minor. The Cerebrotech Visor can be used in both pre-hospital and hospital settings where immediate access to CT is unavailable.

Complex Endovascular Aneurysm Repair in Patients With Juxta-Renal or Thoraco-Abdominal Aortic Aneurysm

SHTG

Complex endovascular aneurysm repair (EVAR) is a novel, minimally invasive treatment option for patients perceived to be at moderate or high risk of harms if they undergo open surgical repair. EVAR involves repairing the aneurysm from the inside by inserting a stent graft into the aorta via a catheter inserted in an incision in the groin. The purpose of this review was to evaluate the evidence for complex EVAR and to identify the appropriate approach for delivery of the procedure.

A Gene Expression Test to Assess the Likelihood of Obstructive Coronary Artery Disease

CADTH

Corus CAD is a blood test intended to help clinicians rule out the possibility of obstructive coronary artery disease (CAD) or to plan further testing in people with symptoms suggestive of stable CAD. Using DNA from a blood sample, clinicians are provided with test results that incorporate the age, sex, and expression of 23 genes associated with CAD.

Mechanical Thrombectomy Devices for Acute Ischaemic Stroke

NICE

Mechanical thrombectomy is a treatment designed to restore blood flow to the brain by inserting a device to grab or suction blood clots from a main cerebral artery in people who have had an ischemic stroke. It is intended as an additional or alternative treatment option for people who do not benefit from or cannot receive thrombolytic drug therapies to dissolve blood clots. This report includes 21 technologies (stent retrievers and aspiration catheters) for mechanical thrombectomy.

New Technologies for the Treatment of Peripheral Artery Disease

CADTH

Peripheral artery disease (PAD) is a narrowing or blockage of the blood supply to the limbs – typically to the legs and feet – caused by a buildup of plaque inside the arteries. This report highlights two new endovascular treatments for PAD: the Shockwave Medical Lithoplasty System and the Pantheris Lumivascular Atherectomy technology. The Lithoplasty System combines sound waves and a balloon catheter to break up hardened plaque deposits and then expand the artery. The Pantheris technology uses optical coherence tomography (an imaging technology that uses light to provide three-dimensional guidance) as an alternative to imaging with X-ray or fluoroscopic guidance.

QAngio XA 3D/QFR Imaging Software for Assessing Coronary Obstructions

NICE

QAngio XA 3D/QFR (quantitative flow ratio) is an imaging software system to non-invasively assess the quantitative flow rate to detect coronary artery blockage. It uses two X-ray images of the inside of the artery to produce a three-dimensional reconstruction of the artery. The innovative aspect is that insertion of a guide wire and vasodilator drugs are not needed, decreasing the risk for associated adverse events. It is intended for use by an interventional cardiologist for assessing people with recent onset chest pain or those undergoing coronary angiography.

Remote ECG Interpretation Consultancy Services for Cardiovascular Disease

NICE

ECG is a recording of the electrical activity of the heart. It is used to help diagnose cardiovascular conditions. ECG results must be interpreted by a trained clinician before making a diagnosis or referral for additional testing. This report describes six remote interpretation consultation services intended to replace the need for patient transfer to a hospital for ECG interpretation, with the potential to reduce patient travel and provide a more timely diagnosis.

Reveal LINQ Insertable Cardiac Monitor to Detect Atrial Fibrillation After Cryptogenic Stroke

NICE

The Reveal LINQ Insertable Cardiac Monitoring (ICM) System is a cardiac monitoring device — also known as a cardiac event recorder or implantable loop recorder — that is inserted under the skin of the chest to monitor people with symptoms suggestive of an irregular heart rhythm. The device uses a proprietary algorithm intended to reduce false-positive test results and can be inserted in outpatient settings.

Dermatology, Wounds, and Injuries

Coban 2 for Venous Leg Ulcers

NICE

The 3M Coban 2 Layer Compression System is a bandage compression therapy system for the treatment of venous leg ulcers. Its inner layer consists of polyurethane foam padding and its outer layer consists of elastic and short-stretch fibres to assist therapeutic compression. The system is intended to support healing by reducing chronic edema, wound size, and pain.

EpiFix for Chronic Wounds

NICE

EpiFix is an amniotic membrane allograft made of dehydrated human amnion/chorion membrane tissue. The tissue is harvested from donated amniotic membranes and sterilized to prevent the transmission of viruses. It is intended to treat chronic wounds such as diabetic foot ulcers and venous leg ulcers.

Juxta Range of Products (Juxtacures, Juxtalite, Juxtafit)

SHTG

The Juxta products are compression garments used for venous leg ulcers (with or without edema) and lymphedema. They are reusable wraparound bandages that allow for the measurement and monitoring of compression to promote safe and consistent compression practices.

A Noncultured Autologous Skin Cell Spray Graft for the Treatment of Burns

CADTH

The RECELL Autologous Cell Harvesting Device is indicated for the treatment of acute thermal burn wounds. The device uses a small sample of a patient's skin to create a regenerative epidermal treatment that is sprayed on the wound to promote healing.

PICO Negative Pressure Wound Therapy for Closed Surgical Incision Wounds

NICE

The PICO Single Use Negative Pressure Wound Therapy System is a single-use technology intended to promote the healing of closed surgical wounds by removing exudate (liquid produced by the body in response to tissue damage) and infectious materials. It is a pocket-sized device that consists of a pump that removes air and excessive fluid from the wound, and an adhesive dressing to protect the wound from bacteria.

Ear, Nose, and Throat

[TYM Smartphone Otoscope for Imaging and Videoing the External Ear Canal and Eardrum](#)

NICE

The TYM smartphone otoscope consists of five specula, a proprietary smartphone case, and an otoscope attachment that are used to image and video the external ear canal and eardrum. It is intended as an alternative to the conventional otoscope in patients requiring an ear examination, and allows images and videos to be captured and stored in the patient's medical record.

Endocrine, Nutrition, and Metabolic

[Flash glucose monitoring system for diabetes](#)

Flash glucose monitoring is an alternative to finger prick blood glucose testing with a blood glucose meter. It is intended for people with type 1 diabetes or those with type 2 diabetes who require insulin therapy. The flash glucose monitor is a small device applied to the upper arm with a sensor that inserts under the skin. The sensor transmits information to a smartphone or other device. The use of flash glucose monitoring may improve blood glucose control and have psychosocial benefits for both adults and children with diabetes. Several health technology assessment (HTA) agencies have recently conducted HTAs or produced other types of reports on flash glucose monitoring:

- [Continuous Glucose Monitoring \(CGM Real-Time\) and Flash Glucose Monitoring \(FGM\) as Personal, Standalone Systems in Patients With Diabetes Mellitus Treated With Insulin](#)
EUnetHTA
- [Flash Glucose Monitoring System for Diabetes](#)
CADTH
- [Freestyle Libre Flash Glucose Monitoring](#)
SHTG
- [FreeStyle Libre Flash Glucose Monitoring for the Management of Type 1 or Type 2 Diabetes](#)
HTW
- [Système Flash de Surveillance du Glucose \(FreeStyle Libre, Abbott\) \[in French, with English summary\]](#)
INESSS

[Mobile Applications for Self-Management of Diabetes](#)

AHRQ

As the use of personal mobile devices — such as smartphones — expands, health care providers and clinicians are increasingly turning to mobile health (mHealth) applications to help manage complex conditions such as diabetes. Although there are hundreds of mHealth diabetes applications, this report found only 11 with evidence suitable for evaluation.

Eye and Vision

IDx-DR for Screening of Diabetic Retinopathy in Primary Health Clinic

MaHTAS

IDx-DR is a screening tool that uses artificial intelligence software to automate image screening for the detection of diabetic retinopathy to reduce the burden of manual screening by clinicians.

Noctura 400 Sleep Mask for Diabetic Retinopathy and Diabetic Macular Oedema

NICE

The Noctura 400 Sleep Mask emits blue-green light of a particular wavelength for the treatment of diabetic retinopathy and diabetic macular edema. The device delivers the light therapy to the back of the eyes and is intended to be worn at night for approximately eight hours while the patient sleeps.

ORA G3 to Measure Corneal Hysteresis

NICE

The Ocular Response Analyzer (ORA) G3 is a bidirectional tonometer — an instrument used for measuring internal eye pressure — intended to measure corneal hysteresis, a possible risk factor for glaucoma and glaucoma progression. The device does not require contact with the eye or the use of eye drops. It may be used in addition to standard tests to diagnose and manage glaucoma, such as the Goldmann applanation tonometry.

Genetic Testing and Gene Therapies

Gene Expression Profile Testing of Cancer Tissue

HTAP

Gene expression profile tests may help clinicians predict if cancers are slow-growing or likely to spread. This report reviews the evidence on the clinical utility and cost-effectiveness of a number of available and emerging gene expression profile tests for breast, prostate, and colon cancers, and for multiple myeloma.

Gene Therapy: An Overview of Approved and Pipeline Technologies

CADTH

Gene therapies, including gene editing (such as CRISPR) and chimeric antigen receptor T-cell therapy (CAR T-cell), have the potential to prevent, treat, or cure some types of cancers and rare genetic diseases. This report discusses gene therapies approved for use in the later stages of clinical development, as well as those in early clinical development with special designations for use.

Voretigene Neparvovec: An Emerging Gene Therapy for the Treatment of Inherited Blindness

CADTH

This gene therapy, under the brand name LUXTURN A, is a treatment for a form of inherited retinal dystrophy – Biallelic RPE65-mediated IRD – that results in severe visual impairment and eventual blindness early in life. The therapy replaces the faulty gene with a normally functioning gene to restore some vision. It is a one-time treatment administered to the retina using a viral vector. Each eye is treated separately.

What is Long-Read Sequencing? Long-Read Sequencing: Ready for the Clinic?

PHG Foundation

Two policy briefings have been prepared on long-read sequencing platforms such as PacBio (Pacific Biosciences) and Oxford Nanopore. These technologies allow longer strands of DNA to be analyzed more quickly than is possible with short-read sequencing (where DNA strands must be cut and analyzed in smaller batches) for genetic testing. Currently, long-read sequencing is mainly used in research settings, but it may offer clinical advantages, particularly for diagnosing rare diseases, some cancers, human leukocyte antigen typing for autoimmune disorders and organ or stem cell transplantation, and infectious disease genomics. It may also simplify laboratory workflows.

Infectious Disease and Infection Control

Curos Disinfecting Cap for Needleless Connectors

NICE

Some patients require vascular access devices for intravenous access and treatment delivery. Curos disinfecting caps are single-use devices filled with isopropyl alcohol. These twist onto vascular access devices to kill microorganisms and eliminate the need for manual disinfection of needleless connectors.

Point-of-Care Diagnostic Testing in Primary Care for *Strep A* Infection in Sore Throat

NICE

This briefing covers 11 technologies that can be used to diagnose group A streptococcal throat infections at the point of care. The tests include rapid antigen detection tests and nucleic acid amplification techniques that measure the presence of infection from throat swab samples. The tests have a fast turnaround time compared with laboratory culture and may guide initial antibiotic prescribing.

Rapid Antigen Detection Tests (RADTs) for Group A Streptococcal (GAS) Infection

SHTG

This report reviews various RADTs for group A streptococcal infections in people with acute sore throats. The tests require a throat swab and use different immunologic techniques to measure an antigen specific to the infection. RADTs aim to provide rapid results to help inform decisions around antibiotic therapy, particularly in primary care care settings.

Kidney and Urology

Axonics Sacral Neuromodulation System for Overactive Bladder and Faecal Incontinence

NICE

Sacral neuromodulation (SNM, also called sacral nerve stimulation) is the use of electrical pulses to stimulate the nerves of the pelvic floor and groin. By stimulating these nerves, communication between a person's bladder and bowel, and the brain, may be improved. The Axonics r-SNM System is an implantable, rechargeable SNM device intended to improve symptoms of fecal incontinence and overactive bladder in people for whom conservative management has been unsuccessful.

The Future for Diagnostic Tests of Acute Kidney Injury in Critical Care: Evidence Synthesis, Care Pathway Analysis and Research Prioritisation

NIHR

Acute kidney injury is common in hospitalized patients. The consequences of acute kidney injury include increased morbidity and mortality, reduced quality of life, and increased health care costs. This report evaluates the potential of emerging diagnostic tests and biomarkers to improve the care of patients with acute kidney injury in intensive care. A total of 152 potential tests and biomarkers were identified, and three tests – NephroCheck, NGAL, and cystatin C – were reviewed in detail.

Homechoice Claria With Sharesource

SHTG

Peritoneal dialysis is a method of removing waste products from the blood in people with chronic kidney disease. Sharesource is a software addition to an automated peritoneal dialysis system (HOMECHOICE CLARIA). The software uploads treatment information to the cloud, allowing health care providers to remotely monitor patients using the system.

Minimally Invasive Percutaneous Nephrolitholapaxy Medium (MIP-M) for Removing Kidney Stones

NICE

Percutaneous nephrolithotomy is a procedure used to remove kidney stones. It is intended to be an alternative to lithotripsy, ureteroscopy, and standard nephrolithotomy. The procedure is used for larger stones that do not pass naturally and where other methods of removal have been unsuccessful. MIP-M is a smaller version of standard percutaneous nephrolithotomy devices and includes a design feature that allows for irrigation to be used to aid stone retrieval. This may reduce procedure time, as well as morbidity and complications such as blood loss and infection.

NephroCheck Test to Help Assess the Risk of Acute Kidney Injury in Critically Ill Patients

NICE

NephroCheck is a urine test intended for the early detection of acute kidney injury, in addition to standard care. The test measures levels of tissue inhibitor of metalloproteinase 2 and insulin-like growth factor binding protein 7 – biomarkers that indicate kidney injury. Test results are presented as an acute kidney injury risk score 20 minutes after applying a urine sample mixed with labelling antibodies to a single-use test cartridge.

Point-of-Care Creatinine Tests Before Contrast-Enhanced Imaging

NICE

Contrast agents are regularly used in radiology; for example, in CT or MRI to improve diagnostic accuracy. But some contrast agents risk causing injury to the kidneys. It is important for clinicians to have a baseline measurement of kidney function before a patient undergoes contrast-enhanced imaging. This report describes seven hand-held or tabletop creatinine (a waste product indicative of kidney health) blood tests to assess kidney function. These tests are an alternative to laboratory testing.

Rezum for Treating Benign Prostatic Hyperplasia

NICE

Benign prostatic hyperplasia (BPH) is a common condition in older men that occurs when the prostate gland becomes enlarged, causing lower urinary tract symptoms. If lifestyle changes and drug therapies do not relieve symptoms, BPH may be treated with various minimally invasive procedures or with transurethral resection of the prostate to reduce the size of the prostate. Rezum is a less invasive procedure that uses steam, rather than surgical resection, to remove excess prostate tissue.

Mental Health

m-Health Applications for Responding to Drug Use and Associated Harms

EMCDDA

This report is a scoping review of mobile health (smartphone) applications (apps) for the management and treatment of drug misuse. It explores the global landscape and identified 67 mobile health apps available to both drug users and health professionals.

Nervous System and Neurology

Emerging Technologies for Pain Management

ISCRR

This report of emerging technologies for acute and chronic pain management includes two drugs, three neurostimulation devices using different frequencies and intensities of electrical pulses to stimulate specific nerves, and four pain management program models.

gammaCore for Cluster Headache

NICE

The gammaCore is a hand-held vagus nerve stimulator applied to the neck by the patient. The use of electrical stimulation is intended to modify pain signals. The device is for daily use as a preventive measure for people who experience cluster headaches, as well as when they experience the start of an episode, and is meant to be used in addition to standard treatments. Unlike other vagus nerve stimulators, the gammaCore is not implanted.

Harnessing Mobile Devices for Nervous System Disorders

National Academies of Sciences, Engineering, Medicine

This report includes summaries of presentations from a workshop that brought together key stakeholders to discuss the potential impact of mobile health on the detection, diagnosis, monitoring, and treatment of nervous system disorders. It includes a discussion of opportunities, ethical challenges, and regulatory considerations for the implementation of mobile health technologies.

New and Emerging Technologies in Neurophysiology and Operating Theatres

Sax Institute

Changes and developments in medical technology often result in the need for new skills and other workforce changes as they are implemented into the health care system. This report focuses on current, new, and emerging issues in science, technology, and procedures related to neurophysiology (assessment of the nervous system) and innovations in operating room technologies relevant to medical technicians.

Orthopedics

Galaxy UNYCO for Temporary Stabilisation of Lower Limb Fractures

NICE

The Galaxy UNYCO is a single-use device used for external fixation to stabilize complex fractures of the femur, tibia, ankle, and foot in both children and adults. The system is less invasive than existing reusable external fixation devices (i.e., it is not anchored as deeply as standard devices), possibly reducing the risk of bone infections and procedure time.

Palliative and Long-Term Care

[Airglove Air Warming System for Venous Access](#)

NICE

The Airglove system consists of a warming unit and single-use disposable gloves. It warms the veins in the arm to allow easier insertion of IV cannula. This might particularly benefit people with veins that are difficult to access, which amounts to about 20% of patients needing venous access, such as the frail elderly, those with diabetes, children, or cancer patients receiving chemotherapy. It may reduce patient pain and anxiety, save staff time spent making multiple attempts to get venous access, and may save on the number of disposables used in these multiple attempts.

Pediatrics

[Neon EEG Electrode for EEG Monitoring in Newborns](#)

NICE

The *Incereb* neon electroencephalogram (EEG) electrode is a single-use, adhesive, sensor array that can be placed on a newborn's scalp without requiring an EEG technician. It is intended for use in neonatal IV units to monitor and detect seizures in newborns who may have suffered perinatal brain injuries.

Respiratory

[myAIRVO2 for the Treatment of Chronic Obstructive Pulmonary Disease](#)

NICE

myAirvo 2 is a respiratory, gas delivery device that delivers nasal high-flow oxygen therapy in the home or community setting to people living with chronic obstructive pulmonary disease. The system includes a humidifier to warm and humidify respiratory gases to minimize damage to the upper airway. It also allows clinicians to titrate flow and oxygen levels separately. It is intended for use by people who are able to breathe without help and can also be used by people who have had a tracheostomy.

[OxyMask for Delivering Oxygen Therapy](#)

NICE

OxyMask is an oxygen therapy delivery mask with an open design that allows room air to mix with the oxygen as it is delivered. This may minimize carbon dioxide rebreathing while allowing the users to eat, drink, and communicate as they are receiving therapy. The device delivers oxygen at a wider range of flow rates and concentrations than other masks. Masks are available for both children and adults.

Servo-n With Neurally Adjusted Ventilatory Assist (NAVA) for Babies and Children

NICE

SERVO-n Neonatal Ventilator is a life-support system designed to provide mechanical ventilation in newborns, infants, and children weighing up to 30 kg. Unlike other mechanical ventilation systems, SERVO-n uses sensors to detect the electrical activity of the patient's diaphragm muscle. The electrical signals are interpreted by proprietary software to optimize the timing of and assistance provided by the ventilator in order to work in tandem with natural respiration.

The Vest for Delivering High-Frequency Chest Wall Oscillation in People With Complex Neurological Needs

NICE

People living with cystic fibrosis or other complex neurological conditions often have difficulty clearing their lungs of mucus. This can damage the airway and cause chronic infections. The Vest uses rapid pulses of air to compress and release the chest wall of the wearer, helping to move mucus from small branches of the lungs into larger passages where it can be suctioned or coughed up. The system is intended for use as an alternative to chest wall percussion, a manual technique used by respiratory physiotherapists and trained caregivers to help clear the airway.

VIDA|vision for Lung Volume Analysis in Emphysema

NICE

VIDA|vision is an imaging software suite that provides quantitative lung volume analysis and is compatible with a variety of CT scanners. The system can be used for a variety of analyses, but this briefing focuses on its use in planning lung volume reduction surgery. The software provides 3-D visualization of the airway and clinicians receive a customized patient report from the company to help determine if their patient is a suitable candidate for the surgery.

Video Laryngoscopes to Help Intubation in People With Difficult Airways

NICE

Intubation involves inserting a tube into the trachea (windpipe) to maintain an open airway in people under anesthesia, those requiring mechanical ventilation, or those with an injury that is blocking the airway. To correctly place the tube, clinicians use a device called a laryngoscope to help move the tongue out of the way and see the vocal chords. In some patients, it is challenging to see the vocal cords and correctly place the tube. Video laryngoscopes include a camera and video monitor that may help clinicians visualize difficult airways. This report discusses 11 video laryngoscopes.

Other

Accelerated Access Collaborative Rapid Uptake Products

NICE

This is a summary of technologies selected for the NICE Accelerated Access Collaborative (AAC). The seven innovative technologies on the initial UK list are:

- HeartFlow Analysis for estimating fractional flow reserve from coronary CT angiography
- placental growth factor (PIGF)-based testing for suspected preeclampsia
- PCSK9 inhibitors for the treatment of primary hypercholesterolemia and mixed dyslipidemia
- high-sensitivity troponin tests for early rule out of myocardial infarction
- quantitative fecal immunochemical tests for colorectal cancer
- cladribine for treating highly active relapsing-remitting multiple sclerosis in adults
- UroLift for lower urinary tract symptoms of benign prostatic hyperplasia.

An Overview of Clinical Applications of Artificial Intelligence

CADTH

This bulletin looks at the state of artificial intelligence in health care in Canada, including technologies in development, regulatory considerations, decision transparency, privacy; and social, ethical, and implementation issues and costs.

Developments in Surgical Practice

ASERNIP-S

Monthly reviews of published literature and clinical trials registry listings to identify and summarize developments in different surgical specialties.

Facing the Dynamics of Future Innovation: The Role of HTA, Industry and Health System in Scanning the Horizon

HTAi

An HTAi Global Policy Forum paper presents an overview of the current policy context and some key issues related to horizon scanning (early awareness and alert) systems in health technology assessment. Horizon scanning is intended to identify innovative or potentially disruptive technologies to allow decision-makers time to plan for their assessment and adoption.

Horizon Scanning, Topic Identification, Selection and Prioritisation for European Cooperation on HTA – Draft Recommendations

EUnetHTA

Draft recommendations that outline a process for horizon scanning and collaborative identification, selection, and prioritization of new, emerging, and obsolete health technologies within the European Network for HTA.

[My Healthy Future: The Technologies](#)

PHG Foundation

A summary of trends in the field of personalized medicine, including the “omics” technologies (genomics, proteomics, metabolomics, and epigenomics), mobile and digital health, and artificial intelligence.

[The Personalised Medicine Technology Landscape](#)

PHG Foundation

An overview of genomics and other “omics” technologies, including liquid biopsy and new health technologies that will enhance personalization of treatments. These include wearables, digital health, artificial intelligence, 3-D printing, robotics, and gene and stem cell therapies.

Trends and Forecasts

[Digital Health Best Practices for Policy Makers](#)

The Medical Futurist

A discussion of the types of challenges for health systems posed by digital health technologies and the increasing volume of patient health data.

[Healthcare Reimagined: Innovation Trends, Predictions and Actions for Healthcare Leaders](#)

KPMG

A look at anticipated changes in health care due to drivers such as personalized medicine, digital health, treatment innovations, hospital design, and “hybrid” workforces (such as artificial intelligence, medical robots, and drones).

[Horizon Scan of Medical Technologies: Technologies With an Expected Impact on the Organisation and Expenditure of Healthcare](#)

National Institute for Public Health and the Environment

This report from the Netherlands includes eHealth, the use of robots in care for the aged, 3-D printing in surgery, nanotechnology, personalized medicine, and artificial intelligence.

[ISPOR 2018 – Top 10 HEOR Trends](#)

ISPOR

In addition to trends in pharmaceutical health economics and outcomes research, this report includes mHealth, diagnostics, and preventive interventions, with a tenth category on disruptive innovations (gene editing [CRISPR] and CAR T-cell therapies).

[Medgadget’s Best Medical Technologies of 2018](#)

Medgadget

A look at what Medgadget authors consider to be the most clinically important or innovative new technologies of the year. The selections include artificial intelligence, new drug delivery technologies, and technologies that allow MRI and ultrasound imaging of joint movement.

[2018 Top 10 Hospital C-Suite Watch List](#)

ECRI

ECRI Institute's annual list of important new technologies and developments in patient care. The 2018 list includes smartphone apps for treating opioid addiction, direct-to-consumer genetic testing, implementation of acuity-adaptable rooms (rather than step-down units) for patient care, implantable cardiac monitoring of atrial fibrillation, virtual reality to reduce pain and anxiety for children undergoing medical procedures, transcranial magnetic stimulation for Alzheimer disease, microneedles (touch-activated phlebotomy) for less painful blood draws, a point-of-care MRI for newborns, brachytherapy seed implants for brain tumours, and micro-hospitals to meet short-term, non-emergency, community health needs.

[Top 10 Medical Innovations for 2019](#)

Cleveland Clinic

The latest annual list of medical innovations includes opioid alternatives for pain, artificial intelligence, new interventions for stroke, immunotherapy for cancer, 3-D printing, virtual reality, innovations in robotic surgery, transcatheter mitral and tricuspid valve replacement, and new ribonucleic acid (RNA)-based therapies.

[WHO Compendium of Innovative Health Technologies for Low-Resource Settings, 2016-2017](#)

WHO

This edition includes 29 commercial and 39 prototypical products that may be useful for health care in low-resource settings. Included in the compendium are medical devices, diagnostics, eHealth and mobile health technologies, personal protective equipment, and assistive devices.

Horizon Scanning Newsletters

[CADTH: Health Technology Update – Issue 22, October 2018 \(Artificial Intelligence Issue\)](#)

In this issue:

- IDx-DR: Automated Screening for Diabetic Retinopathy
- Chatbots: AI-Based Delivery of Therapy or Coaching for Mental Health Conditions
- Using Artificial Intelligence for Stroke in the Emergency Setting
- Detection of Cognitive Impairment and Dementia With Artificial Intelligence
- Focus On: Artificial Intelligence in Population and Public Health

CADTH: Health Technology Update – Issue 21, August 2018 (Rural and Remote Issue)

In this issue:

- Intelligent Retinal Imaging Systems for the Telescreening of Diabetic Retinopathy
- MELODY: A Teleoperated Robotic Ultrasound System
- Video Directly Observed Therapy of Tuberculosis Treatment
- A Rapid Point-of-Care Test to Differentiate Bacterial From Viral Acute Upper Respiratory Infections
- Focus On: Drone Applications in Health Care

CADTH: Health Technology Update – Issue 20, June 2018

In this issue:

- Contained Power Morcellation for the Removal of Uterine Fibroids
- Localized Thermal Therapy for Fibromyalgia
- Nature-Assisted Therapy for Post-Traumatic Stress Disorder
- Prostatic Artery Embolization for Benign Prostatic Hyperplasia
- Focus On: New Devices to Diagnose and Treat Obstructive Sleep Apnea

ISCR: Horizon Scanning Newsletter – Issue 6, January 2018

In this issue:

- Uro-Vaxom for Recurring Urinary Tract Infection in Individuals With Spinal Cord Injury
- Comfier Sleep System for People With Limited Mobility or Complex Care Needs
- A New Model of Care to Meet the Lifetime Needs of Individuals Following Spinal Cord Injury
- DenerveX System to Treat Back Pain Associated With Spinal Osteoarthritis
- A New Generation Prosthetic Hand That Allows the Wearer to Reach for Objects Automatically
- A New Test to Guide Choice of Antidepressant Therapy
- Communication-Specific Coping Intervention (CommCope-1) for Traumatic Brain Injury
- Outpatient (Same Day) Hip Replacement for Individuals With Osteoarthritis

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