

Tom Kelsey

📞 (+44) 7840 590 024 • ✉ twk@st-andrews.ac.uk
🌐 tom.host.cs.st-andrews.ac.uk • orcid.org/0000-0002-8091-1458

Education & Qualifications

- 2000 – PhD in Computer Science, University of St Andrews
- 1995 – MSc in Numerical Analysis & Programming, University of Dundee
- 1994 – BSc in Mathematics, Heriot Watt University

Appointments

- **School of Computer Science, University of St Andrews**
 - August 2019 – Present Professor of Health Data Science
 - August 2017 – July 2019 Reader in Health Data Science
 - August 2013 – July 2017 Senior Lecturer
 - September 2010 – July 2013 Lecturer
 - September 2003 – August 2010 Senior Research Fellow
 - November 1999 – August 2003 Research Fellow

Scholarly Activities

REF 2021

7 peer-reviewed and published papers currently proposed as outputs:

1. The impact of cancer on subsequent chance of pregnancy: a population-based analysis; Jul 2018; **Human Reproduction** 33(7)
2. Fertility preservation for girls and young women with cancer: Population-based validation of criteria for ovarian tissue cryopreservation; Sep 2014; **The Lancet Oncology** 15(10)
3. Non-growing follicle density is increased following adriamycin, bleomycin, vinblastine and dacarbazine (ABVD) chemotherapy in the adult human ovary; Jan 2017; **Human Reproduction** 32(1)
4. Accuracy of circulating adiponectin for predicting gestational diabetes: a systematic review and meta-analysis; Apr 2016; **Diabetologia** 59(4)
5. A validated age-related normative model for male total testosterone shows increasing variance but no decline after age 40 years; Oct 2014; **PLoS One** 9 e109346
6. Cancer treatment and gonadal function: experimental and established strategies for fertility preservation in children and young adults; Jul 2015; **The Lancet Diabetes & Endocrinology** 3(7)
7. Perinatal complications in female survivors of cancer: a systematic review and meta-analysis; April 2019; **European Journal of Cancer** 111, 126–137

REF 2014 & RAE 2007

Research outputs, together with number of citations since publication:

1. Human ovarian reserve from conception to the menopause; 2010; PLoS One. 5, e8772; **494 citations**
2. A validated model of serum anti-Müllerian hormone from conception to menopause; 2011; PLoS One. 6, e22024; **357 citations**
3. Which follicles make the most anti-Müllerian hormone in humans?: Evidence for an abrupt decline in AMH production at the time of follicle selection; 2013; Molecular Human Rep. 19(8); **244 citations**

4. Can Anti-Müllerian hormone predict the diagnosis of polycystic ovary syndrome?: A systematic review and meta-analysis of extracted data; 2013; J Clinical Endocrinology & Metabolism 98(8); **223 citations**
5. Tractable symmetry breaking using restricted search trees; 2004; Proceedings of the 16th European Conference on Artificial Intelligence; **88 citations**
6. The radiosensitivity of the human oocyte; 2003; Human Reproduction 18(1); **534 citations**
7. Predicting age of ovarian failure after radiation to a field that includes the ovaries; 2005; International Journal of Radiation Oncology Biology Physics. 62(3); **499 citations**
8. Ovarian reserve and reproductive age may be determined from measurement of ovarian volume by transvaginal sonography; 2004; Human Reproduction 19(7); **164 citations**

Awards

1. Detecting high-risk smokers in Primary Care Electronic Health Records: An automatic classification, data extraction and predictive modelling approach, The Melville Trust, **£120,000** 1/08/2019 – 31/07/2022
2. Reproductive function in young adult cancer patients in the UK, TYA CSG of the National Cancer Research Institute, **£150,000** 1/08/2019 – 28/02/23
3. SERUMS Project. EU Horizon2020 project 826278 (St Andrews Component of €4.5m award). PI K Hammond – **£800,000** 1/011/18 – 30/10/23
4. UK Institute for Health & Bioinformatics Research (St Andrews component of £37m award). PI: F Sullivan – MRC: **£450,000** 1/04/18 – 30/06/23
5. Development and feasibility of a communication training package for therapeutic radiographers to manage emotional talk with breast cancer patients in treatment. PI: G Humphris – Breast Cancer Now: **£88,168** 1/02/18 – 31/01/20
6. A Constraint Modelling Pipeline: A Constraint Modelling Pipeline. PI: I Miguel – EPSRC: **£886,923** 1/04/17 – 30/09/20
7. Pilot of the Mini-AFTERc intervention to manage fear of cancer recurrence. PI: G Humphris – CSO: **£249,495** 1/01/18 – 31/08/21
8. A Constraint Solver Synthesiser: A Constraint Solver Synthesiser. PI: I Miguel – EPSRC: **£929,076** 1/10/09 – 30/09/14
9. Fife Health and Social Care Partnership; MapMySmoke development; **£1,500**
10. NHS Fife R & D; Smart device applications for smoking cessation; **£20,000**
11. EPSRC Impact Acceleration Award; Medical and Healthcare mobile apps; **£16,808**

Collaborations & Contributions

- o Edinburgh Fertility – I work closely with Professors Anderson, Telfer and Wallace (resp. Reproductive Endocrinology, Reproductive Physiology and Paediatric Oncology) at the University of Edinburgh. We have a long established track record of publication in high-impact journals such as The Lancet Oncology, The Lancet Diabetes & Endocrinology, the European Journal of Cancer and Human Reproduction. My contribution is
 - the careful identification, aggregation, imputation and linkage of data suitable for studies into the late effects of cancer treatments on survivors of cancer
 - the use of modern AI machine learning techniques to derive and validate predictive models related to fertility in the healthy and treated populations
 - collaboration with colleagues at ISD and NSS to perform population-based analyses that compare fertility outcomes for cancer survivors with other members of the same community
 - critical evaluation of how our models and results relate to oncofertility research disseminated by groups in other countries
- o Copenhagen University Hospital – I provide non-clinical expertise to the group headed by Professor Anderson investigating cryopreservation of ovarian tissue as a fertility preservation technique for a range of conditions. We have an established track record of publication in high-impact journals such as Fertility & Sterility, Science of the Total Environment and Molecular Human Reproduction. My contribution is
 - the accurate prediction of attributes (that are unmeasurable *in vivo*) needed to quantify differences in

- the populations under investigation
 - the application of AI and statistical learning methods to quantify the certainty of results based on small samples
- Reproductive & Maternal Medicine, Glasgow – I work with Professor Nelson and Dr Iliodromiti at the University of Glasgow, investigating endocrine markers as diagnostic tools. We have an established track record of publication in high-impact journals such as the Journal of Clinical Endocrinology & Metabolism, Diabetologia and Molecular Human Reproduction Update. My contribution is
 - the use of hierarchical summary ROC analysis to accurately combine published diagnostic results into a single estimate
 - the careful combination of local data with summaries of published data to increase the power of investigations and provide enhanced clinical utility
- The Wolfson Fertility Centre – I am a regular visitor to the group headed by Professor Dhillo of Imperial College, London, working on individualised approaches to assisted conception, with recent publications in journals such as Clinical Endocrinology and Frontiers in Endocrinology. My contribution is
 - the adaptation of the tools and techniques I have developed for fertility after cancer to the wider problem of helping subfertile couples to have children
 - the careful combination of baseline, longitudinal and outcome IVF data from centres in London, Copenhagen and Vietnam
 - the use of modern AI knowledge discovery techniques to identify multivariate combinations of features that maximise chances of a live birth
 - advanced dose-response modelling using combinations of nonlinear regression, generalized (non)linear regression, and parametric survival analysis
- The University of St Andrews – I am an active researcher within
 - the Artificial Intelligence Research Group
 - the Population and Behavioural Science Division of the School of Medicine
 - the Digital Health Science Initiative
 - the St Andrews Institute for Data-Intensive Research
 - the Health Informatics Group within the School of Computer Science

Academic Organisation

- 2010 – 2017 Programme Committee Member, AAI Conference on Artificial Intelligence, International Joint Conference on Artificial Intelligence; Workshop on Knowledge Engineering, Discovery and Dissemination (IEEE International Conference on Bioinformatics & Biomedicine); International Conference on Artificial Intelligence and Symbolic Computation; Workshop on Combining Constraint solving with Mining and Learning.
- 2010 – 2015 St Andrews Representative, Scottish Informatics and Computer Science Alliance (SICSA), Modelling and Abstraction theme.

Peer Review Activities

- 2019 **Associate Editor** for Human Reproduction Update (Impact Factor 11.852).
- 2018 – 2019 **Associate Editor** for Frontiers in Physiology (Impact Factor 3.394).
- 2018 – 2019 **Associate Editor** for Frontiers in Endocrinology (Impact Factor 3.519).
- 2009 **Editor**: Symmetry and Search, Annals of Mathematics and Artificial Intelligence, 57(1).
- 2008 – 2015 **Research Council Reviewer**: EPSRC; BBSRC; Singapore A-star Joint Council Office.
- 2004– 2019 **Reviewer**: International Journal of Radiation Oncology Biology Physics, Nature Scientific Reports, British Medical Journal, AAI Conference on Artificial Intelligence, BMJ Open, Human Reproduction Update, Optimization Letters, Systems Biology in Reproductive Medicine; International Conference on Principles and Practice of Constraint Programming; Human Reproduction; International Conference on Artificial Intelligence and Symbolic Computation; Conference of the Association for the Advancement of Artificial Intelligence; Mathematical Medicine & Biology; International Joint Conference on Artificial Intelligence; Journal of Pediatric Endocrinology and Metabolism; The Computer Journal;

European Journal of Obstetrics & Gynecology and Reproductive Biology; Conference on Automated Deduction; International Conference on Logic for Programming, Artificial Intelligence, and Reasoning; Molecular Human Reproduction; Health Education Journal.

Engagement

Professional Bodies

- 2011 – 2019 Fellow, The Royal Society of Medicine
- 2011 – 2019 Member, The International Society for Fertility Preservation
- 2008 – 2011 Member, The Royal Society of Medicine

Steering Committees & Advisory Bodies

- 2011 – 2019 Board Member, Managed Services Network for Children and Young People with Cancer, NHS Scotland, also specialist advisor on Working Groups:
 - Operational Delivery – detailed oversight of neuro-oncology, palliative care, psychosocial care, pharmacy and Multidisciplinary Team organisation
 - MyStoryNow e-Passport App – pan-Scotland linkage of EHR, TRAK & scan data
 - Safety checklists – pan-Scotland linkage of TRAK data to improve patient safety and resource utilisation
 - Clinical Governance
- 2011 – 2014 External Assessor, eHealth Clinical Portal Benefits Realisation, NHS Scotland, South and East Boards.
- 2006 – 2011 Board Member, The Children and Teenagers Scottish Cancer Network, NHS Scotland Managed Clinical Network, also specialist advisor on Working Groups:
 - Multidisciplinary Team Communications
 - eHealth Strategy for Chemotherapy

Adjunct & Visiting Positions

- 2010 – 2019 Scientific Director, The Wallace-Kelsey Research Foundation
- 2017 – 2019 Visiting Professor, The Wolfson Fertility Centre at Hammersmith Hospital
- 2016 Visiting Professor, Laboratory of Reproductive Biology, Copenhagen University Hospital
- 2015 – 2016 Visiting Professor, Faculty of Medicine, Imperial College, London
- 2012 Visiting Professor, Universidade de Lisboa, Portugal
- 2008 – 2010 Visiting Professor, La Universidad de la República, Montevideo, Uruguay

Smart Device Applications

In order to promote knowledge transfer of AI research results in health data science, I design, implement, validate and release apps for Apple iOS and Google Android devices.

- MyStoryNow – ePassport for survivors of childhood cancer, containing scans & treatment history. NHS Public Benefit and Privacy Panel for Health approval in March 2019; Community Health Index Advisory Group approval in Feb 2019; Android app to be released later in 2019
- ivfPredict – calculation of individualised chances of a live birth after an IVF cycle. iOS and Android app released in 2012
- MyGraine – recording and visualisation of migraine-related symptoms & events. Android release 2015
- MapMySmoke – recording and logging craving and smoking events during quit attempts. iOS and Android versions currently being validated in conjunction with NHS Fife.
- Forecast2 & Mini-AFTERC – recording and logging fears of recurrence of breast cancer. iOS and Android versions being developed for validation in conjunction with NHS Lothian & NHS Tayside.
- Freya – visualisation and logging of ultrasound and endocrine tests that inform users about ovarian reserve and age at menopause. iOS and Android versions in pre-validation development.

Career Development

Specialist methodology support for fellowships

- MRC Experimental Challenges Fellowship – Ali Abbara of Imperial College London, project title “Individual Luteal-phase Support”, funded Jan 2019
- Senior Clinical Fellowship from the Chief Scientist Office – Rod Mitchell of the University of Edinburgh, project title “Protect, Preserve, Restore – Fertility Preservation in Prepubertal Boys with Cancer”, funded Nov 2018

Invited Talks

- Paediatric Visiting Club, North Berwick, September 2019
- 11th Advanced Paediatric Oncology Course, Edinburgh, May 2019
- Fear of reoccurrence of breast cancer smartphone apps demonstration, EPSRC Impact Festival, Glasgow, March 2019
- Computing AI and Machine Learning Live expert panel member for the launch event on the future of artificial intelligence and machine learning, London, November 2018
- EPSRC Impact Festival, Edinburgh, March 2018
- NHS Scotland MSN CYPC Mortality & Morbidity Event, November 2017
- 10th Advanced Paediatric Oncology Course, Edinburgh, May 2017
- Scottish Smoking Cessation Conference, November 2016
- Edinburgh Fertility Preservation, Edinburgh, June 2016
- Keynote invited speaker at the 4th Biennial World Congress of the International Society for Fertility Preservation held in Shanghai, PRC in November 2015
- 61st Annual Meeting of the Canadian Fertility and Andrology Society, Halifax, Nova Scotia, Canada in October 2015
- 9th Advanced Paediatric Oncology Course, Edinburgh, May 2015
- ADUP (App Data as a Utility for Public Health) Workshop, Glasgow, April 2015
- ISFP meeting on “Freezing of oocytes, embryos and ovarian tissue: focus on fertility management and fertility preservation”, held in Bruxelles, Belgium in January 2015
- European Symposium On Late Complications After Childhood Cancer, September 2014
- 8th Advanced Paediatric Oncology Course, Edinburgh, May 2013
- International Symposium on Fertility preservation: from endometriosis to ovarian tissue cryopreservation, Bruxelles, September 2012
- International Conference on Mathematical Modeling in Physical Sciences, Budapest, September 2012
- Workshop on Constraint Based Methods for Bioinformatics, Budapest, September 2012
- SICSA workshop on Biology and Computation, May 2012
- 15th International Conference on the Development and Function of Reproductive Organs, Edinburgh, September 2011
- Workshop on Eulerian and Lagrangian approaches towards quantitative prediction of premature labour, normal and dysfunctional full term labour, Edinburgh, August 2011
- International Conference on Computational Science, Singapore, June 2011
- 7th Advanced Paediatric Oncology Course, Edinburgh, May 2011
- SICSA workshop on Systems Medicine, Dundee, May 2011
- Workshop on Knowledge Engineering, Discovery and Dissemination, Hong Kong, September 2011
- University of Aberystwyth, April 2010
- University of Birmingham, December 2010
- Institut Pasteur - Montevideo, February 2010
- International Society for Computational Biology, Latin America meeting- Montevideo March 2010
- SBF/SBMN meeting on biological research image processing and visualisation in the context of modeling, Edinburgh, March 2009
- 36th Jornadas Argentinas de Informatica, Mar del Plata, Argentina, February 2008
- 11th International Conference on Principles and Practice of Constraint Programming, Sitges, Oct 2005
- 7th International Conference on Artificial Intelligence and Symbolic Computation, Linz, Sept 2004

Teaching

I support and practise the self-blended model of learning. In addition to traditional face-to-face lectures and tutorials, I provide online implementations of worked examples of the concepts, techniques and technologies being taught. This enables students to develop understanding and practical skills at their own pace, and in the setting of their choice. My aim is to augment traditional planned learning requiring physical collocation of students/tutees and lecturer/tutor, with less-structured learning that utilises internet and digital media technologies.

To this end, I have produced a suite of interactive web applications that enable students to visualise and experiment with important and complex concepts in datamining and knowledge discovery. The applications were designed for postgraduate students at St Andrews, but are also available to anyone with internet access. Examples include:

- tkelsey.shinyapps.io/shinyoverfit - interactive modelling of population data for an Italian city
- tkelsey.shinyapps.io/shinytreetuning - tuning parameters for letter recognition data
- tkelsey.shinyapps.io/shinymodelselect - model selection for simulated data
- tkelsey.shinyapps.io/shinyregression - model evaluation for simulated data
- tkelsey.shinyapps.io/sensspec - accuracy & precision of model predictions

Undergraduate & PGT

- 2019 Programme Co-director, MSc in Digital Health
- 2017 – 2018 Honours and MSci Coordinator, School of Computer Science
- 2015 – 2018 Programme Director, MSc in Data Intensive Analysis
- 2012 – 2017 Projects Coordinator, School of Computer Science
- 2012 – 2019 Module Developer, ID5059 Datamining & Knowledge Discovery
- 2018 Module Developer, CS5002 Programming Principles and Practice.
- 2010 – 2019 design and delivery of modules
 - Pre-honours: CS1005, CS1006, CS2001, CS2002, CS2003, CS2101
 - Honours: CS3302, CS3052, CS3302, CS4303, CS4052
 - MSc: CS5010, IS5101, CS5002, IS5102, ID5059
- 2010 – 2019 supervision of 86 single-student projects
 - 29 at CS4000-level
 - 38 at CS5000-level
 - 19 at IS5000-level

Postgraduate Research Supervision

- 4 current PhD students under supervision at St Andrews
- 7 PhD students previously supervised at St Andrews
- Co-supervision of a PhD with the Universitat Politècnica de València, Spain

Postgraduate Examination

- 2012 External Examiner, University of Dundee, Computer Science, PhD
- 2011 – 2019 Internal Examiner, University of St Andrews, Computer Science, PhD
- 2011 – 2019 Exam convener, University of St Andrews, Computer Science, PhD
- 2008 External Examiner, Queen Mary University of London, Computer Science, MPhil

Internships

I have funded and supervised 18 paid summer internship projects, giving students experience of collective working to satisfy managers and clients, in addition to their work towards a good degree. The primary aim is providing education and training in mobile app design, development and deployment.

Publications

3 manuscripts currently under review:

- In vitro potential of follicles/oocytes obtained from patients following long-term masculinizing hormone treatment; M McGlaughlin, Y L Clarkson, T W Kelsey, S Jack, N Watson, R A Anderson, E E Telfer; *Human Reproduction* (under review)
- Efficient identification of patients eligible for clinical trials using case-based reasoning and the Scottish Health Research Register (SHARE); W Shi, T W Kelsey, F Sullivan; *BMC Medical Informatics and Decision Making* (under review)
- Within-host modelling of tuberculosis: can calculus cure consumption? M Pitcher, R Bowness, S Dobson, T W Kelsey, S Gillespie; *Antimicrobial Agents and Chemotherapy* (under review)

80 peer-reviewed publications – 17 as first author; 30 as second author; 14 as last author.

h-index: 32 • i10-index: 60 • Citations in 2019 to date: 620 • Total citations: 5,374

Ali Abbara, Aaran Hitesh Patel, Tia Hunjan, Sophie Clarke, Germaine Chia, Pei Chia Eng, Maria Phylactou, Alexander Comminos, Stuart Lavery, Geoffrey Trew, et al. FSH requirements for follicle growth during controlled ovarian stimulation. *Frontiers in Endocrinology*, 10:579, 2019a.

Ali Abbara, Pei Chia Eng, Maria Phylactou, Sophie A Clarke, Hunjan Tia, Rachel Roberts, Sunitha Vimalasvaran, George Christopoulos, Rumana Islam, Kate Purugganan, et al. Anti-müllerian hormone (AMH) in the diagnosis of menstrual disturbance due to polycystic ovarian syndrome. *Frontiers in Endocrinology*, 10:656, 2019b.

Mara van Beusekom, Josie Cameron, Carolyn Bedi, Elspeth Banks, Tom Kelsey, and Gerry Humphris. Development, acceptability and feasibility of a communication skills training package for therapeutic radiographers to reduce fear of recurrence development in breast cancer patients (FORECAST2). *Pilot and feasibility studies*, 4(1):148, 2018a.

Tom Kelsey, Chia-Ho Hua, and W. Hamish B. Wallace. The effect of radiotherapy on the human reproductive system. In Samuel Kim and Jacques Donnez, editors, *Fertility Preservation: Principles & Practice (in press)*, chapter 2. Cambridge University Press, 2nd edition, 2019.

Andrea Rosales, Tom Kelsey, and Juan Ye. Representation learning for minority and subtle activities in a smart home environment. In *Proceedings of the IEEE International Conference on Pervasive Computing and Communications, PERCOM19*. IEEE, 2019.

A. L. F. van der Kooi, T. W. Kelsey, M. M. van den Heuvel-Eibrink, J. S. E. Laven, W. H. B. Wallace, and R. A. Anderson. Perinatal complications in female survivors of cancer: a systematic review and meta-analysis. *European Journal of Cancer*, 111:126–137, Apr 2019.

L. S. Mamsen, K. Charkiewicz, R. A. Anderson, E. E. Telfer, M. McLaughlin, T. W. Kelsey, S. G. Kristensen, D. A. Gook, E. Ernst, and C. Y. Andersen. Characterization of follicles in girls and young women with Turner syndrome who underwent ovarian tissue cryopreservation. *Fertility & Sterility*, Mar 2019.

T Hunjan, A Abbara, A Patel, S Clarke, G Chia, PC Eng, M Phylactou, A Comminos, S Lavery, G Trew, et al. Fsh requirements for follicle growth during controlled ovarian stimulation in ivf cycles. In *BJOG*, volume 126, pages 193–194. Wiley, 2019.

M. van Beusekom, J. Cameron, C. Bedi, E. Banks, T. W. Kelsey, and G. Humphris. Development, acceptability and feasibility of a communication skills training package for therapeutic radiographers

- to reduce fear of recurrence development in breast cancer patients (FORECAST2). *Pilot & Feasibility Studies*, 4:148, 2018b.
- R. A. Anderson, D. H. Brewster, R. Wood, S. Nowell, C. Fischbacher, T. W. Kelsey, and W. H. B. Wallace. The impact of cancer on subsequent chance of pregnancy: a population-based analysis. *Human Reproduction*, 33(7):1281–1290, Jul 2018.
- L. S. Mamsen, T. W. Kelsey, E. Ernst, K. T. Macklon, A. M. Lund, and C. Y. Andersen. Cryopreservation of ovarian tissue may be considered in young girls with galactosemia. *Journal of Assisted Reproduction & Genetics*, May 2018.
- A. Abbara, L. N. Vuong, V. N. A. Ho, S. A. Clarke, L. Jeffers, A. N. Comninou, R. Salim, T. M. Ho, T. W. Kelsey, G. H. Trew, P. Humaidan, and W. S. Dhillo. Follicle Size on Day of Trigger Most Likely to Yield a Mature Oocyte. *Frontiers in Endocrinology*, 9:193, 2018a.
- A. Abbara, R. Islam, S. A. Clarke, L. Jeffers, G. Christopoulos, A. N. Comninou, R. Salim, S. A. Lavery, T. N. L. Vuong, P. Humaidan, T. W. Kelsey, G. H. Trew, and W. S. Dhillo. Clinical parameters of ovarian hyperstimulation syndrome following different hormonal triggers of oocyte maturation in IVF treatment. *Clinical Endocrinology*, 88(6):920–927, Jun 2018b.
- T. W. Kelsey, L. McConville, A. B. Edgar, A. I. Ungurianu, R. T. Mitchell, R. A. Anderson, and W. H. B. Wallace. Follicle Stimulating Hormone is an accurate predictor of azoospermia in childhood cancer survivors. *PLoS ONE*, 12(7):e0181377, 2017.
- R. S. Schick, T. W. Kelsey, J. Marston, K. Samson, and G. W. Humphris. MapMySmoke: feasibility of a new quit cigarette smoking mobile phone application using integrated geo-positioning technology, and motivational messaging within a primary care setting. *Pilot & Feasibility Studies*, 4:19, 2018.
- L. S. Mamsen, B. A. G. Jonsson, C. H. Lindh, R. H. Olesen, A. Larsen, E. Ernst, T. W. Kelsey, and C. Y. Andersen. Concentration of perfluorinated compounds and cotinine in human foetal organs, placenta, and maternal plasma. *Science of the Total Environment*, 596-597:97–105, Oct 2017.
- M. McLaughlin, T. W. Kelsey, W. H. Wallace, R. A. Anderson, and E. E. Telfer. Non-growing follicle density is increased following adriamycin, bleomycin, vinblastine and dacarbazine (ABVD) chemotherapy in the adult human ovary. *Human Reproduction*, 32(1):165–174, 01 2017.
- M. El Issaoui, V. Giorgione, L. S. Mamsen, C. Rechnitzer, N. Birkebaek, N. Clausen, T. W. Kelsey, and C. Y. Andersen. Effect of first line cancer treatment on the ovarian reserve and follicular density in girls under the age of 18 years. *Fertility & Sterility*, 106(7):1757–1762, Dec 2016.
- C. Y. Andersen, R. Fischer, V. Giorgione, and T. W. Kelsey. Micro-dose hCG as luteal phase support without exogenous progesterone administration: mathematical modelling of the hCG concentration in circulation and initial clinical experience. *Journal of Assisted Reproduction & Genetics*, 33(10): 1311–1318, Oct 2016.
- T. W. Kelsey, E. Ginbey, M. M. Chowdhury, L. E. Bath, R. A. Anderson, and W. H. Wallace. A Validated Normative Model for Human Uterine Volume from Birth to Age 40 Years. *PLoS ONE*, 11(6):e0157375, 2016a.
- G. Humphris, J. Spyt, A. G. Herbison, and T. W. Kelsey. Adult Dental Anxiety: Recent Assessment Approaches and Psychological Management in a Dental Practice Setting. *Dental Update*, 43(4):388–389, May 2016.

- K. A. Phillips, I. M. Collins, R. L. Milne, S. A. McLachlan, M. Friedlander, M. Hickey, C. Stern, J. L. Hopper, R. Fisher, G. Kannemeyer, S. Picken, C. D. Smith, T. W. Kelsey, and R. A. Anderson. Anti-Müllerian hormone serum concentrations of women with germline BRCA1 or BRCA2 mutations. *Human Reproduction*, 31(5):1126–1132, May 2016.
- T. W. Kelsey, A. Miles, R. T. Mitchell, R. A. Anderson, and W. H. Wallace. A Normative Model of Serum Inhibin B in Young Males. *PLoS ONE*, 11(4):e0153843, 2016b.
- S. Iliodromiti, J. Sassarini, T. W. Kelsey, R. S. Lindsay, N. Sattar, and S. M. Nelson. Accuracy of circulating adiponectin for predicting gestational diabetes: a systematic review and meta-analysis. *Diabetologia*, 59(4):692–699, Apr 2016.
- W. H. Wallace, T. W. Kelsey, and R. A. Anderson. Fertility preservation in pre-pubertal girls with cancer: the role of ovarian tissue cryopreservation. *Fertility & Sterility*, 105(1):6–12, Jan 2016.
- M. McLaughlin, T. W. Kelsey, W. H. Wallace, R. A. Anderson, and E. E. Telfer. An externally validated age-related model of mean follicle density in the cortex of the human ovary. *Journal of Assisted Reproduction & Genetics*, 32(7):1089–1095, Jul 2015.
- M. Depmann, M. J. Faddy, Y. T. van der Schouw, P. H. Peeters, S. L. Broer, T. W. Kelsey, S. M. Nelson, and F. J. Broekmans. The Relationship Between Variation in Size of the Primordial Follicle Pool and Age at Natural Menopause. *Journal of Clinical Endocrinology & Metabolism*, 100(6):E845–851, Jun 2015.
- R. A. Anderson, R. T. Mitchell, T. W. Kelsey, N. Spears, E. E. Telfer, and W. H. Wallace. Cancer treatment and gonadal function: experimental and established strategies for fertility preservation in children and young adults. *The Lancet Diabetes & Endocrinology*, 3(7):556–567, Jul 2015.
- T. W. Kelsey, L. Q. Li, R. T. Mitchell, A. Whelan, R. A. Anderson, and W. H. Wallace. A validated age-related normative model for male total testosterone shows increasing variance but no decline after age 40 years. *PLoS ONE*, 9(10):e109346, 2014a.
- W. H. Wallace, A. G. Smith, T. W. Kelsey, A. E. Edgar, and R. A. Anderson. Fertility preservation for girls and young women with cancer: population-based validation of criteria for ovarian tissue cryopreservation. *The Lancet Oncology*, 15(10):1129–1136, Sep 2014.
- S. Iliodromiti, T. W. Kelsey, O. Wu, R. A. Anderson, and S. M. Nelson. The predictive accuracy of anti-Müllerian hormone for live birth after assisted conception: a systematic review and meta-analysis of the literature. *Human Reproduction Update*, 20(4):560–570, 2014.
- D. Dewailly, C. Y. Andersen, A. Balen, F. Broekmans, N. Dilaver, R. Fanchin, G. Griesinger, T. W. Kelsey, A. La Marca, C. Lambalk, H. Mason, S. M. Nelson, J. A. Visser, W. H. Wallace, and R. A. Anderson. The physiology and clinical utility of anti-Müllerian hormone in women. *Human Reproduction Update*, 20(3):370–385, 2014.
- T. W. Kelsey, S. K. Dodwell, A. G. Wilkinson, T. Greve, C. Y. Andersen, R. A. Anderson, and W. H. Wallace. Ovarian volume throughout life: a validated normative model. *PLoS ONE*, 8(9):e71465, 2013.
- R. A. Anderson, M. Rosendahl, T. W. Kelsey, and D. A. Cameron. Pretreatment anti-Müllerian hormone predicts for loss of ovarian function after chemotherapy for early breast cancer. *European Journal of Cancer*, 49(16):3404–3411, Nov 2013.
- S. Iliodromiti, T. W. Kelsey, R. A. Anderson, and S. M. Nelson. Can anti-Müllerian hormone predict the diagnosis of polycystic ovary syndrome? A systematic review and meta-analysis of extracted data. *Journal of Clinical Endocrinology & Metabolism*, 98(8):3332–3340, Aug 2013.

- J. V. Jeppesen, R. A. Anderson, T. W. Kelsey, S. L. Christiansen, S. G. Kristensen, K. Jayaprakasan, N. Raine-Fenning, B. K. Campbell, and C. Yding Andersen. Which follicles make the most anti-Müllerian hormone in humans? Evidence for an abrupt decline in AMH production at the time of follicle selection. *Molecular Human Reproduction*, 19(8):519–527, Aug 2013.
- R. Fleming, T. W. Kelsey, R. A. Anderson, W. H. Wallace, and S. M. Nelson. Interpreting human follicular recruitment and antimüllerian hormone concentrations throughout life. *Fertility & Sterility*, 98(5): 1097–1102, Nov 2012.
- W. H. Wallace, T. W. Kelsey, and R. A. Anderson. Ovarian cryopreservation: experimental or established and a cure for the menopause? *Reproductive Biomedicine Online*, 25(2):93–95, Aug 2012.
- T. W. Kelsey and W. H. Wallace. Ovarian volume correlates strongly with the number of nongrowing follicles in the human ovary. *Obstetrics & Gynecology International*, 2012:305025, 2012.
- T. W. Kelsey, R. A. Anderson, P. Wright, S. M. Nelson, and W. H. Wallace. Data-driven assessment of the human ovarian reserve. *Molecular Human Reproduction*, 18(2):79–87, Feb 2012.
- T. W. Kelsey, P. Wright, S. M. Nelson, R. A. Anderson, and W. H. Wallace. A validated model of serum anti-müllerian hormone from conception to menopause. *PLoS ONE*, 6(7):e22024, 2011.
- W. H. Wallace and T. W. Kelsey. Human ovarian reserve from conception to the menopause. *PLoS ONE*, 5(1):e8772, Jan 2010.
- S. Brett, N. Bee, W. H. Wallace, M. Rajkhowa, and T. W. Kelsey. Individual ovarian volumes obtained from 2-dimensional and 3-dimensional ultrasound lack precision. *Reproductive Biomedicine Online*, 18 (3):348–351, Mar 2009.
- W. H. Wallace, A. B. Thomson, F. Saran, and T. W. Kelsey. Predicting age of ovarian failure after radiation to a field that includes the ovaries. *International Journal of Radiation Oncology Biology Physics*, 62(3):738–744, Jul 2005.
- W. H. Wallace and T. W. Kelsey. Ovarian reserve and reproductive age may be determined from measurement of ovarian volume by transvaginal sonography. *Human Reproduction*, 19(7):1612–1617, Jul 2004.
- W. H. Wallace, A. B. Thomson, and T. W. Kelsey. The radiosensitivity of the human oocyte. *Human Reproduction*, 18(1):117–121, Jan 2003.
- T. Kelsey, M. McCaffery, and L. Kotthoff. Web-scale distributed escience ai search across disconnected and heterogeneous infrastructures. In *Proceedings - 2014 IEEE 10th International Conference on eScience, eScience 2014*, volume 1, pages 39–46. IEEE, 12 2014b. ISBN 9781479942886. doi: 10.1109/eScience.2014.15.
- C Xiong, Tom Kelsey, Stephen Alexander Linton, and Ulf Leonhardt. Towards the calculation of casimir forces for inhomogeneous planar media. In Ruyong Feng, Wen shin Lee, and Yosuke Sato, editors, *Computer Mathematics*, pages 171–180. Springer, Netherlands, 10 2014. ISBN 978-3-662-43798-8. doi: 10.1007/978-3-662-43799-5_15.
- Tom Kelsey, Lars Kotthoff, C A Jefferson, S A Linton, I J Miguel, Peter Nightingale, and I P Gent. Qualitative modelling via constraint programming. *Constraints*, 19(2):163–173, 4 2014c. ISSN 1383-7133. doi: 10.1007/s10601-014-9158-6.
- Andreas Distler and Tom Kelsey. The semigroups of order 9 and their automorphism groups. *Semigroup Forum*, 88(1):93–112, 2 2014. ISSN 0037-1912. doi: 10.1007/s00233-013-9504-9.

- Chun Xiong, Tom Kelsey, Stephen Alexander Linton, and Ulf Leonhardt. *Casimir forces for inhomogeneous planar media*, volume 401 of *Journal of Physics: Conference Series*. IOP Publishing, 1 edition, 1 2013. doi: 10.1088/1742-6596/410/1/012165.
- A. Distler, C. Jefferson, T. Kelsey, and L. Kotthoff. The semigroups of order 10. *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 7514 LNCS:883–899, 2012.
- Tom Kelsey and Lars Kotthoff. Exact closest string as a constraint satisfaction problem. In *Proceedings of the International Conference on Computational Science, ICCS 2011*, volume 4, pages 1062–1071. Procedia Computer Science, 2011. doi: 10.1016/j.procs.2011.04.113.
- Elena Beratarbide and Tom Kelsey. *eHealth Governance, A Key Factor for Better Health Care: Implementation of IT Governance to Ensure Better Care through Better eHealth*, pages 72–92. Medical Information Science Reference, 2011. ISBN 9781609601744. doi: 10.4018/978-1-60960-174-4.ch006.
- C. Jefferson, T. Kelsey, S. Linton, and K. Petrie. Gaplex: Generalized static symmetry breaking. *Trends in Constraint Programming*, pages 187–201, 2010.
- T.W. Kelsey and W.H.B. Wallace. Machine science in biomedicine: Practicalities, pitfalls and potential. *2010 IEEE International Conference on Bioinformatics and Biomedicine Workshops, BIBMW 2010*, pages 399–404, 2010.
- T Kelsey, B Caserta, L Castillo, Wallace W H B, and González F C. Proliferating cell nuclear antigen (PCNA) allows the automatic identification of follicles in microscopic images of human ovarian tissue. *Pathology and Laboratory Medicine International*, 2010(2).
- T.W. Kelsey, R. Diego Burillo, and Olmos J.C. *Radioterapia y gonadotoxicidad femenina*. Editorial Glosa, 2009.
- A. Distler and T. Kelsey. The monoids of orders eight, nine and ten. *Annals of Mathematics and Artificial Intelligence*, 56(1):3–21, 2009.
- A. Distler and T. Kelsey. The monoids of order eight and nine. *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 5144 LNAI:61–76, 2008.
- I.P. Gent, T.W. Kelsey, S.A. Linton, J. Pearson, and C.M. Roney-Dougal. Groupoids and conditional symmetry. *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 4741 LNCS:823–830, 2007a.
- I.P. Gent, C. Jefferson, T. Kelsey, I. Lynce, I. Miguel, P. Nightingale, B.M. Smith, and S.A. Tarim. Search in the patience game 'Black Hole'. *AI Communications*, 20(3):211–226, 2007b.
- I P Gent, T W Kelsey, S A Linton, I McDonald, I Miguel, and B M Smith. Conditional symmetry breaking. In Peter Van Beek, editor, *Principles and practice of constraint programming—CP 2005: 11th international conference, CP 2005, Sitges, Spain, October 1-5, 2005 : Proceedings*, Lecture notes in computer science, pages 256–270, Netherlands, 10 2005a. Springer. ISBN 978-3-540-29238-8. doi: 10.1007/11564751_21.
- H Gottlieb, T Kelsey, and U Martin. Hidden verification for computational mathematics. *Journal of Symbolic Computation*, 39(5):539–567, 5 2005. ISSN 0747-7171. doi: 10.1016/j.jsc.2004.12.005.

- Ian P. Gent, Tom Kelsey, Steve Linton, and Colva Roney-Dougal. Symmetry and consistency. In *Principles and Practice of Constraint Programming - CP 2005*, pages 271–285. Springer Science, 2005b. doi: 10.1007/11564751_22. URL http://dx.doi.org/10.1007/11564751_22.
- C M Roney-Dougal, I P Gent, T W Kelsey, and S A Linton. Tractable symmetry breaking using restricted search trees. In *ECAI 2004: 16th European Conference on Artificial Intelligence, August 22-27, 2004, Valencia, Spain*, Frontiers in artificial intelligence and applications, pages 211–215, Netherlands, 8 2004. IOS Press. ISBN 1586034529.
- Richard J. Boulton, Hanne Gottliebsen, Ruth Hardy, Tom Kelsey, and Ursula Martin. Design verification for control engineering. In *Lecture Notes in Computer Science*, pages 21–35. Springer Science, 2004a. doi: 10.1007/978-3-540-24756-2_2. URL http://dx.doi.org/10.1007/978-3-540-24756-2_2.
- R.J. Boulton, H. Gottliebsen, R. Hardy, T. Kelsey, and U. Martin. Design verification for control engineering. *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 2999:21–35, 2004b.
- T. Kelsey, S. Linton, and C. Roney-Dougal. New developments in symmetry breaking in search using computational group theory. *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 3249:199–210, 2004a.
- Tom Kelsey, Steve Linton, and Colva Roney-Dougal. New developments in symmetry breaking in search using computational group theory. In *Artificial Intelligence and Symbolic Computation*, pages 199–210. Springer Science, 2004b. doi: 10.1007/978-3-540-30210-0_17. URL http://dx.doi.org/10.1007/978-3-540-30210-0_17.
- Ian Gent, W Harvey, Thomas Kelsey, and Stephen Linton. Generic SBDD using computational group theory. In Francesca Rossi, editor, *Principles and Practice of Constraint Programming – CP 2003*, Lecture Notes in Computer Science, pages 333–347, Netherlands, 10 2003a. Springer. ISBN 978-3-540-20202-8. doi: 10.1007/b13743.
- Ian P. Gent, Warwick Harvey, Tom Kelsey, and Steve Linton. Generic SBDD using computational group theory. In *Principles and Practice of Constraint Programming – CP 2003*, pages 333–347. Springer Science, 2003b. doi: 10.1007/978-3-540-45193-8_23. URL http://dx.doi.org/10.1007/978-3-540-45193-8_23.
- Ian P. Gent, Warwick Harvey, and Tom Kelsey. Groups and constraints: Symmetry breaking during search. In *Lecture Notes in Computer Science*, pages 415–430. Springer Science, 2002a. doi: 10.1007/3-540-46135-3_28. URL http://dx.doi.org/10.1007/3-540-46135-3_28.
- I.P. Gent, W. Harvey, and T. Kelsey. Groups and constraints: Symmetry breaking during search. *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 2470:415–430, 2002b.
- Andrew Adams, Martin Dunstan, Hanne Gottliebsen, Tom Kelsey, Ursula Martin, and Sam Owre. Computer algebra meets automated theorem proving: Integrating maple and PVS. In *Lecture Notes in Computer Science*, pages 27–42. Springer Science, 2001a. doi: 10.1007/3-540-44755-5_4. URL http://dx.doi.org/10.1007/3-540-44755-5_4.
- A. Adams, M. Dunstan, H. Gottliebsen, T. Kelsey, U. Martin, and S. Owre. Computer algebra meets automated theorem proving: Integrating maple and pvs. *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 2152:27–42, 2001b.

M.N. Dunstan, T. Kelsey, U. Martin, and S. Linton. Formal methods for extensions to cas. *Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, 1709:1758–1777, 1999a.

Martin N. Dunstan, Tom Kelsey, Ursula Martin, and Steve Linton. Formal methods for extensions to CAS. In *FM'99 – Formal Methods*, pages 1758–1777. Springer Science, 1999b. doi: 10.1007/3-540-48118-4_43. URL http://dx.doi.org/10.1007/3-540-48118-4_43.

Martin Dunstan, Tom Kelsey, Steve Linton, and Ursula Martin. Lightweight formal methods for computer algebra systems. In *Proceedings of the 1998 international symposium on Symbolic and algebraic computation - ISSAC 98*. Association for Computing Machinery (ACM), 1998a. doi: 10.1145/281508.281560. URL <http://dx.doi.org/10.1145/281508.281560>.

Martin Dunstan, Tom Kelsey, Steve Linton, and Ursula Martin. Lightweight formal methods for computer algebra systems. *Proceedings of the International Symposium on Symbolic and Algebraic Computation, ISSAC*, pages 80–87, 1998b.

December 2, 2019