CORONERS COURT OF QUEENSLAND

CITATION:	*Inquest into the death of Jeffrey Stewart Olsen*
FILE NO:	2020/4287
DIVISION:	Coroners Court
PROCEEDING:	Inquest
JURISDICTION:	Cairns
DELIVERED ON:	2 July 2026
DELIVERED AT:	Cairns
HEARING DATES:	25, 26, 27, 28, 29 November 2024
CORONER:	S. Williams
ORDERS:	

CATCHWORDS:	CORONERS –INQUEST – FINDINGS – COLORECTAL CANCER - COLONIC ADENOCARCINOMA - ADJUVANT CHEMOTHERAPY TREATMENT – ORAL FLUOROPYRIMIDINE - CAPECITABINE – CAPECITABINE TOXICITY –GENETIC VARIATION - ENZYME DEFICIENCY – GENETIC TESTING - URIDINE TRIACETATE – ANTIDOTE – ONCOLOGY
COUNSEL:	S Robb KC as counsel assisting C Eves for S Olsen S Lane for Cairns & Hinterland Hospital and Health Service A Hughes for Queensland Health
SOLICITORS:	Caxton Legal Centre for Susan Olsen Minter Ellison, for Cairns & Hinterland Hospital and Health Service

CONTENT WARNING

This document contains material that can be confronting and disturbing. Sometimes information (words and data) can cause sadness or distress, or traumatic memories for people. For some people, these responses can be overwhelming. Support is available if you need to talk to someone. A list of support services for family and friends can be found at https://www.coronerscourt.qld.gov.au/for-families/support-services-for-families-and-friends .

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Introduction

[1] Jeffrey Stewart Olsen died on 6 October 2020 at the Cairns Hospital following diagnosis and treatment for bowel cancer. Mr Olsen's cancer treatment involved adjuvant chemotherapy, including with capecitabine. Mr Olsen's death occurred after he experienced serious side effects from capecitabine.

[2] These findings address the circumstances of Mr Olsen's death and the appropriateness of the care and treatment provided to him.

Why a coronial investigation?

[3] There was a coronial investigation into Mr Olsen's death because the circumstances in which it occurred required it to be reported to, and investigated by, a Coroner as a health care related death under *the Coroners Act 2003* (Qld) (the Coroners Act).

The role of the Coroner

[4] The role of a coroner is to independently investigate reportable deaths to establish, if possible, who died, when and where that occurred, what caused the person to die and the surrounding circumstances (how the person died). Surrounding circumstances are limited to events that are sufficiently proximate and causally related to the death.

[5] The purpose of a coronial investigation is to establish the facts, not to cast blame or determine criminal or civil liability. A coroner must not include in findings any statement that a person is, or may be –

a. guilty of an offence; or
b. civilly liable for something.

[6] In the coronial jurisdiction, facts must be established on the balance of probabilities.

[7] These findings draw on the totality of the coronial investigation into the death of Mr Olsen, including evidence provided to and obtained by the Court.

Jeffrey Olsen

[8] Jeffrey Olsen was a much-loved husband, father and grandfather.

[9] After a childhood shaped by hard work and perseverance, Mr Olsen left home at the first opportunity to forge a life on his own terms. A commitment he never deviated from.

[10] An adventurer, unrivalled storyteller and keen sailor, Mr Olsen lived life fully. He did so with his best friend and adventure partner, wife Susie by his side. Their relationship was founded on deep love, mutual respect. They were of one mind and heart.

[11] Jeffrey Olsen was the cornerstone of his family - with him in their lives his family felt nothing was impossible. Mr Olsen taught his children to face challenges, solve problems and push themselves beyond their best. He showed them how to live life with grit, curiosity, ingenuity and humility.

[12] On 6 August 2020, aged 64, following a resection of his colon, Mr Olsen was diagnosed with bowl cancer. On 22 September 2020, five and half weeks after surgery, Mr Olsen commenced adjuvant chemotherapy. His chemotherapy treatment involved treatment with capecitabine.

[13] Within three days of commencing capecitabine, Mr Olsen began to experience serious side effects consistent with capecitabine toxicity. He was initially managed by Cairns Hospital oncology outpatient services and Innisfail Hospital inpatient services, before being transferred to Cairns Hospital as an inpatient on 29 September 2020.

[14] On 2 October 2020, blood tests revealed that Mr Olsen had a decreased number of the blood cells that fight infection (he was neutropenic). He was admitted to the intensive care unit of the Cairns Hospital early on 4 October 2020 with progressive septic shock and respiratory failure. Despite extensive efforts by medical staff, Mr Olsen died two days later, on 6 October.

The coronial investigation and decision to hold an inquest

[15] The coronial investigation focused on the health care provided to Mr Olsen, in particular his chemotherapy treatment with capecitabine and the management of risks associated with it.

Capecitabine and DPYD Genetic Variations/DPD Enzyme Deficiency

[16] Capecitabine is chemotherapy drug widely used in the treatment of colon cancer, metastatic colorectal cancer and metastatic breast cancer. Falling within the class of drugs known as fluoropyrimidines, capecitabine is given to patients to slow tumour growth.

[17] When given, a person's body will metabolise capecitabine to its active form (fluorouracil). This occurs because the human body contains the enzyme dihydropyrimidine dehydrogenase (DPD or DPD enzyme).

[18] 3-5% of the population has a genetic variation (the DPYD gene[1] variation) which causes a deficiency in the DPD enzyme. The effect of a DPD enzyme deficiency is that capecitabine cannot be metabolised at normal rates.

DPD Enzyme Deficiency and Fluoropyrimidine Toxicity

[19] If capecitabine is not metabolised or broken down, it accumulates in the body. Approximately 30% to 40% of all patients treated with fluoropyrimidine chemotherapy drugs experience severe toxicity. For those with the DPYD gene variation, the risk of toxicity increases between 1.7 and 5 times. Depending on the DPYD variant, some people may tolerate treatment with capecitabine relatively well, while others – particularly those with no DPD enzyme – are at risk of severe or life-threatening toxicity due to accumulation.

[20] Toxicity associated with DPD enzyme deficiency generally develops within the first two cycles of standard-dose fluoropyrimidine chemotherapy.

[21] The antidote for fluoropyrimidine is uridine triacetate. In cases of life-threatening toxicity, administration of the antidote is time critical.

[22] A person will not usually know they have a genetic variation in the DPYD gene unless they are treated with fluoropyrimidine chemotherapy, or tested for it.

[23] When Mr Olsen commenced treatment with capecitabine in September 2020, national clinical guidelines did not recommend patients be advised about, nor recommended to access, a test to screen for DPD enzyme deficiency. At the time, DPD enzyme deficiency screening tests were not publicly funded; there were no clear treatment paths responsive to screening test results.

[24] In October 2020, the antidote for fluoropyrimidine was not available in Australia and had to be imported when required for use.

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[1] in the dihydropyrimidine dehydrogenase (DPYD) gene – the 'DPYD gene variation'

[25] Mr Olsen's death highlighted the risks of treatment with fluoropyrimidines (capecitabine, 5-fluorouracil (5FU) and tegafur) in circumstances where it is not known whether a person has a DPD deficiency. As such, it was in the public interest to hold an inquest into Mr Olsen's death.

The Inquest

[26] The inquest into Mr Olsen's death commenced on 25 November 2024 at Cairns. One hundred and thirty-one exhibits were tendered, and ten witnesses gave evidence over four days.

[27] The inquest focused on the following issues:

1. The findings required by s. 45(2) of the *Coroners Act*; namely the identity of the Mr Olsen, when, where and how he died and what caused his death.

2. The appropriateness of the treatment and care provided to Mr Olsen by Innisfail Hospital and Cairns Hospital between 14 August 2020 and 6 October 2020, including:

   a. the standard of care available at Innisfail Hospital and Cairns Hospital with respect to adjuvant chemotherapy and whether the treatment and care provided in the relevant timeframe by Cairns and Hinterland Hospital and Health Service (CHHHS) was consistent with that standard of care;

   b. the recommendation, and the process for obtaining consent, to commence adjuvant chemotherapy treatment including with capecitabine;

   c. whether Mr Olsen was a candidate for DPD enzyme deficiency testing;

   d. whether DPD enzyme testing was available;

   e. whether Mr Olsen could have been amenable to treatment with uridine triacetate;

   f. whether uridine triacetate was available.

[28] The parties tendered an agreed statement of facts about Mr Olsen's diagnosis and treatment. Those facts are consistent with the evidence otherwise tendered and are adopted in these findings. Mr Olsen's family gave a statement about his life and the impact that his death has had on them.

[29] In addition to the practitioners directly involved in Mr Olsen's care, or a review of it, the following expert witnesses gave evidence:

(a) Dr Abhishek Joshi, Senior Staff Specialist and Clinical Director Medical Oncology, Townsville Hospital and Health Service, who was engaged as an independent expert by the Northern Coroner and produced an expert report;

(b) Associate Professor Melissa Eastgate, Operations Director, Cancer Care Services, Royal Brisbane and Women's Hospital; Executive Director, Cancer Care Stream Metro North Hospital and Health Service; Chair, Medical Oncology Group of Australia, who gave evidence in her capacity as Co-Chair of the Queensland Cancer Clinical Network on behalf of Queensland Health;

(c) Associate Professor James Lynam, Clinical Director, Medical Oncology, Calvary Mater Newcastle, who gave evidence in his capacity as the Deputy Chair of the Medical Oncology Group of Australia;

(d) Dr Natalie MacCormick, Senior Forensic Physician from the Clinical Forensic Medicine Unit, who reviewed and commented on the circumstances of Mr Olsen's death.

Mr Olsen's diagnosis and treatment

[30] On 14 July 2020, Mr Olsen had a colonoscopy at Innisfail Hospital that identified a tumour in his colon. The colonoscopy was scheduled because Mr Olsen had returned a positive faecal occult blood test and been referred on to the Cairns and Hinterland Hospital and Health Service (the CHHHS) by his GP.

[31] Mr Olsen's case was discussed at the Cairns Hospital Oncology Multidisciplinary Team (MDT) meeting on 24 July 2020. The plan was to proceed with surgery.

[32] On 6 August 2020, Mr Olsen underwent a high anterior resection at the Cairns Hospital. Mr Olsen was diagnosed with bowel cancer by the surgical team. The cancer was 'stage 3b, pT3N2a, bowel cancer'. The surgical resection was successful, and the tumour was removed with margins that were described as "well clear". Pathology indicated that vascular and lymphatic invasion was present and that four of the 27 resected lymph nodes had cancer involvement. Mr Olsen was discharged four days after surgery, on 10 August 2020.

[33] Following an Oncology MDT meeting on 14 August 2020, Mr Olsen was referred to medical oncology to discuss adjuvant chemotherapy. Dr Megan Lyle, Consultant Medical Oncologist, and Dr Tasafin Hossain, Medical Oncology

Advanced Trainee Registrar, attended the MDT meeting, which was documented by Dr Hossain.

[34] On 19 August 2020, Mr Olsen was reviewed at the Innisfail Surgical Outreach Clinic. Mr Olsen reported irregular and more frequent bowel motions since the resection. Mr Olsen was advised that the Oncology MDT had referred him to Medical Oncology.

[35] On 14 September 2020, Mr Olsen was reviewed at the Cairns Hospital Medical Oncology outpatient clinic to discuss adjuvant chemotherapy. Dr Lyle notes that Dr Hossain's Outpatient Progress Note records an impression that Mr Olsen was suffering from Stage Ill Colorectal Cancer with high risk features, which she agreed with.

[36] Dr Hossain obtained Mr Olsen's consent. Mr Olsen was informed of potential adverse effects including neutropenic sepsis. Mr Olsen and Dr Hossain signed a two page consent form "Systemic Anti-Cancer Therapy Consent". Mr Olsen's wife, Susan Olsen, was present during the consent process.

[37] The boxes in section "E. Other Significant Risks" of the consent form were not checked. The risks listed there include "death". However, Dr Hossain signed an acknowledgement of having explained the points in sections including "E".

[38] The consent form signed by Mr Olsen included an acknowledgement of matters that based consent, including that "I understand the life-threatening nature of treatment side effects and hence the need to report to Emergency Department in case of any problems during or after treatment."

[39] The progress note entered by Dr Hossain read in part:

> S/B Dr Lyle
>
> - Recommend 6 months adjuvant doublet chemotherapy - CAPOX
> - Discussed role and rationale for chemotherapy in this setting
> - Discussed AEs of this regimen - neutropenic sepsis, peripheral neuropathy, diarrhoea, fatigue + others
> - Jeff and Sue concerned about the length of time but would like to proceed
>
> Plan
>
> 1. Consented for XELOX
> 2. Chemo Education
> 3. Baseline bloods and chart review for result prior to chemo
> 4. Review prior to C2

[40] Dr Lyle explained that the plan documented by Dr Hossain was that Mr Olsen would:

(a) undergo adjuvant chemotherapy with XELOX;

(b) be booked in for chemotherapy education;

(c) submit to blood testing for baseline blood levels to be obtained and reviewed by way of chart review prior to the commencement of chemotherapy;

(d) be reviewed again prior to his second cycle of chemotherapy.

[41] Following the consultation on 14 September 2020, Dr Hossain wrote a letter to Mr Olsen's referring surgeon about the consultation. Dr Hossain wrote "In summary, Jeffrey is a fit and well gentleman with a high risk stage 3 colorectal cancer which warrants adjuvant chemotherapy". Dr Hossain also noted:

> … we discussed the role and rationale for adjuvant chemotherapy and recommended 6 months of CAPOX. We discussed the adverse effects of this regimen including, but not limited to, neutropenic sepsis, peripheral neuropathy, diarrhoea, fatigue and rash. Jeffrey was a little taken aback by the length of time we were recommending this treatment and the intensiveness of it. However, he is definitely agreeable to proceed, given the goal of reducing his risk of recurrence and improving cure rates. He therefore has consented to the CAPOX regimen and will have chemo education. He will have some baseline bloods prior to starting and we may be able to get his future treatment done closer to home.

[42] On 21 September 2020, Mr Olsen and Mrs Olsen attended a chemotherapy education session at the Cairns Hospital Chemotherapy Day Unit with RN Ashleigh Burton, who was working as the education nurse that day. RN Burton did not recall the education session she delivered to Mr Olsen but advised that a registered nurse is assigned to be the education nurse each day in the Oncology Day Unit. The sessions were part of the process that occurred once a patient had been prescribed chemotherapy. The education sessions "were lengthy, often lasting more than one hour, and involved … the clinical course of a patient undergoing chemotherapy treatment. This included education in relation to the chemotherapy itself, expected side effects and what to do about them, and communication with the hospital in relation to both care coordination and clinical concerns."

[43] RN Burton advised that the usual practice when providing education to patients prior to their receiving chemotherapy includes taking them through a PowerPoint presentation "Understanding Chemotherapy". The presentation covers topics such as neutropenia and that it can be life threatening, and indicates a number of triggers for attending the nearest emergency department.

[44] RN Burton gave Mr Olsen an information package that included: the eviQ patient information for XELOX/CAPOX; a Treatment Diary; the Cancer Council booklet "Understanding Chemotherapy"; the eviQ information sheet "Guarding Against Infection Risk"; and a Medical Alert Card with the contact details for the Oncology Day Unit.

[45] On 22 September 2020, Genevieve Messina, Senior Pharmacist in the Cairns Cancer Care Pharmacy counselled Mr Olsen about the administration and dose of his chemotherapy drugs CAPOX – the combination of drugs Capecitabine and Oxaliplatin – in the company of his wife. Ms Messina documented the counselling provided in a progress note.

[46] Ms Messina advises that it was, and continues to, be usual practice for the Cairns Cancer Care Pharmacy pharmacist providing education and counselling services to provide patients with a patient information pack that includes general and specific information in relation to the patient's treatment regime, along with a printed medication list, and a medical alert card with contact details on it for the Cairns Cancer Care Service.

[47] Ms Messina advised that it was, and continues to be, her usual practice to counsel patients about triggers for emergency attendance when discussing side effects of chemotherapy; "to explain to the patient in simple terms that they should present to the emergency department if they are experiencing uncontrolled nausea and/or uncontrolled vomiting that is more than is usual for them." Ms Messina noted that while she did not specifically recall, she believes she would have provided this counselling to Mr Olsen.

[48] Ms Messina advised that it was, and continues to be, usual practice for a pharmacist from the Cairns Cancer Care Pharmacy team to contact patients by phone seven days after they commence chemotherapy treatment, however notes that Mr Olsen was in hospital at that time.

[49] On 22 September 2020, Mr Olsen started adjuvant chemotherapy with intravenous oxaliplatin 250 mg over two hours and oral capecitabine at the Day Unit. RN Burton provided the IV oxaliplatin to Mr Olsen and documented his attendance and treatment in a progress note.

[50] The treatment regime planned for Mr Olsen was for eight CAPOX cycles of 21 days. Mr Olsen was to take capecitabine 2,000 mg twice daily in tablet form for

14 days, followed by 7 days off capecitabine before commencing the next 21 day cycle. Oxaliplatin would be administered by IV at the start of each new cycle.

[51] Ms Messina advised that it was, and continues to be, usual practice for a pharmacist from the Cairns Cancer Care Pharmacy Team to screen and verify orders for chemotherapy medication. She has reviewed the prescribed dose of capecitabine, and it was correctly calculated in accordance with Mr Olsen's height and weight taken on 14 September 2024, which had not significantly changed when he commenced chemotherapy on 22 September 2020.

[52] Dr Lyle explained that the plan reflected a standard course for a patient who is proceeding to undergo adjuvant chemotherapy. XELOX is a combination adjuvant chemotherapy regime combining Oxaliplatin and Capecitabine and is "standard adjuvant chemotherapy for patients with Stage III colorectal cancer." The usual regime includes eight cycles each lasting three weeks. Intravenous Oxaliplatin is administered in the Oncology Unit on day 1, two weeks of oral Capecitabine at home, and a week's break. Patients are reviewed by a Medical Oncologist at the commencement of each cycle.

[53] On Friday, 25 September 2020, Mr Olsen contacted the Cairns Hospital Chemotherapy Day Unit raising concerns about his symptoms. Mr Olsen spoke with RN Emma Rose-Basha. RN Rose-Basha said her impression was that Mr Olsen was calling to report side effects of his chemotherapy treatment, as he had been educated to do. RN Rose-Basha documented the conversation in the medical record.

[54] With respect to Mr Olsen's diarrhoea, RN Rose-Basha noted that Mr Olsen reported that he had experienced diarrhoea as the "new normal" following bowel surgery and that it had been slightly worse since commencing the chemotherapy. Mrs Olsen reported that the diarrhoea was "explosive" but Mr Olsen stated that it was "not that bad". Mr Olsen said he had taken three doses of gastrostop the previous day and that his diarrhoea was much improved. He reported one bowel movement that morning and that he was not concerned about his diarrhoea that day.

[55] RN Rose-Basha considered most of the symptoms Mr Olsen had reported were mild and controlled, but for his having a "puffy" and "bright red" face. RN Rose-Basha noted that "if Mr Olsen had reported worse symptoms of diarrhoea, or diarrhoea associated with abdominal pain, cramping and/or blood in the stool, then this would have been regarded as a red flag which may have prompted advice to cease taking oral Capecitabine and to present to the Emergency Department."

[56] After speaking with Mr and Mrs Olsen, RN Rose-Basha discussed the matter with Dr Hossain. Dr Hossain advised that Mr Olsen reported side effects that were

within the expected typical side effects and that there was no clear indication to either cease chemotherapy or escalate his condition for consultant input.

[57] Dr Hossain recommended Mr Olsen continue capecitabine but monitor his bowel motions and if his diarrhoea or symptoms worsen, present to the emergency department for review. RN Rose-Basha called Mr Olsen back and advised Mr Olsen to present to the emergency department if he was febrile, if his facial rash became worse or itchy, or if he had more than eight bowel motions in 24 hours. RN Rose-Basha advised Mr Olsen that she would book a follow up call for Monday.

[58] On Sunday, 27 September 2020, Susan Olsen rang the Cairns Hospital and 13HEALTH advised her that Mr Olsen should present to the nearest emergency department. Mr Olsen presented to the Emergency Department at the Innisfail Hospital at approximately 14:45 with ongoing diarrhoea and facial erythema extending to neck, upper torso and axilla. He was prescribed dexamethasone 4mg bd and ondansetron. Mr Olsen was advised to cease capecitabine. Mr Olsen was advised to return for review on sign of infection or deterioration, but otherwise had a scheduled oncology nurse review the next day. The Innisfail clinical notes document "last dose of capecitabine on Sunday night."

[59] On Monday, 28 September 2020, the scheduled phone call between the outpatient day unit registered nurse Caroline Liesegang and Mr Olsen took place at 3.43 pm. Mr Olsen reported that his symptoms had worsened over the weekend, including that his diarrhoea had increased. He advised that he had attended Innisfail Hospital, ceased capecitabine and been prescribed dexamethasone twice daily. He reported a small improvement in his symptoms. RN Liesegang told Mr Olsen that she would discuss his symptoms with Dr Hossain and advise.

[60] RN Liesegang noted that Mr Olsen's reporting of his symptoms at this time did not raise alarm or concern. If she had been concerned, she would have advised Mr Olsen to present to the Emergency Department and documented this.

[61] RN Liesegang emailed Dr Hossain and advised Mr Olsen had presented to hospital, been discharged and had ceased capecitabine. Dr Hossain saw the email later that day and planned to call Mr Olsen the following day. It is documented in the Clinical Review that Dr Hossain replied at 7.42 pm including to say Mr Olsen should stay off capecitabine.

[62] At 5.25 pm that day, 28 September 2020, Mr Olsen presented to the Innisfail Hospital Emergency Department. He reported symptoms including diarrhoea every one to two hours and decreased oral fluid intake because it was painful to swallow. He was alert and his visual observations were normal. He was given saline for rehydration and advised to take loperamide 2 mg every 2 hours. Innisfail Hospital staff emailed oncology at Cairns Hospital at 9.12 pm advising

that Mr Olsen had presented with "Grade 3-4 diarrhoea, ongoing facial erythema and homogenous white coating to tongue and oropharynx" and requested a tele or video conference with Mr Olsen on Wednesday, 30 September 2020.

[63] Dr Hossain was still at work and received the email from Innisfail Emergency Department. She called Mr Olsen on his mobile and spoke with Mrs Olsen and the treating practitioner at Innisfail Hospital. She recommended Innisfail Hospital call the on-call oncology consultant Dr Lui to discuss the case; advised that Mr Olsen was for transfer to the Cairns Hospital Inpatient Cancer Care Ward and then advised Dr Lui of same.

[64] Dr Lui was contacted and a transfer to Cairns Hospital was arranged. Mr Olsen was admitted to Innisfail Hospital Emergency Department 'on leave' to be discharged and admitted to Cairns the next day. The Innisfail Hospital progress notes document that Dr Lui noted "given timeline of events … ?enzymatic deficiency leading to abnormal clearance of medication." Dr Lui notes that Mr Olsen was experiencing severe chemotherapy related side effects which in the circumstances caused him to consider DPD enzyme deficiency.

[65] On 29 September 2020, Mr Olsen was admitted to Cairns Hospital under the care of medical oncologist Dr Lyle after review by Dr Padgham, a registrar completing a three month rotation in Medical Oncology. The documented issues and plan were:

> Issues:
>
> 1. Rash and Oedema ?Capecitabine reaction
>
> 2. Diarrhoea
>
> 3. Mucositis
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> Plan:
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> - Admit Medical Oncology. Under Dr Lyle.
> - Bloods and IVC
> - Full examination on ward.
> - Withhold Capecitabine (?Reaction). Dr. Lui to discuss with Path Lab ?Dihydropyrimidine Dehydrogenase (DPD) mutation.
> - IVH
> - Mucositis Regime (Xylocaine Viscous, Sodium Bicarb, Difflam)
> - Codeine + Loperamide regular (with additional PRN Loperamide)
> - Continue Weaning Dex (4mg BD today, then reduce by 2mg every 2 days).

Reviewed by Dr. Lui in Transit Lounge. Plan as above.

[66] Dr Padgham recalled that "the thinking at the time was that Mr Olsen was experiencing known adverse side effects of chemotherapy. …That this was a reasonably common patient presentation for patients on the oncology ward at that time and Mr Olsen's presentation was not considered particularly alarming at that time."

[67] As to Dr Padgham's noting a plan for "Dr. Lui to discuss with Path Lab ?Dihydropyrimidine Dehydrogenase (DPDJ mutation", Dr Lui enquired and was informed by Pathology Queensland that that DPD enzyme-deficiency testing was only available in the private sector. The Pathology Queensland pathologist recommended genetic testing, also only available in the private sector, and which had a 10 day turnaround time [for results].

[68] Dr Lui states that he was aware of there being an antidote treatment for fluoropyrimidine toxicity, but that he did not turn his mind to the possibility of obtaining the antidote treatment for Mr Olsen's presentation. This included because it was only available in Australian under a Special Access Scheme, sourced from overseas, and he "did not consider it to be an option to seek to obtain access to treatments that were not approved nor available."

[69] On Wednesday, 30 September 2020, Mr Olsen's symptoms were worse. Dr Lui noted the assessment was that Mr Olsen required ongoing symptom management and supportive care for a chemotherapy reaction. The management plan was to take Mr Olsen off his chemotherapy, "allow time for it to work its way out of his system, manage his symptoms and support his recovery, in the hope that his symptoms will subside and the toxic effect of chemotherapy goes away."

[70] On Thursday, 1 October 2020, it was recorded that Mr Olsen was feeling "mildly improved", his facial rash was either "slightly lessened" or "about the same" (depending on the progress note read) and codeine was noted to be effective for pain. Dr Padgham noted Mr Olsen had no fevers and was not neutropenic or otherwise acutely unwell. The plan was to continue supportive measures to manage the side effects of chemotherapy. Treatment included ongoing IV fluids, IV pantoprazole and symptomatic measures for thrush and the facial rash. Dexamethasone weaning was commenced. Blood tests showed his platelets "had dropped" to 89 x 10^9/L (reference range 140-400) and that his white cell count was 2.3 x 10^9/L and neutrophil count was 1.73 x 10^9/L.

[71] On review during the ward round by registrar Dr Padgham and Resident Medical Officer Dr McEniery on Friday, 2 October 2020, Mr Olsen was noted to be "subjectively markedly worse from yesterday". His blood test showed that he was neutropenic with a neutrophil count 0.06 x 10^9/L and white cell count of 0.3 x 10^9/L. The risk of Mr Olsen contracting an infection was recognised. He was

commenced on IV antibiotic piperacillin/tazobactam and an oral antifungal, fluconazole. He was prescribed oral and subcutaneous morphine for perianal and oral pain as needed.

[72] Mr Olsen was moved to a single room on 2 October 2020. The notes from the Cancer Care Services Morbidity and Mortality Meeting of 13 November 2020 record that Mr Olsen was moved from a two-bed room to a single room before he was found to be neutropenic.

[73] On Saturday, 3 October 2020, on review by consultant Dr Lui and registrar Dr Padgham, Mr Olsen showed signs of acute kidney injury. He was afebrile. Dr Padgham noted that "Overall, at that stage, it seemed that Mr Olsen was becoming more unwell." He had ongoing neutropenia and low platelet count – described in the clinical review as "severe myelosuppression". Treatment with short acting filgrastim was commenced. That DPD enzyme deficiency affects the ability to metabolise capecitabine was discussed. DPD enzyme deficiency testing was discussed with Mr Olsen. Mr Olsen indicated that "probably won't proceed at this point" because he was "not planning to undergo further chemotherapy following this severe reaction". Mr Olsen was reviewed by a dietician who documented the following assessment "Grossly inadequate oral intake to meet requirements related to mucositis - Treating team aware."

[74] At 9.30 am on 3 October 2020, Mr Olsen's observations were consistent with the making of a medical emergency team (MET) call because he had blood pressure of 85/54. The treating medical team – Dr Lui and Dr Padgham – were still on the ward and were informed of Mr Olsen's hypotension and immediately attended. IV boluses were ordered and observation frequency increased. Mr Olsen's blood pressure improved to 91/62 at 10.20 am[2] and 102/68 at 4.29 pm.

[75] At 7.53 pm on 3 October 2020, a MET call was made – Mr Olsen had hypotension (64/54), persistent tachycardia (152) and reduced urine output. The medical emergency team ordered fluid boluses and a 4% albumin infusion and Mr Olsen was to be reviewed in an hour.

[76] At 11.32 pm, and after review by the ICU registrar who was still on the ward (noted as present in the vital signs observations at 10.10 pm, 10.21 pm), Mr Olsen's blood pressure dropped to 75/41. The decision was made to transfer him to the ICU.

[77] At 2.04 am on Sunday, 4 October 2020, Mr Olsen arrived in the ICU. A CT pulmonary angiogram was performed on the way to ICU, which showed pulmonary consolidation but no embolism.

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[2] Cairns Hospital notes at 78.

[78] Mr Olsen was admitted to the ICU at 2.27 am with haemodynamic instability likely due to sepsis. He was commenced on vasoactive support with metaraminol and noradrenalin and additional and broader antibiotics were added.

[79] Dr Lui reviewed Mr Olsen in the ICU on the morning of 4 October 2020. Dr Lui noted Mr Olsen remained neutropenic with myelosuppression. His impression was that infection was the most likely cause for Mr Olsen's ongoing acute deterioration. Dr Lui noted that the plan remained to continue supportive therapies in the ICU including Filgastrim to stimulate the bone marrow system to release neutrophils in an effort to improve Mr Olsen's immune response. Dr Lui noted that despite receiving all indicated sportive therapies, unfortunately, Mr Olsen's condition was not improving.

[80] On Monday, 5 October 2020, Mr Olsen continued to be treated with the noradrenaline infusion, and an amiodarone infusion was commenced for persistent tachycardia with atrial flutter. He continued to experience large, frequent bowel actions.

[81] At approximately 8.00 pm on 5 October 2020, Mr Olsen had a sudden deterioration with progressive septic shock and respiratory failure. He was intubated and ventilated. He developed multi-organ failure with coagulopathy and likely pulmonary haemorrhages, oligoanuric renal failure, atrial fibrillation and a mixed respiratory and metabolic acidosis. Mr Olsen required increased noradrenaline, adrenaline and vasopressin infusions. Fresh frozen plasma and platelet infusions were administered, and electrolytes were optimised. An infectious diseases consultant advised the addition of antibiotics anidulafungin and azithromycin. Mr Olsen's family were informed of his continuing deterioration.

[82] Tragically for his family, and despite the efforts of the treating team, Mr Olsen died in the intensive care unit of Cairns Hospital at 3.00 am on 6 October 2020.

[83] On 12 October 2020, Strenotrophomonas maltophilia was identified in blood cultures which were collected from Mr Olsen on 6 October 2020.

[84] A clinical review which occurred after Mr Olsen's death identified that Strenotrophomonas maltophilia is:

> … a multi-drug resistant bacterium that can colonise the gut and has high morbidity and mortality in immunocompromised patients. Blood cultures prior to this were negative. This organism was resistant to the antibiotics administered to the patient as per the *Neutropenic Sepsis/Febrile Neutropenia (or Suspected) in Adults - Patient Management Procedure.* It was sensitive to trimethoprim sulfamethoxazole (Bactrim) however this is not routinely prescribed to neutropenic patients as it may produce further

> bone marrow suppression. The site of infection leading to this patient's bacteraemia and sepsis response was not identified, however this is most likely to be as a result of his severe gastrointestinal mucositis.

Was the treatment and care provided to Mr Olsen appropriate?

[85] The inquest examined the appropriateness of the treatment and care provided to Mr Olsen by Innisfail Hospital and Cairns Hospital between 14 August 2020 and 6 October 2020. In doing so, six sub issues were considered. Namely:

(a) the standard of care which was available and provided to Mr Olsen;

(b) the recommendation and process of obtaining his consent to chemotherapy treatment;

(c) candidacy and availability of DPD enzyme deficiency tests; and

(d) the availability and effectiveness of uridine triacetate treatment.

What was the standard of care available to Mr Olsen at Innisfail and Cairns Hospitals?

[86] The inquiry into the appropriateness of treatment and care provided to Mr Olsen involved an assessment of what standard of care for adjuvant chemotherapy was available to Mr Olsen at Innisfail Hospital and Cairns Hospital between 14 August 2020 and 6 October 2020, and whether Mr Olsen received that standard of care.

[87] The assessment of the standard of care, both available and offered, to Mr Olsen must occur in the context of his illness. At the time that treatment was recommended, despite surgical removal of his colon tumour, Mr Olsen had a very high-risk colon cancer. The cancer was found to have infiltrated into Mr Olsen's subserosal tissue. Four out of his 27 resected lymph nodes had cancer involvement and Mr Olsen also had two extramural tumour deposits.

[88] The evidence of senior consultant medical oncologists based at different public hospitals – A/Prof Eastgate, Dr Joshi, A/Prof Lynam, Dr Lyle – was that the standard of care for medical oncology is a national one informed by guidelines for cancer treatment protocols and related information. The national guidelines and related information are contained in an online resource run by the Cancer Institute New South Wales and partially funded by the other states. Known as 'eviQ', guidelines are developed through a consensus expert opinion.

[89] A/Prof Eastgate advised:

> eviQ is endorsed nationally as the primary source of evidence-based cancer treatment information and is deeply integrated into clinical practice in most cancer units (public and private) across Australia. Queensland Health does not have its own separate guidelines concerning cancer treatment protocols.

[90] The evidence, which was not contested, was Mr Olsen was recommended for, and commenced on standard adjuvant chemotherapy for patients with Stage III colorectal cancer. The standard chemotherapy treatment regime for patients with Stage III colorectal cancer with high risk features, such as Mr Olsen, was a 6 month course of combination capecitabine and oxaliplatin (CAPOX). It was standard protocol was to commence capecitabine/oxaliplatin therapy as an outpatient.

[91] The expert evidence was fluoropyrimidine based chemotherapy, including capecitabine, was (and remains) "the chief backbone of treatment" and the appropriate choice of chemotherapy in Mr Olsen's circumstances. It was explained by Dr Joshi that unfortunately in bowel cancer, and for Mr Olsen, there is no substitute for 5-fluorouracil capecitabine.

[92] The recommendation for chemotherapy treatment with CAPOX for Mr Olsen was consistent with recommended standard of care for a patient like Mr Olsen in 2020 in Queensland, nationally, and in the developed world.

[93] Adjuvant chemotherapy was available to Mr Olsen at Innisfail and Cairns Hospitals. The evidence at inquest was the care available care for adjuvant chemotherapy was consistent the policies, practices and procedures of Cairns and Hinterland Hospital and Health Service in 2020. Furthermore, the standard of care available at Innisfail Hospital and Cairns Hospital for adjuvant chemotherapy was consistent with the national standard at the time, as reflected in the eviQ guidelines.

[94] In relation to the standard of care provided to Mr Olsen, it was submitted:

(a) on 25 September 2020, further information or more detailed symptoms ought to have been elicited from Mr Olsen when he rang the Cairns Hospital medical oncology clinic to report his symptoms. It was submitted that Mr Olsen had additional oral symptoms and crunchy jaw pain that was not reported and/or recorded. It was also submitted that the extensiveness of his diarrhoea was not documented.

(b) on 27 September 2020, there was inadequate communication between Innisfail Hospital and Cairns Hospital.

(c) on 28 September 2020, the nurse who spoke with Mr Olsen inadequately assessed his symptoms and risk, and did not escalate his care appropriately.

[95] The oral symptoms, crunchy jaw and more severe diarrhoea which were described in submissions contrasted with the evidence at inquest and contemporaneous record of what information was obtained from or about Mr Olsen. The submissions also contrasted with the evidence and records of what information was shared between clinical staff about Mr Olsen and his symptoms.

[96] There is no doubt that Mr Olsen was experiencing symptoms which concerned both him and his wife when he called the Clinic on 25 September 2020. However, I must consider the evidence in the context of Mr Olsen's rapid deterioration between 22 September and 6 October 2020, the passage of time, and the subjective nature of the information which is said to have been missed. In light of those factors, and having regard to the evidence I cannot make a finding that the seriousness of Mr Olsen's condition on 25 September 2020 was more serious than was understood and recorded and if so, where the communication breakdown lay.

[97] On the whole of the evidence, I am unable to find that the communication between Innisfail and Cairns Hospital on 27 September 2020 was inadequate. I am unable to discern whether there was a misunderstanding or miscommunication as to the extent of Mr Olsen's symptoms, and therefore the grade of toxicity, on 25, 27 or 28 September 2020. In circumstances where Mr Olsen attended the Innisfail Hospital Emergency Department on 27 and 28 September 2020, and his admission to Cairns Hospital was arranged the evening of 28 September 2020 I am unable to find staff inadequately assessed Mr Olsen's symptoms and risk, and did not escalate his care appropriately.

[98] It was apparent from the evidence that the health practitioners who cared for Mr Olsen understood the importance of the eviQ guidelines his treatment was informed by them.

[99] The recommendation for Mr Olsen to commence adjuvant chemotherapy treatment with capecitabine was clinically indicated and consistent with local, state and national standards.

[100] Having regard to the evidence, I am satisfied Mr Olsen had access to, and was provided with, care at Innisfail Hospital and Cairns Hospital which was consistent with the expected standards of care.

Was the recommendation and the process for obtaining Mr Olsen's consent to commence treatment appropriate?

[101] In determining the appropriateness of Mr Olsen's care and treatment, the inquest considered the recommendation given to Mr Olsen to commence adjuvant

chemotherapy treatment, including with capecitabine, and the process by which his consent was obtained.

[102] Although the education Mr Olsen received about the chemotherapy regime is not strictly relevant to the question of whether his consent was obtained properly, how well he was educated about the chemotherapy before he received it, is a related and relevant issue that was ventilated at the inquest.

[103] The facts about the decision to recommend adjuvant chemotherapy and the consent and education process formed part of the agreed facts about Mr Olsen's diagnosis and treatment were agreed. Thus, they have been set out above.

[104] The manner in which Mr Olsen was seen and his consent obtained ("consented") at the outpatient medical oncology clinic at the Cairns Hospital on 14 September 2020 was consistent with the usual practice at Cairns Hospital. Advanced trainees, such as Dr Hossain, would see new patients, obtain their history and run through their indications for chemotherapy. Advanced trainees would then introduce the consultant and ensure the consultant agreed with plan formulated by the trainee, as well as answer any patient questions.

[105] Dr Lyle spoke with Mr Olsen during the consent process and, in evidence, recalled that she reiterated the rationale for recommending adjuvant chemotherapy was based on the high-risk nature of Mr Olsen's colorectal cancer.

[106] In addition to education given to Mr Olsen at the medical oncology appointment, information and education was provided by nursing and pharmacy staff. A review by Cairns Hospital after Mr Olsen's death noted:

> Adverse effects of the proposed chemotherapy regime were verbally discussed at the patient's medical oncology appointment on 14/9/2020. This included infection and neutropenic sepsis, peripheral neuropathy, coronary vasospasm (chest pain), mucositis, diarrhoea, fatigue and rash. The possibility of severe toxicity including death was discussed although the tick box for "death" under the heading "other significant risks" had not been marked.

[107] The inquest considered whether the risk of death may have been made clearer to Mr Olsen during the consent process. I am satisfied the information, and volume of information, provided to Mr Olsen by oncologists, nursing and pharmacy staff before he commenced chemotherapy treatment was such that the warning that the treatment carried a risk of severe and potentially life-threatening side effects was plainly evident.

[108] It was submitted that the consent process ought to have included information that a failure to properly metabolise capecitabine could result in a fatal toxic reaction.

In 2020, advising cancer patients such as Mr Olsen about DPD enzyme deficiency vis-à-vis metabolization of capecitabine and fatal toxicity was not standard or recommended practice.

[109] Whilst the inquest heard that a senior consultant medical oncologist may have gone into that level of detail with Mr Olsen, in 2020 Dr Hossain was not a consultant and the process which was undertaken accorded with standard practice.

[110] The effect of the expert evidence, which I accept, is that Mr Olsen was properly consented and educated about the proposed chemotherapy regime, in line with the standard of care that applied and the level of experience of the practitioners who conducted the consent and education.

Was Mr Olsen a candidate for DPD enzyme deficiency testing and was it available?

[111] Whilst the care provided to Mr Olsen followed the Australian guidelines, the circumstances surrounding his death provided further support for reviewing the accessibility of DPD deficiency testing and uridine triacetate in Australia.

[112] Thus, in the context of the appropriateness of Mr Olsen's care and treatment, the inquest considered:

(a) whether Mr Olsen was a candidate for DPD deficiency testing prior to commencing capecitabine; and

(b) whether DPD deficiency testing was available in August and September 2020.

[113] DPD enzyme deficiency testing was, and remains, the only way in which a relevant DPYD genetic variation can be diagnosed.

[114] DPD enzyme deficiency testing was not discussed with, or to recommend to, Mr Olsen.

[115] In August and September 2020, DPD enzyme testing was not readily accessible not publicly funded, nor was there one preferred test. The turnaround time for results was lengthy and inconsistent. There was limited evidence as to how results should be interpreted and there were no clear treatment pathways where a person had a complete or a partial deficiency.

[116] Those factors, along with the urgency to commence chemotherapy treatment as close to surgery or diagnosis where necessary, and the predominance of capecitabine use in treatment, meant that in practicality the barriers were such

that it was not considered an option. As such, the Medical Oncology Group of Australia (MOGA) took the position that for these reasons, DPD enzyme testing ought not be recommended to patients.

[117] In August September 2020, eviQ did not recommend DPD enzyme deficiency testing be discussed with or recommended to patients. The relevant eviQ treatment guideline "Dihydropyrimidine dehydrogenase (DPD) enzyme deficiency" version 4, stated that there were two main tests for DPD deficiency – genotyping of DPYD or measuring the DPD phenotype. It described a "wide range of DPD activity between patients" noting that between 3 to 8% of the population have up to a 50% deficiency, whereas only 0.1% have a total deficiency. Impacted patients "will have typical fluoropyrimidine toxicity but this tends to appear much earlier and be more severe and prolonged".

[118] The eviQ guideline stated that:

> Currently no regulatory body - US Food and Drug Administration (FDA), European Medicines Agency (EMA) or Therapeutics Goods Administration (TGA) – or international guidelines – including European Society of Medical Oncology (ESMO) and National Comprehensive Cancer Network (NCCN) - require or recommend genetic testing prior to the administration of fluoropyrimidines.
>
> Whilst the product information for both capecitabine and fluorouracil warn about the potentially fatal reactions attributed to DPD deficiency, it does not stipulate that genetic testing must be performed.

[119] It was not a standard part of medical oncology practice in the public health system in Queensland in 2020 to discuss DPD enzyme deficiency testing, or to recommend such testing.

[120] I accept the expert evidence that it was likely that Mr Olsen was DPD enzyme deficient given how rapidly he experienced severe complications. Dr Joshi's expert evidence was that had DPD enzyme test results been available within a week, they could have allowed for Mr Olsen's dosage to have been adjusted prior to commencing therapy with capecitabine. However, Dr Joshi noted that practically, even at the time of the inquest years later, the turnaround time was still longer than a week, particularly in regional areas.

[121] Mr Olsen was plainly a candidate, or person who could have been tested for, DPD enzyme deficiency in 2020. At the time he commenced chemotherapy treatment, DPD enzyme deficiency testing was available if privately funded. However, Mr Olsen's test results may not have been available in time to inform his treatment pathway nor meaningfully informed decision making around dosage.

[122] That testing for DPD enzyme deficiency was not discussed with, or recommended to, Mr Olsen prior to his treatment with capecitabine was consistent with the eviQ guideline and national practice at the time. Thus, I am satisfied that it was appropriate.

Treatment with uridine triacetate

[123] Uridine triacetate is the only antidote, in layman's terms, to overdose or overexposure to capecitabine. As such, in considering the appropriateness of Mr Olsen's care and treatment, the inquest heard evidence about:

(a) whether Mr Olsen could have been amenable to treatment with uridine triacetate; and

(b) whether uridine triacetate was available.

[124] The colorectal adjuvant CAPOX protocol has the following warning: *Fluoropyrimidine overdose or overexposure may result in severe or life-threatening toxicity. An antidote is available and is highly effective if given within 96 hours*. Despite the CAPOX protocol referring to an antidote for capecitabine toxicity, uridine triacetate is not approved for use in Australia by the Therapeutic Goods Administration (TGA).

[125] At the time of Mr Olsen's death in October 2020, uridine triacetate was not approved for use, no stock of was held in Australia and it could only be accessed by the Special Access Scheme, which allowed health practitioners to access an 'unapproved' therapeutic good for a single patient, on a case-by-case basis. In 2020, the cost of importing uridine triacetate was approximately $125,000 and the process for obtaining it was not widely known or understood in the oncology community.

[126] The evidence does not establish whether Mr Olsen was a candidate for treatment with uridine triacetate or whether its use was clearly indicated for him. Regardless, consideration was not given to accessing or using uridine triacetate in Mr Olsen's case.

[127] Given the barriers to access in 2020, it appears that uridine triacetate would not have been able to have been sourced within 96 hours of Mr Olsen ceasing capecitabine. Had uridine triacetate been sourced, and Mr Olsen treated with it, there is insufficient evidence to find that it would have prevented his death.

Current availability of uridine triacetate

[128] Since Mr Olsen's death there has been a material change to the availability of uridine triacetate in Australia.

[129] Uridine triacetate:

(a) is now stored at the Peter MacCallum Centre, Melbourne, and has been since 14 August 2024.

(b) is not approved for use by the TGA;

(c) needs to be accessed via the Special Access Scheme;

(d) continues to cost over $100,000 to access.

[130] Between 14 August 2024 and the inquest in November 2025, two applications were made to access uridine triacetate. The applications were approved and the drug was supplied to a hospital in Western Australia and a hospital in Queensland.

[131] That advent of a national repository makes uridine triacetate available to any hospital within Australia within a short timeframe.

[132] A lack of public funding for the drug means any hospital wishing to access it for a patient has to fund the cost, which at the time of the hearing was $135,000 plus GST. The evidence was that it can be difficult to identify acute, severe toxicity in a patient, and a strong evidence base would be required to justify the expense to a hospital. The inquest heard severe toxicity has to be identified very early, and then the administrative process of obtaining the drug within the appropriate timeframe still has to be overcome but was not unachievable.

Findings and Comments

Findings Required by Section 45 Coroners Act 2003 (Qld)

[133] The findings required by section 45(2) of the *Coroners Act 2003* (Qld) were not in dispute, save for the cause of Mr Olsen's death. There was disagreement as to how the cause of Mr Olsen's death ought to be expressed.

[134] The responsibility of a coroner to find, if possible, the medical cause of death is necessarily informed by expert medical opinion.

[135] Dr Paul Botterill, Senior Staff Specialist Forensic Pathologist, was asked to review the information available to the court about Mr Olsen's diagnosis, treatment and death as well as concerns raised by Mr Olsen's family about the

cause of death. Having reviewed the information, Dr Botterill was asked provide an opinion about the medical cause of Mr Olsen's death.

[136] Dr Botterill's expert opinion was that "a more all-inclusive (and thus less specific) cause of death formulation incorporates some of additional concerns expressed by the family, and is a more honest assessment of the uncertainty about the exact specifics involved in the pathophysiological progression to death." He considered that the cause of Mr Olsen's death was most accurately expressed as: disease or condition directly leading to death: 1(a) colonic adenocarcinoma and its treatment. I accept Doctor Botterill's opinion.

[137] Having regard to the evidence, I make the following findings:

Who the deceased person is:	the identity of the deceased is Jeffrey Stewart Olsen, born 19 December 1955.
How he died:	Jeffrey Olsen died after commencing adjuvant chemotherapy with capecitabine for treatment of Stage III colorectal cancer chemotherapy. Within three days of commencing capecitabine, Mr Olsen began to experience serious side effects consistent with capecitabine toxicity. Despite ceasing treatment with capecitabine, and extensive medical intervention, Mr Olsen's wellbeing rapidly deteriorated. He succumbed to what was likely to be capecitabine toxicity 14 days after commencing chemotherapy treatment.
Date of death:	6 October 2020.
Place of death:	Cairns Hospital, 165 Esplanade, CAIRNS QUEENSLAND AUSTRALIA 4870
Cause of death:	The medical cause of Mr Olsen's death is colonic adenocarcinoma and its treatment.

Section 46 comments

[138] The circumstances in which Mr Olsen died compel the conclusion that DPD enzyme deficiency screening and timely results ought to be available to all Queenslanders, including those living regionally.

[139] Between 2020 and the inquest in November 2024, and between the hearing and June 2026, there have been a series of material changes regarding DPD enzyme deficiency testing.

[140] Version 5 of the eviQ DPD enzyme deficiency guideline was introduced on 28 September 2020. At 28 September 2020, the guideline recorded that "DPD deficiency can be investigated by DPYD genotyping and measuring the DPD phenotype ... . Both tests are available in Australia, however, they are currently not reimbursed and the cost and turnaround times may be limiting factors in testing upfront." Version 5 did not expressly recommend that clinicians should discuss DPYD gene testing with all patients.

[141] At the time of hearing in November 2024, DPD deficiency testing was still not funded by Medicare and was not offered routinely to all patients in the public sector health system.

[142] The relevant eviQ DPD enzyme deficiency guideline was version 6. Version 6 noted that barriers to routine testing on all patients persisted but recommended "clinicians should discuss DPYD gene testing with all patients who are going to start fluoropyrimidines, with the decision to conduct testing made between the clinician and the patient". It also contained dose recommendations depending on DPYD test results.

[143] As at the time of the hearing there had been:

(a) developments in the understanding of which genetic test should be undertaken;

(b) developments in how chemotherapy dosing should be adjusted depending on the results;

(c) an increase in the number of laboratories doing the tests;

(d) a number of clinical studies looking at the testing; and

(e) an increase in the oncology community about testing.

[144] Dose recommendations were introduced into the eviQ guidelines in 2023. Being able to correlate dose with the DPYD gene variation a person has is important because, as the court heard, in many cases capecitabine is so critical to a treatment regime that modifications will still be made so that it can be used, even where there is a greater chance of a severe toxic reaction.

[145] The expert evidence was that "DPD testing should be made widely available in Australia and should be publicly funded - while there is an antidote available the cost of and the accessibility to the antidote mean that it is not readily available."

[146] By the time the inquest commenced, medical oncology practice had changed so that DPD enzyme testing was regularly discussed with patients, however the actual uptake of testing was "extremely poor". Regional cancer centres still faced delays in turnaround times for test results. Consequently, in 2024, testing risked delaying and adversely affecting the chemotherapy treatment of high-risk cancers.

[147] I accept the expert opinion that Mr Olsen's case highlighted the urgent need to make DPD enzyme testing and timely results widely and easily available by the government.

[148] In 2022, in the investigation stage of the inquest, MOGA's then chair, Dr Deme Karikios, expressed the view that routine DPYD testing should be publicly funded. Dr Karikios advised:

> Despite these barriers [*to routine DPD enzyme testing*] and ongoing controversy about the utility of DPYD testing, MOGA is of the view that routine DPYD testing in Australia should be publicly funded so that prescribers of fluoropyrimidines can discuss the option of testing with their patients. The main limiting factor in making this recommendation at this time is that it is not universally funded and, therefore cannot be realistically or equitably implemented in our health system.

[149] The evidence was that in 2024, more providers were offering DPYD testing than previously, albeit privately, and that there had been an increase in awareness among medical practitioners that testing was available.

[150] Access to DPYD testing was not subsidised under the Medicare Benefits Schedule (the MBS) at the time of the hearing, however an application had been made by the Royal College of Pathologists to the Medical Services Advisory Committee (MSAC) for consideration to be given to publicly funding "DPYD genotyping to predict fluoropyrimidine-induced toxicity", which application was in evidence. The application states that identifying patients who are variant carriers prior to fluoropyrimidine exposure allows for pre-emptive dose reduction, improving patient tolerance and safety and reducing hospital-related management incidents.

[151] By chance, MSAC was considering the application on the final day of the inquest hearing. The MSAC Chair was careful to explain to the court however, that MSAC is an advisory body not a decision making body and that funding decisions did not necessarily flow from its advice.

[152] The passage of time has made it apparent that MSAC did support MBS funding for DPYD genotyping at its meeting in November 2024, including so that the proposed patient population included patients currently undergoing or who have previously received fluoropyrimidine-based treatment.

[153] On 1 November 2025, a new item for DPYD genotyping to diagnose or predict fluoropyrimidine-induced toxicity was added to the MBS. A publicly available MBS factsheet states:

> Patients with solid tumours who are about to commence, are undergoing or had a treatment protocol that includes an FP treatment will be able to access Medicare benefits for the test to diagnose or predict FP-induced toxicity. This will subsequently enable clinicians to adjust a patient's FP treatment dose or select an alternative treatment.

[154] While version 6 is still the current version of the eviQ DPD enzyme deficiency guideline and the recommendation section with respect to testing has not been updated, a note has been added to the beginning of the document in a breakout box styled as alerts. The first alert relates to the risk of overdose or overexposure to fluoropyrimidines. The second alert advises the reader that DPYD genotyping was added to the MBS on 1 November 2025 and has links to further information. It is apparent from the history of version 6 that the guideline was amended on 20 November 2025 to note the addition of the test to the MBS and that "Updates have also been made to the Dihydropyrimidine dehydrogenase (DPD) enzyme deficiency clinical information and the Fluoropyrimidine overdose or overexposure warning flag across all fluoropyrimidine containing protocols to reflect this change."

[155] Since 1 November 2025, DPD deficiency screening has been publicly funded and nationally accessible for patients who will be commenced on, or are on, chemotherapy with fluoropyrimidines whose DPD deficiency status is unknown. It is acknowledged that a large amount of advocacy work was directed towards this change by various bodies including the Royal College of Pathologists and MOGA.

[156] Today, a person in Mr Olsen's position pre-chemotherapy treatment , would be counselled to have DPYD genotype testing, they would be able to access testing publicly, and their treatment would be informed by knowledge of whether they had a DPD enzyme deficiency. This is a significant change to the circumstances that Mr Olsen was in, in 2020.

[157] In the circumstances, the need for me to make any recommendation with respect to the accessibility of DPD enzyme deficiency testing has been overtaken by this systemic public health change at the national level. I acknowledge that cancer

patients in regional Queensland still face delays in the receipt of test results which can have adverse consequences for their treatment and wellbeing.

Conclusion

[158] Mr Olsen's death was tragic and unexpected. It occurred in circumstances where his care and treatment for Stage III colorectal cancer, and subsequent suspected capecitabine toxicity, was appropriate.

[159] Since Mr Olsen's death there have been significant changes at a systemic level that have impacted medical oncology practice in Australia. Today, any recommendation that a patient commence adjuvant chemotherapy treatment with fluoropyrimidines, including capecitabine, and at what dose is informed by knowledge of a patient's DPYD gene variant status.

[160] Additionally, in cases of severe or life threatening capecitabine toxicity the antidote is now stored and quickly available in Australia. While access remains tightly controlled and expensive, the time within which a hospital can access it in Australia has markedly improved since October 2020. Given the time of commencing the medication is critical, this is a significant change at a systemic level.

[161] Mr Olsen was an extraordinary man to those who knew and loved him. He was the heart and soul of his family, their guide and protector. The love for him, and the impact of his loss, was palpable throughout the inquest. Mr Olsen's family spoke of their hope for meaningful change, so that other families would not experience the loss they have felt. Through this inquest, and the changes which have been made, Mr Olsen's legacy lives on.