

Centre for Community Child Health



# The Melbourne Children's Knowledge Translation and Research Impact Project

**FINAL REPORT:**  
A FRAMEWORK FOR ACTION

MAY 2017



## Acknowledgement

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## Preface

This is the final report and one of four publications resulting from The Melbourne Children's Knowledge Translation and Research Impact Project.

*The Melbourne Children's Knowledge Translation and Research Impact Project. Final Report: A Framework for Action.* Leone, V., Modica, L., & West, S. (2017). The Melbourne Children's Knowledge Translation and Research Impact Framework, and the findings and recommendations in the Final Report are based on an analysis of the Discussion Paper, Environmental Scan and Consultation Report. This data was supplemented and informed by internal and external review throughout the Project. The Framework is applied to selected campus knowledge translation case studies, and key findings and recommendations propose action to enhance knowledge translation and research impact at Melbourne Children's.

*The Melbourne Children's Knowledge Translation and Research Impact Project. Consultation Report: Perceptions of Knowledge Translation and Research Impact.* Fong, M., Rushton, S., & West, S. (2016). The Consultation Report summarises data collected from:

- external experts via semi-structured interviews based on their expertise in research translation, research impact and knowledge of the policy and funding environments [n= 8, approx. 60 minutes each]
- campus leaders via semi-structured interviews [n=14, approx. 40 minutes each]
- campus staff via an online survey [n=109 fully completed]. Survey respondents worked in the following areas of Melbourne Children's:
  - 78 respondents worked in research
  - 33 respondents worked in clinical care
  - 30 respondents worked in education and training
  - 12 respondents worked in other areas including administration, service provision, knowledge translation, evaluation, policy, public affairs and coordination.

The consultations captured a range of perspectives about the prevailing funding environment, knowledge translation, key considerations, and opportunities and challenges for advancing research impact.

*The Melbourne Children's Knowledge Translation and Research Impact Project. Discussion Paper: Considerations for Knowledge Translation and Research Impact at Melbourne Children's.* Moore, T., Heiden, T., Leone, V., & West, S. (2017). The Discussion Paper identifies evidence and best practice in health and medical research translation. It seeks to align key concepts with the broader vision and strategy of the Melbourne Children's by addressing the following questions:

- How are research translation and knowledge translation defined?
- What are the core concepts of knowledge translation?
- What is the relationship between knowledge translation and research impact?
- Where does research impact fit within the context of Melbourne Children's?
- What impact measurement framework will help us understand and conceptualise knowledge translation and inform our approach to enhancing and measuring research impact?

*The Melbourne Children's Knowledge Translation and Research Impact Project. Environmental Scan: Implications of the External Environment for Knowledge Translation and Research Impact at Melbourne Children's.* Heiden, T., Leone, V., & West, S. (2017). The Environmental Scan captures the changing landscape of research policy and funding in Australia. It identifies four relevant consultation and review processes, and their potential implications for Melbourne Children's.

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## ABBREVIATIONS

ARC	Australian Research Council
CAHS	Canadian Academy of Health Sciences
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CIHR	Canadian Institutes of Health Research
KT	knowledge translation
MCRI	Murdoch Childrens Research Institute
MRFF	Medical Research Future Fund
NHMRC	National Health and Medical Research Council
RCH	The Royal Children's Hospital, Melbourne
RCHF	The Royal Children's Hospital Foundation
RI	research impact
UMDP	University of Melbourne Department of Paediatrics.

## Executive summary

In a health context it is effective knowledge translation that transforms research into prevention, early intervention, better treatment, informed policy and practice, and improved health and wellbeing. For Melbourne Children's it lies at the heart of our ability to make a difference for children.

However, the failure to translate research into practice and policy has been a consistent finding of clinical and health services research (Grimshaw, Eccles, Lavis, Hill & Squires, 2012). With growing interest in how to optimise the impact of research and minimise resource waste, the Melbourne Children's Knowledge Translation and Research Impact Project (the Project) was established to consider how to build the capacity of the campus to effectively support and enhance the translation of knowledge into practice and policy, and optimise the impact of research.

Melbourne Children's is the collaboration between The Royal Children's Hospital (RCH), the Murdoch Children's Research Institute (MCRI), the University of Melbourne, Department of Paediatrics (UMDP) and The Royal Children's Hospital Foundation (RCHF). Based in Melbourne's Parkville precinct, the campus unites leaders to advance child and adolescent health through the integration of prevention and early intervention, clinical care, research, education and training, and academic leadership.

The Project supports the campus mission of improving the health and wellbeing of children. It aligns with strategic priorities to increase the translation of research into practice, support multidisciplinary research excellence, develop a national and international reputation for leadership in health research, and grow our collaborative research efforts. With a more robust understanding of what it takes to optimise research impact at Melbourne Children's, the campus is better equipped to develop a strategy to advance knowledge translation and research impact, and enrich the health and wellbeing of children.

The Project drew on evidence from the literature, international practice, consultations with campus leaders and staff, and advice from international and Australian knowledge translation and research impact experts to understand the nature of knowledge translation and research impact. The Project sought to identify factors that could strengthen and build a consistent and effective approach to supporting knowledge translation, evidence-based care and optimising research impact for Melbourne Children's.

Achieving research impact is a dynamic and complex process affected by interactions, relationships and systems. Researchers, clinicians, educators, stakeholders, campus leaders and knowledge users all have a role in maximising impact. The Project:

- identified four organisational enablers of knowledge translation and research impact
- identified seven facilitators of knowledge translation and research impact
- devised the Melbourne Children's Knowledge Translation and Research Impact Framework (the Framework)
- applied the Framework to four existing projects
- formulated recommendations to advance knowledge translation and research impact for Melbourne Children's.

### Organisational enablers

Four organisational enablers were identified as critical for advancing knowledge translation and research impact at Melbourne Children's:

1. an organisational culture that values knowledge translation: the shared assumptions, values and behaviours on campus
2. organisational capacity for knowledge translation: the ability of the campus to utilise its resources
3. individual competency in knowledge translation: the skills of campus staff
4. collaboration: working with each other and knowledge users to advance impact (Moore, Heiden, Leone, & West, 2016).

The organisational enablers were used to analyse the project data. Potential strengths, weaknesses, challenges and opportunities for advancing knowledge translation and research impact at Melbourne Children’s were identified for each domain.

## Facilitators of effective knowledge translation and research impact

Seven facilitators of effective knowledge translation and research impact were identified in the course of the Project: leadership; shared terminology; alignment with national and international funding and practice; incentives; skills, tools and resources; engagement and collaboration; and impact measurement.

## Melbourne Children’s Knowledge Translation and Research Impact Framework

The conceptual model depicted in Figure 1, the Melbourne Children’s Knowledge Translation and Research Impact Framework (the Framework), was devised as a part of this project. The Framework incorporates the organisational enablers, outlines the pathway to impact, and maps to research impact domains. It provides the foundation for a consistent and effective approach to supporting knowledge translation, evidence-based care and research impact while recognising that achieving impact is a dynamic and complex process.

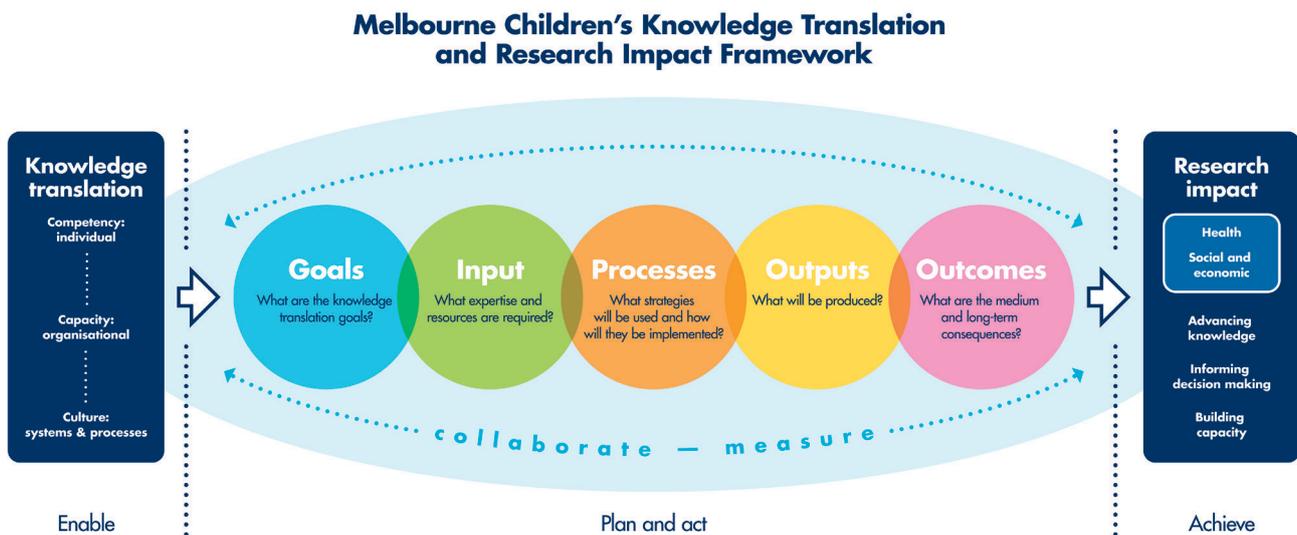


Figure 1: Melbourne Children’s Knowledge Translation and Research Impact Framework (impact categories adapted from the Canadian Academy of Health Sciences, 2009).

The Framework is designed to support the campus vision of optimising children’s health and wellbeing by:

- assisting in knowledge translation planning and the identification of pathways for accelerating and measuring research impact
- encouraging thinking about, planning for, and the measurement of, knowledge translation and research impact
- building understanding of the relationship between research: aims; activities; outputs; and anticipated impact to enable consideration of how, where and why impact may occur
- establishing a shared vision of research impact and innovation to advance the strategic goals of campus partners.

The Framework builds on a traditional logic model to establish a pathway to impact. It is a tool to assist in turning a generic pathway into a specific pathway to impact. Its application to four case studies is included in this report.

## Findings and recommendations

The findings and recommendations from the Project align with the seven identified facilitators of effective knowledge translation and research impact: leadership; shared terminology; alignment with national and international funding and practice; incentives; skills, tools and resources; engagement and collaboration; and impact measurement.

- 1. Leadership** – the strengths and achievements of Melbourne Children’s mean it is well placed to harness existing capacity and optimise engagement, knowledge translation and research impact. Knowledge translation is a growing research field and practice speciality with the potential for further development. There are opportunities for leadership in knowledge translation and research impact both within and beyond the campus.

### Recommendations:

- 1.1 Melbourne Children’s recognise and support the role of knowledge translation in advancing research impact, clinical care and education.
  - 1.2 MCRI pilot the application of the Melbourne Children’s Knowledge Translation and Research Impact Framework developed through this project with selected research teams to determine its applicability to advancing planning and impact, with a particular focus on translation in the clinical setting of RCH.
  - 1.3 MCRI monitor, evaluate and report on the application of the Framework and its effectiveness in facilitating research impact.
  - 1.4 MCRI engage with the University of Melbourne to understand the implications of the Australian Research Council Engagement and Impact Assessment pilots for Melbourne Children’s.
  - 1.5 Campus partners review the strengths, weaknesses, challenges and opportunities identified in the Project to inform the development of strategies to advance knowledge translation and research impact.
  - 1.6 Campus partners identify how processes and systems can be enhanced to encourage and enable staff to value and articulate impact.
- 2. A shared understanding of key terms** – there is wide variation in the terminology and concepts used to describe knowledge translation and research impact. The multiplicity of terms creates confusion and distracts from common action to advance knowledge translation. Establishing and applying a shared understanding of key terms will assist in planning for impact, progressing research impact strategies, and ensuring that the expectations of funders and researchers are aligned.

### Recommendations:

- 2.1 Campus partners apply and promote the Melbourne Children’s Knowledge Translation and Research Impact Framework developed through this project to build a shared understanding of knowledge translation and research impact.
- 2.2 Campus partners adopt the following definitions of knowledge translation and research impact:

**Knowledge translation** is the synthesis, exchange and application of knowledge by relevant stakeholders to accelerate innovation in improving children’s health and strengthening health systems (adapted from WHO, 2006).

**Research impact** is the demonstrable contribution that research makes to the economy, society, culture, national security, public policy or services, health, the environment, or quality of life, beyond contributions to academia (ARC, 2012).

## Melbourne Children's research impact categories (derived from CAHS, 2009)

- Health
- Social and economic
- Advancing knowledge
- Inform decision making
- Building capacity.

**3. Alignment with national and international funding and practice** – there is increasing national and international emphasis from funders on achieving, measuring and communicating research impact, however campus staff are primarily focused on outputs and traditional knowledge translation activities. Changes in the external environment will have an impact on funding for research and funding compliance, and consequently, activities on campus. Staying abreast of, and informing the changes where possible, will be important in the immediate future.

### Recommendation:

3.1 MCRI monitor and prepare for the changing funding environment to enable an agile campus response.

**4. Incentives for knowledge translation planning and research impact measurement** – incentives are required to build capacity for planning for and optimising research impact. Incentives for planning, knowledge translation, engagement and collaboration are likely to increase organisational capacity for research impact.

### Recommendations:

4.1 Campus partners incentivise and support the planning for, and capture and reporting of impact including, for example, staff awards for knowledge translation, and engagement and collaboration.

4.2 The Royal Children's Hospital Foundation develop systems to encourage and support grantees to articulate and report on their proposed impact pathway (including engagement, collaboration and measurement).

**5. Skills, tools and resources for effective knowledge translation** – staff have expressed interest in additional support and training to improve their skills to enhance the impact of their research. Currently there is a lack of common tools to support knowledge translation planning and the conceptualisation of pathways to impact. Resources and tools are required to provide support and guidance, build staff capacity for effective knowledge translation and research impact planning, and ensure that research is accessible and relevant to knowledge users. A shared approach to planning that prompts consideration of why, when, where and how impact may occur, and could be measured and communicated, would assist in achieving research impact. By establishing a pathway to impact, the proposed Melbourne Children's Knowledge Translation and Research Impact Framework could provide a common, unifying conceptual model.

### Recommendations:

5.1 Campus partners identify how processes and systems can be enhanced to encourage and enable staff to value and articulate impact.

5.2 Campus partners invest in the resources and research required to support and foster knowledge translation and optimise research impact at Melbourne Children's.

5.3 Campus partners invest in knowledge translation skills development for researchers including: training, tools, templates and resources.

5.4 Campus partners invest in the compilation and creation of digital knowledge translation tools and resources in a location accessible to all staff.

5.5 MCRI identify strategies for capturing and sharing learning to advance practice in knowledge translation and research impact.

- 5.6 MCRI review the performance evaluation case study requirements to capture more comprehensive information about what contributes to achieving impact.
- 5.7 Campus partners provide opportunities for internships or fellowships.

**6. Collaboration** – productive and effective relationships enable research impact. Staff currently undertake a range of activities to engage others with their work, however this engagement is dominated by a reliance on traditional outputs such as journal articles and academic presentations. There are many opportunities for encouraging professional exchanges to enhance the integration of knowledge into policy, programs and practice.

### Recommendations:

- 6.1 Campus partners identify and incentivise strategies for improving engagement and collaboration to optimise research impact.
- 6.2 Campus partners build understanding among researchers of the role of engagement and collaboration in achieving and measuring research impact, and support increased engagement activity (where appropriate).
- 6.3 Campus partners provide opportunities for training in collaboration and engagement.

**7. Impact measurement** – there is a growing need to measure the impact of research beyond the traditional academic measures. Responding to this demand for greater accountability would be facilitated by a shared approach to knowledge translation planning that prompts consideration of where and how impact may occur, and could be measured, and how data may be collected and communicated. Tools and resources that support tracking and collating data, and mapping to common research impact domains, may assist in measuring impact.

### Recommendations:

- 7.1 All research grant applicants be encouraged to articulate their proposed impact pathway (including engagement, collaboration and measurement).
- 7.2 MCRI review the performance evaluation case study requirements to capture more comprehensive information about what contributes to achieving impact.
- 7.3 MCRI identify time and cost-effective strategies for articulating and measuring research impact. Consideration should be given to compiling a library of indicators and metrics for use along the impact pathway and utilising tracking software (e.g. Researchfish, W-Impact Tracker) as a cost-effective means of collecting, measuring and communicating impact.

## Next steps

Delivering ongoing excellence in the provision of care to infants, children and adolescents requires an organisational culture that values knowledge translation, provides resources to enable knowledge translation, and prepares researchers and clinicians to engage in knowledge translation and report on the impact of those activities.

By identifying the organisational enablers (culture, capacity, competency and collaboration), a planning pathway, and facilitators of impact, the Melbourne Children's Knowledge Translation and Research Impact Project provides a foundation for the development of a campus strategy to facilitate knowledge translation and optimise research impact.

The common pathway for accelerating impact for Melbourne Children's outlined by the Framework will assist in establishing a shared vision of research impact and innovation, and encouraging consideration of how, where and why impact may occur to support more effective planning, measurement, and communication of knowledge translation and research impact.

The Report concludes that further work is required to operationalise the Framework and develop a more comprehensive, collaborative and consistent approach to advancing research impact at Melbourne Children's. This requires campus partners working together to build organisational enablers, establish a plan for action consistent with the facilitators, and apply the Framework to determine its capacity to facilitate research impact and:

- increase the speed and efficiency of the application of research | ACCELERATION
- increase the accessibility of research | ACCESSIBILITY
- demonstrate responsible and effective use of funding | ACCOUNTABILITY
- increase the awareness of, and demonstrate the value of, research | ADVOCACY
- enable progress towards impact be monitored and inform the future allocation of resources | ALLOCATION
- enable understanding of the reasons for the success or failure of research impact | ANALYSIS (adapted from Guthrie, Wamae, Diepeveen, Wooding & Grant, 2013).

The Project Team will finalise a plan of action with campus partners and commence pilot work with select research teams over the next three years (2017-2020). Research teams will be provided with tools and resources including training and coaching support. The pilot will assist campus partners to build understanding of the processes identified in the Framework and inform the development of a coherent campus approach to advancing research impact. The project will pilot the Framework as a foundation for a knowledge translation and research impact strategy, and test its applicability to the campus and its ability to harmonise the Melbourne Children's approach with emerging changes at a national level to enhance and accelerate impact.

## Introduction

Melbourne Children's is the collaboration between The Royal Children's Hospital (RCH), the Murdoch Childrens Research Institute (MCRI), the University of Melbourne, Department of Paediatrics (UMDP) and The Royal Children's Hospital Foundation (RCHF). Based in Melbourne's Parkville precinct, the campus unites leaders to advance child and adolescent health through the integration of prevention and early intervention, clinical care, research, education and training, and academic leadership.

The Melbourne Children's Knowledge Translation and Research Impact Project (the Project) began in March 2016. Funded by the RCHF, it sought to understand how to optimise research impact on campus by: identifying the factors that enable research impact; documenting the changing external environment; and capturing the experience of those undertaking knowledge translation to advance research impact.

This project supports the campus mission of improving the health and wellbeing of children through leadership in healthcare, research and education. It aligns with strategic priorities to increase the translation of research into practice, support multidisciplinary research excellence, develop a national and international reputation for leadership in health research, and grow our collaborative research efforts.

## Project components

The Project comprised several key inputs: a review of literature and practice, external and campus consultation, an environmental scan and case studies (see Figure 2). These components profile:

- the changing external policy affecting the environment in which research is undertaken [Environmental Scan]
- advice and input from experts and external stakeholders [Consultation Report: external interviews]
- advice and input from campus leads [Consultation Report: campus interviews]
- advice and input from staff [Consultation Report: campus survey]
- concepts of knowledge translation and research impact and their implications for Melbourne Children's [Discussion Paper]
- evidence and best practice in health and medical research translation [Discussion Paper]
- selected campus knowledge translation projects [case studies].

These were supplemented with expert advice from an internal reference group, external expert panel, and an expert advisor. This material provides the foundation for the conceptual framework developed as a part of this project: the Melbourne Children's Knowledge Translation and Research Impact Framework (the Framework).

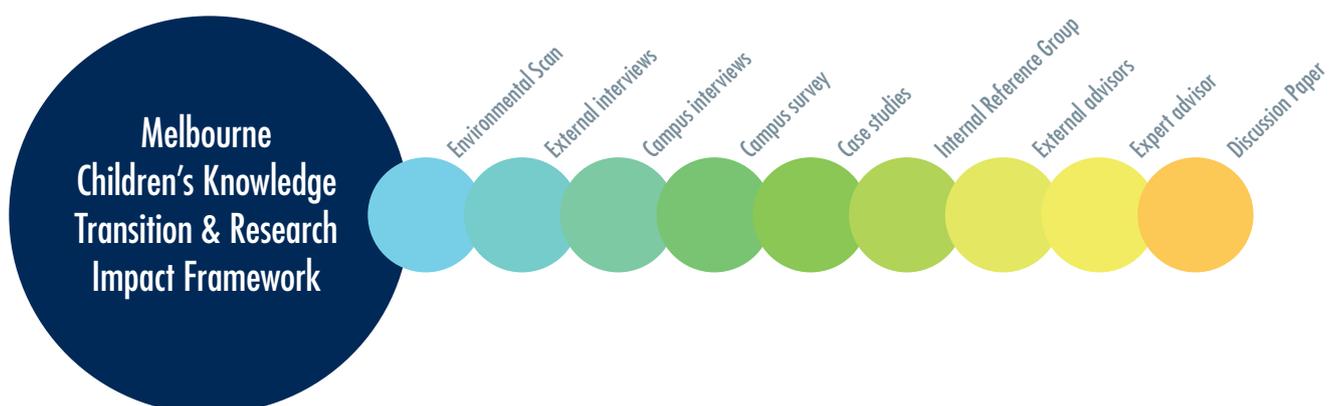


Figure 2: Components contributing to the Melbourne Children's Knowledge Translation and Research Impact Project.

## Drivers of research impact

While there are numerous examples of outstanding innovation and excellence in knowledge translation and research impact from Melbourne Children's over many years – and a strong performance evaluation history that captures case studies of impact over the last decade – the Melbourne Children's Knowledge Translation and Research Impact Project sought to determine what is required to develop the capacity of the campus to:

- increase the speed and efficiency of the application of research | ACCELERATION
- increase the accessibility of research | ACCESSIBILITY
- demonstrate responsible and effective use of funding | ACCOUNTABILITY
- increase the awareness of, and demonstrate the value of, research | ADVOCACY
- enable progress towards impact be monitored and inform the future allocation of resources | ALLOCATION
- enable understanding of the reasons for the success or failure of research impact | ANALYSIS (Guthrie et al., 2013). See Figure 3, *Drivers of research impact*.



Figure 3: Drivers of research impact [adapted from four rationales for research evaluation, Guthrie et al., 2013].

To build understanding of what enables research impact and how to advance, optimise and capture stories of research impact on campus, the Project addressed six key questions:

1. What is knowledge translation and research impact, and why do they matter?
2. What facilitates or impedes achieving research impact?
3. How is the research funding environment changing in Australia?
4. What are the strengths and limitations of our current approach?
5. What are the barriers and enablers to doing better?
6. How can knowledge translation and research impact be optimised on campus?

## Governance

The Project was undertaken by a team from the Centre for Community Child Health under the direction of Sue West, Group Leader, Policy, Equity and Translation, MCRI, and Associate Director of the Centre for Community Child Health, with support from by Professors Katie Allen, Frank Oberklaid and Sharon Goldfeld. See Figure 4 for governance details.



Figure 4: Project Governance.

# Defining knowledge translation and research impact

In a health context it is effective knowledge translation that transforms research into prevention, early intervention, better treatments, and informed policy and practice for improved health and wellbeing. For Melbourne Children’s it lies at the heart of our ability to make a difference for children.

The many varied definitions of knowledge translation and research impact can be distracting and confusing. Clarifying key terms and establishing a shared campus vision is fundamental to advancing research impact: the consistent application of terminology is necessary for building a common understanding that underpins campus strategy. These issues are explored more fully in the Discussion Paper by Moore et al. (2017).

While the term ‘research translation’ was used at the commencement of this project it became evident during the consultation process and in the development of the Discussion Paper, that it provided a narrow interpretation of translation that failed to fully encompass the breadth of knowledge translation aims or goals including sharing evidence, building awareness, building knowledge and facilitating behaviour, practice or policy change, or commercialisation (Barwick, 2008, 2013).

Research translation also fails to encompass the diverse range of knowledge forms blended from different sources that inform decision making in evidenced-based practice (Greenhalgh & Wieringa, 2011) as knowledge is conceptualised differently in different fields (Moore et al., 2017).

The five sources of knowledge identified by Pawson, Boaz, Grayson, Long and Barnes (2003) acknowledge the value of diverse sources of knowledge and supplement an exclusive reliance on research knowledge (see Table 1).

Table 1: Sources of knowledge.

## SOURCES OF KNOWLEDGE

**Research knowledge** – held by researchers

**Practice knowledge** – held by practitioners

**Experiential knowledge** – held by parents and communities

**Organisational knowledge** – held by service system organisers

**Policy knowledge** – held by policy makers (Pawson et al., 2003).

Empirical knowledge is a significant part of the campus’ knowledge base, however the use of ‘research translation’ as a means of describing the process of moving knowledge into action limits the conceptualisation of ‘evidence’ by omitting other types of knowledge.

Adopting a richer and wider conceptualisation of knowledge not only recognises the nuanced nature of decision making, but also the importance of access to different types of knowledge by researchers, policy makers, practitioners, parents, and patients (Waddell et al., 2005). ‘Knowledge translation’ more comprehensively encompasses diverse forms of knowledge and is an internationally recognised and more widely-applied term.

Despite widespread use of the concept however, there is no single definition of knowledge translation. It has become an umbrella term to describe the movement of research into action (policy, programs and practice) encompassing a range of terms (with subtle variations) that include knowledge transfer and knowledge exchange, research translation, knowledge mobilisation and research utilisation (Graham et al., 2006; Ward, House, & Hamer, 2009a).

For the purposes of this project, the World Health Organisation (WHO) definition of knowledge translation and the Australian Research Council (ARC) definition of research impact were adopted (see Table 2).

Table 2: Working definitions.

## WORKING DEFINITIONS

**Knowledge translation:** the synthesis, exchange, and application of knowledge by relevant stakeholders to accelerate the benefits of global and local innovation in strengthening health systems and improving people's health (WHO, 2006).

**Research impact:** the demonstrable contribution that research makes to the economy, society, culture, national security, public policy or services, health, the environment, or quality of life, beyond contributions to academia (ARC, 2012).

## Knowledge translation strategies

Knowledge translation strategies increase the likelihood that research will be of benefit to knowledge users. Two categories of knowledge translation are commonly identified: end-of-grant knowledge translation and integrated knowledge translation (Graham et al., 2006; McGrath, Lingley-Pottie, Emberly, Thurston, & McLean, 2009; Straus, Tetroe, & Graham, 2011). Knowledge synthesis also plays an important role in the application of research to policy, programs and practice.

### End-of-grant knowledge translation

**End-of-grant knowledge translation** involves strategies to disseminate or apply research findings occurring at the end of a grant cycle. This may include presentations and publications, and tailored messages for specific audiences such as workshops for clinicians or policy briefs for administrators (Graham et al., 2006). It may also include the development of products and services (commercialisation) based on research.

### Integrated knowledge translation

**Integrated knowledge translation** is an approach to undertaking knowledge translation that integrates the principles of knowledge translation throughout the entire research process. It recognises the importance of the ongoing engagement of stakeholders and knowledge users throughout the research process – from informing research questions to methodology, data interpretation and dissemination – as increasing the likelihood of the relevance and uptake of research findings (Bowen & Graham, 2013; Graham et al., 2006; Graham & Tetroe, 2009; Kothari & Wathen, 2013; McGrath et al., 2009; Riley, Glasgow, Etheredge & Abernethy, 2013).

### Knowledge synthesis

**Knowledge synthesis** plays an important role in the judicious application of research to policy, programs and practice. As knowledge synthesis aggregates knowledge, contextualising and integrating research findings within a larger body of evidence on a topic, it readies evidence for application. It recognises the cumulative nature of science and places research in a wider context to highlight evidence of efficacy, and inform decision making and the design and development of future research (Canadian Institutes of Health Research [CIHR], n.d.).

## Research impact

Definitions and understanding of the term ‘research impact’ are also subject to variation. The ARC definition in Table 2, the “demonstrable contribution that research makes to the economy, society, culture, national security, public policy or services, health, the environment, or quality of life, beyond contributions to academia” (ARC, 2012), aligns with an increasing focus by the Australian Government to both track and document the public benefit of research impact beyond academia.

The Project supplemented this definition by providing campus survey respondents with the Canadian Academy of Health Sciences impact categories: advancing knowledge, building capacity, informing decision making, health impacts, social and economic impacts (CAHS, 2009). These categories are defined in Table 3 Research impact categories.

Table 3: Research impact categories (derived from CAHS, 2009).

RESEARCH IMPACT CATEGORIES
<b>Advancing knowledge:</b> discoveries and breakthroughs; contributing to knowledge in the field (including quantity, quality and dissemination).
<b>Health impacts:</b> advances in the prevention; diagnoses and treatment (including health status, determinants of health, and health systems).
<b>Capacity building:</b> enhancing and developing the skills of researchers, individuals and teams.
<b>Informing decision making:</b> influencing evidence-informed decision making.
<b>Social and economic impacts:</b> broad social and economic effects including sales and revenue, social benefits and wellbeing.

# The significance of knowledge translation and research impact

## Maximising our impact

The inability to translate research into practice and policy has been one of the most consistent findings from clinical and health services research (Grimshaw et al., 2012), and the magnitude of the effort required to translate the findings from medical research into valid and effective clinical care is underestimated (Westfall, Mold, & Fagnan, 2007). This means both a failure to optimise the investment in research, and an increase in risk: “Failing to use available science is costly and harmful; it leads to overuse of unhelpful care, underuse of effective care, and errors in execution” (Berwick, 2003). Research from the USA, Canada and the Netherlands suggests that:

- 30-40 per cent of patients do not get treatment that has proven effectiveness
- 20-25 per cent of patients receive unnecessary or potentially harmful treatment (Graham & Tetroe, 2007)
- the average time lag in the translation of health research to practice is 17 years (Morris, Wooding, & Grant, 2011).

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*“Failing to use available science is costly and harmful; it leads to overuse of unhelpful care, underuse of effective care, and errors in execution”.*

Donald Berwick, 2003.

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It is likely that this wastage and variable care is similarly reflected in Australian health systems. It is estimated that approximately \$5.9 billion is spent on health and medical research in Australia each year (‘Aust. H&MR Research Facts’, 2016). Studies of Australian health care have identified shortfalls in treatment and disparities in standards of care. In an Australian study of more than 1000 patients, 43 per cent had received inappropriate or unnecessary care (Runciman et al., 2012). The challenge is to determine how to maximise the value of research and reduce wastage to optimise health and wellbeing.

While not all research evidence is ready for application, considerably more can be done to improve the effectiveness and efficiency of research and knowledge translation. This provides a strong rationale for strategic action on knowledge translation and research impact at Melbourne Children’s.

## Facilitators of effective knowledge translation and research impact

The Project identified seven factors with the potential to facilitate effective knowledge translation and research impact on campus including:

- leadership to support institutional change at Melbourne Children’s to accelerate knowledge translation activity and achieve greater impact from research (Fong, Rushton, & West, 2016)
- a shared understanding of key terms such as knowledge translation and research impact (Fong et al., 2016)
- alignment with national and international funding and practice (Heiden, Leone & West, 2017; Fong et al., 2016; Searles et al., 2016)
- incentives for knowledge translation planning and research impact measurement
- skills, tools and resources that build organisational capacity for effective knowledge translation, support planning for impact (Lavis, Robertson, Woodside, Mcleod & Abelson, 2003; Barwick 2008, 2013), tailoring knowledge for use (Campbell, 2012; Mitton, Adair, McKenzie, Patten & Perry, 2007), and understanding the context in which knowledge is applied (Cartwright, 2013; Damschroder et al., 2009)
- stakeholder engagement and collaboration (Campbell, Schryer-Roy, Jessani & Bennett, 2008; Greenhalgh & Wieringa, 2011)
- impact measurement – efforts to measure the extent to which proven interventions were adopted and whether they had the desired impact (Greenhalgh et al., 2016).

The findings and recommendations from the Project align with the seven facilitators.

## Leadership

It was widely acknowledged in the external consultations that institutional change takes time and requires leadership. Three areas of leadership emerged from the consultations as important for Melbourne Children's: leadership for cultural change; external leadership; and knowledge translation research leadership.

**Leadership for cultural change:** A strong message that emerged through the consultations with external advisors was that Melbourne Children's will require institutional leadership, including messaging about the value and importance of engagement and knowledge translation, to ensure it is prepared for a future where engagement, knowledge translation, and achieving and articulating impact from research are mainstream accomplishments.

**External leadership:** A second area of leadership identified by both campus leaders and external advisors is the contribution Melbourne Children's can make to the field. With ten years' experience of generating performance evaluation data including qualitative case studies, MCRI is relatively advanced compared to other research institutes in capturing data on research impact. This means MCRI is well placed to respond to changes in the sector and well positioned to provide leadership and advice.

**Knowledge translation research leadership:** The consultations identified the opportunity for Melbourne Children's to become a leader in knowledge translation research. With much diverse activity on campus, but limited evidence in this growing field, there is an opportunity to document and learn from current approaches as well as test and further develop best practice knowledge translation to advance impact.

## Shared understanding of key terms

Presently there is no consistent understanding of the concepts of 'knowledge translation' and 'research impact', or their application, on campus. The concepts are broad and open to interpretation, and the absence of a shared understanding is a barrier to effective discussion. This lack of common understanding was recognised as a challenge in both the campus and external consultations (Fong et al., 2016).

Establishing a common conceptual vocabulary would help to build a shared perspective. The campus survey identified that greater consensus about how impact is defined, a relevant framework to support planning for impact, and the development and provision of metrics to help define and measure impact, as beneficial to improving and maximising the impact of research. There was strong interest expressed in the provision of greater support to develop a better understanding of planning for impact.

For this project, campus survey respondents were provided with the Canadian Academy of Health Sciences (CAHS) impact categories: advancing knowledge, building capacity, informing decision making, health impacts, social and economic impacts (CAHS, 2009). These were drawn from the CAHS Research Impact Framework (see Figure 5) which incorporates the five impact categories into a logic model. The framework provides a structure to help users identify where to expect impact to occur, collect data (via a menu of preferred indicators and metrics) and track impact. It incorporates the Payback Framework (Buxton & Hanney, 1996).

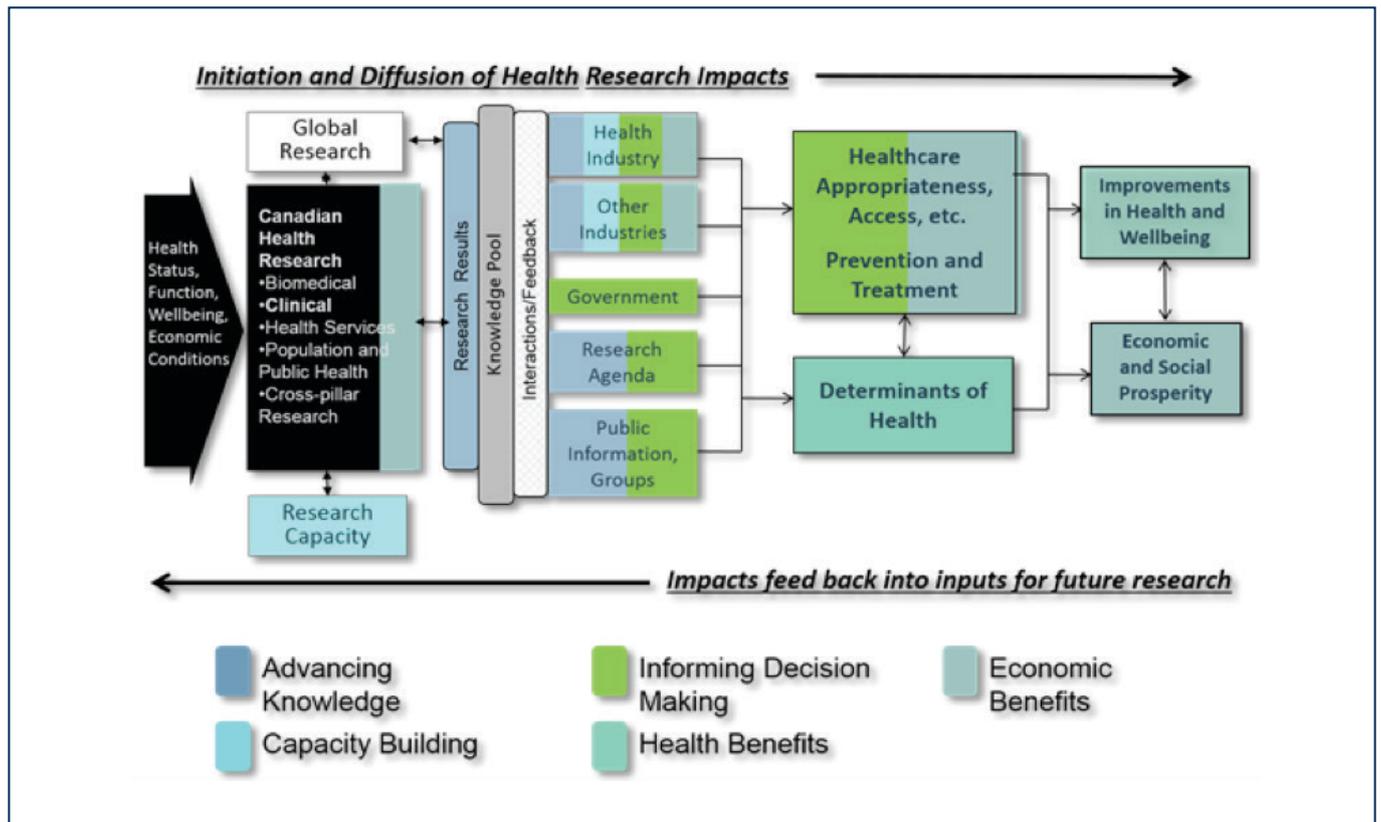


Figure 5: Canadian Academy of Health Sciences Research Impact Framework [biomedical example] (CAHS, 2009).

These impact categories were identified in the consultations as useful and compatible with campus goals. Campus respondents could successfully map their work against the domains suggesting that they comprehensively represent a range of impact areas relevant to Melbourne Children’s. Advancing knowledge, informing decision making and health impacts were the most commonly identified impact categories. See Figure 6 *Which of the following impact areas are relevant to your work?*



Figure 6: Which of the following impact areas are relevant to your work? (n=96). Source: Consultation Report, (Fong et al., 2016).

### Alignment with national and international funding and practice

The Australian research funding landscape is undergoing significant change with growing emphasis on how to identify and articulate research impact. The nature of these changes is captured in the Environmental Scan (Heiden et al., 2017). Increasingly research institutions are required to demonstrate that they are not only efficient producers of new knowledge, but that they are also able to facilitate the application of that knowledge for the benefit of society.

The National Innovation and Science Agenda (NISA) introduced by the Commonwealth Government in 2015, seeks to enable high-performing innovation, research and science. The measures in NISA draw on recommendations from the *Report of the Review of Research Policy and Funding Arrangements* (also known as the Watt Review, 2015) and aim to “strengthen Australia’s research system and to better translate research outcomes into economic and social benefits” (NISA, 2015). Strategies seek to increase funding, boost research engagement and impact, increase access to intellectual property for public benefit, and increase Australia’s rate of collaboration between industry and researchers – currently the lowest in the OECD at 2–3 per cent (NISA, 2015).

A component of NISA is an Engagement and Impact Assessment pilot to be undertaken by the ARC in 2017. At the November 2016 launch of the pilot, Minister for Education and Training Simon Birmingham stated, “This is about testing how we can measure the value of research against things that mean something, rather than only allocating funding to researchers who spend their time trying to get published in journals.” (*2017 pilot to test impact, engagement of researchers*, 2016).

This shift to mandate activities that link research to non-academic benefits is noted by Searles and colleagues (2016): “As funders increasingly seek to understand the return on their research investments, the routine measurement of research translation and research impact is likely to become mandatory rather than optional.”

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*“This is about testing how we can measure the value of research against things that mean something, rather than only allocating funding to researchers who spend their time trying to get published in journals.”*

Minister for Education and Training Simon Birmingham, 2016.

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The changing nature of the documentation and measurement of research translation and impact was consistently noted in the Project’s external consultations (Fong et al., 2016).

In the external consultations, participants identified that the nature of how knowledge translation and research impact has been valued, measured and supported has changed over recent years. They reported an increasingly competitive funding environment for research in Australia, and increased pressure from funders to demonstrate impact from research grants. Also noted was a greater focus from funding agencies (i.e. the ARC, the National Health and Medical Research Council [NHMRC] and the Medical Research Future Fund [MRFF]) on research impact, and the need to articulate the tangible societal benefits of research investments and activities, and identify how health outcomes are improving through the effective translation of research into practice. They also reported increased use of online systems – such as Researchfish, widely used in the UK – to capture and monitor research impact.

Recognition of this changing dynamic was also reflected in the campus consultations (Fong et al., 2016). Respondents noted that research impact and knowledge translation were increasingly valued and measured in Australia, resulting in a need for greater collaboration, capturing the impact achieved through the translation of research, and acknowledging the implications of this in a competitive funding environment. One campus leader observed, “These groups (government and philanthropy) don’t care about a good question. They don’t care how good or bad a question is scientifically or how good or bad the design is. They want to know that’s all good, but they care about impact and about the translation and about how it’s going to affect what they’re trying to achieve”.

These observations align with a greater international focus on articulating the benefits of research and collaboration from large funders, philanthropic and international development agencies and impact measurement systems such as the UK’s Research Excellence Framework.

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*“These groups (government and philanthropy) don’t care about a good question. They don’t care how good or bad a question is scientifically or how good or bad the design is. They want to know that’s all good, but they care about impact and about the translation and about how it’s going to affect what they’re trying to achieve”.*

Source: campus consultations, Fong et al. (2016).

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Campus consultations identified the highly competitive research funding system – particularly with an emphasis on outputs rather than impacts – as a barrier to achieving research impact. It was also widely acknowledged that how funders choose to measure research impact is likely to have a significant effect on the research process.

## Incentives for knowledge translation planning and research impact measurement

Rewards and incentives help to nurture a culture that values knowledge translation and impact. The significant influence of the reward structure on planning, measuring and reporting impact was recognised in the external consultations: incentivising knowledge translation and research impact was considered necessary to achieving impact. It was suggested that if funding bodies, organisations and academic institutes broadened their focus from research productivity and outputs to include recognising, funding and promoting knowledge translation and measuring impact, this would help to align and incentivise knowledge translation and enhance research impact (Fong et al., 2016).

Both the external and internal project consultations recognised the need for incentives to build capacity for planning for impact. It was acknowledged that institutional change takes time and that incentives for collaboration and knowledge translation planning could increase organisational capacity. External stakeholders cautioned that even though researchers might see the importance of planning and measuring research impact, the current reward structure in which they operate holds great influence. *“I’m 100% with the impact stuff... totally get it, but I’m not rewarded for that. I’m rewarded to write papers”* (Fong et al., 2016).

Respondents in the external consultations also identified missed opportunities for knowledge translation and impact including a research project audit indicating that: excellent research had not been shared with potential knowledge-user audiences; researchers worked in isolation and missed opportunities for collaboration on common work; and projects from the same institution were unwittingly engaging the same community partners (Fong et al., 2016). It's possible that similar factors could be affecting the ability of Melbourne Children's to achieve greater research impact.

The CSIRO incentivise planning for impact by integrating it into their operational strategy. Figure 7 depicts the CSIRO's Impact Framework (How CSIRO ensures it delivers impact, 2014) that outlines the process of research from input to impact. It is a logic model that supports the consistent planning, monitoring and evaluation of the impact of CSIRO research within three categories: economic, social and environmental.

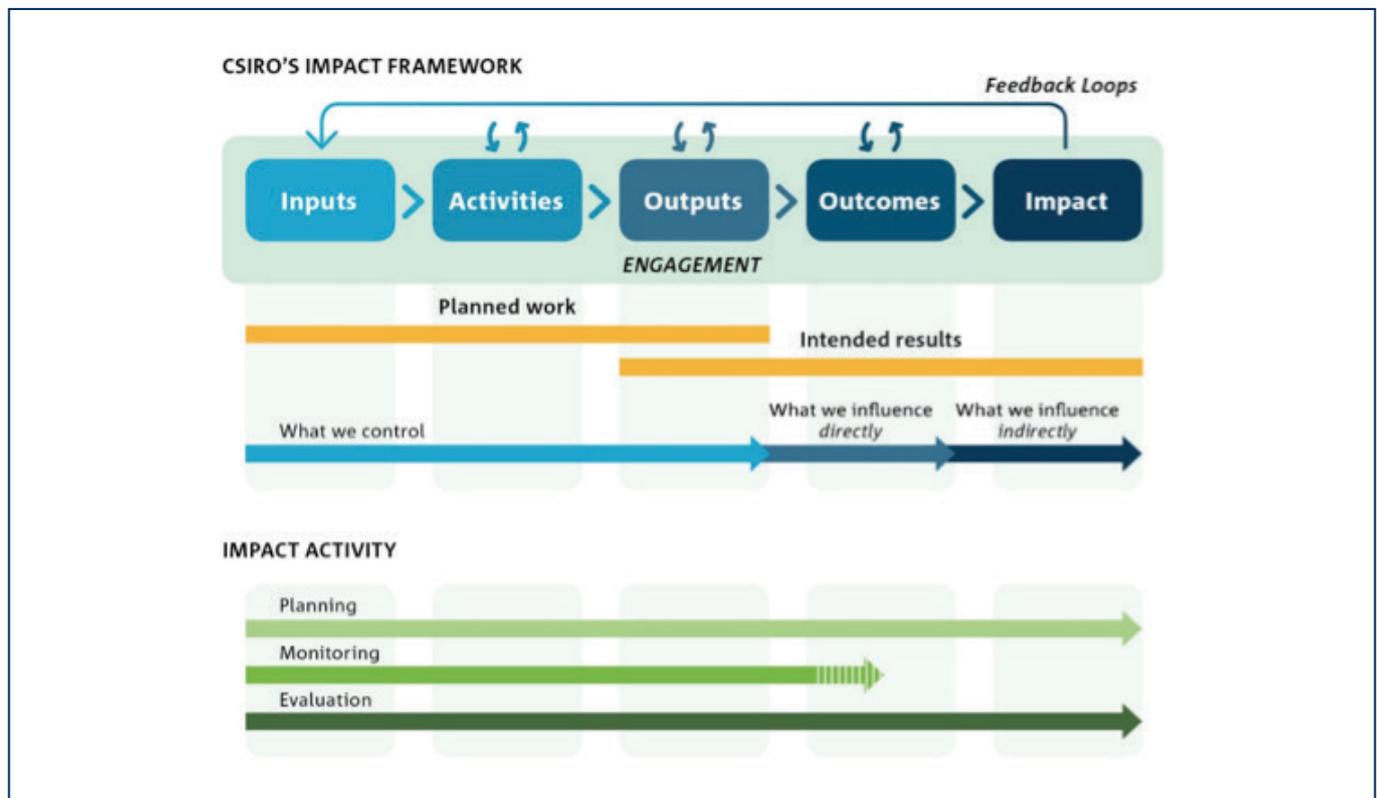


Figure 7: CSIRO's Impact Framework. (How CSIRO ensures it delivers impact, 2014).

CSIRO's approach to planning, monitoring and evaluating impact is built on the concept that, in order to assess the value of research, it must be possible to track the process from inputs to impacts. (How CSIRO ensures it delivers impact, 2014). It is the purpose and intended audience of the impact that determine the design of the impact evaluation. To ensure that impact management is understood, valued, prioritised and rewarded within the organisation, CSIRO has established an impact culture program that considers the 'people' aspects of how science is managed for impact. CSIRO incentivises its approach to impact planning, monitoring and evaluation by embedding it into: accountability requirements; capacity building; performance evaluation; and incorporating it into staff recruitment, induction and promotion.

## Skills, tools and resources for effective knowledge translation

To improve knowledge translation and research impact, staff need to be suitably resourced, and encouraged. This means providing the support, tools and resources required to build:

- understanding of knowledge translation as a pathway to research impact
- skills for effective knowledge translation including: making research accessible and relevant; developing contextual understanding; undertaking effective collaboration; and evaluating and communicating impact.

The need for training and resources to support knowledge translation was expressed in the campus survey. Survey respondents demonstrated a high level of interest in: the provision of support or knowledge translation training; the development and evaluation of research translation plans; the development of key messages; the identification of impact indicators; and plan implementation. See Figure 8 Level of interest in knowledge translation support or training.

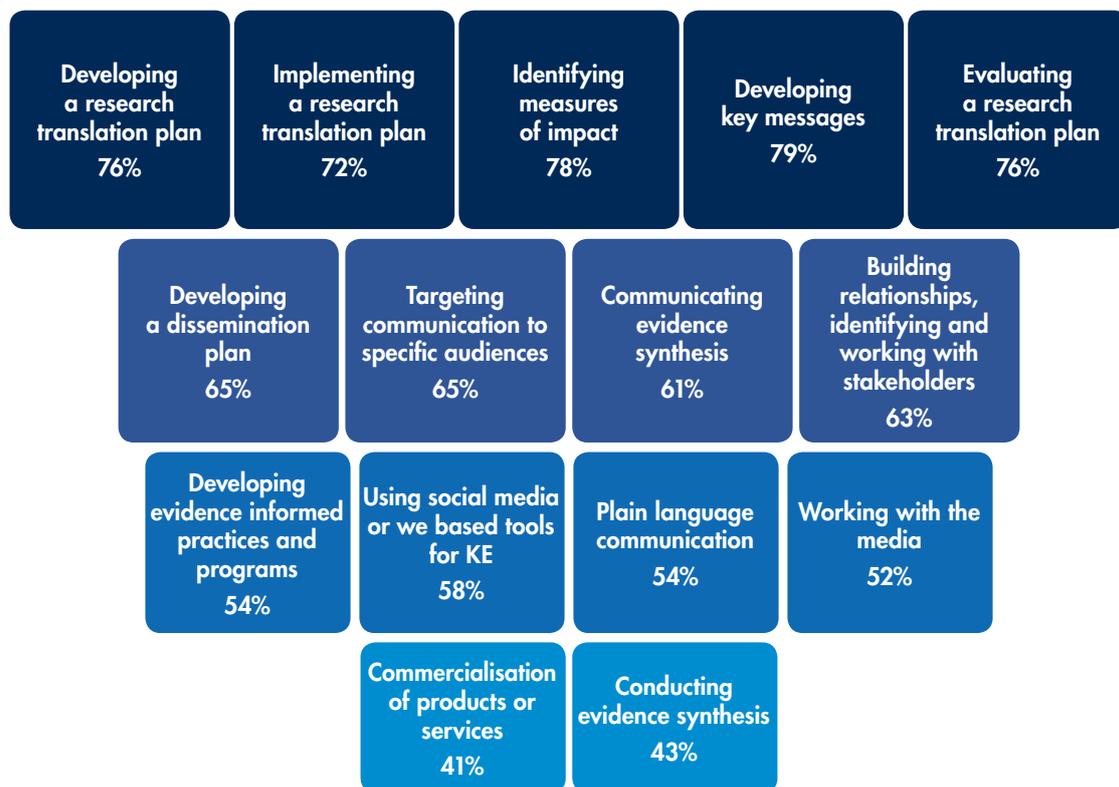


Figure 8: Level of interest in knowledge translation support/training (n=72). Source: Consultation Report (Fong et al., 2016).

Also reflected in the survey was a high level of interest in communication support or training including plain language communication, developing key messages and using media. Survey respondents identified the provision of dedicated funding and resources to support knowledge translation and establish clear pathways to impact, as a facilitator of impact. Consultation respondents identified the lack of readily available tools and frameworks as one of the most common barriers to translating research evidence and measuring and reporting on research impact.

Increasing access to knowledge translation tools and resources would provide opportunities for building skills, understanding, and greater capacity for effective knowledge translation and research impact.

A conceptual model that provides a framework for planning for impact could underpin these resources and their application. There was positive support for the development of a campus framework for knowledge translation and research impact activity from the campus consultations. It was considered helpful for articulating what was being done and why, and for informing a strategy to encourage knowledge translation and improve accountability. Advice from campus stakeholders indicated that a campus framework needed to:

- be adaptable and relevant to diverse groups
- prompt thinking about knowledge translation and research impact
- align with the requirements of key external funders
- accommodate different pathways to impact
- support high quality research
- value discovery and serendipity
- encourage collaboration
- incorporate co-design and feedback
- provide opportunities for sharing impact stories (Fong et al., 2016).

## Planning for impact

An impact pathway seeks to bring knowledge to life. The ARC identifies an impact pathway as “...an analysis or plan which identifies causal links by which research achieves or will achieve its impact” used by researchers and research planners to “identify hypotheses about the route from research-specific activities, through to uptake and adoption of research outputs, and the realisation of subsequent future intended impact(s). This includes defining the changes and linking processes, and indicators to measure progress towards intended impact(s)” (ARC, 2015).

Knowledge translation skills, resources and tools provide the foundation for building a pathway to impact. Building knowledge translation capacity and competency facilitates planning and helps to optimise impact by encouraging the development of strategies for improving the use of research and ensuring its accessibility and relevance to maximise its application and sustainability. See Figure 9 Building the pathway to impact.

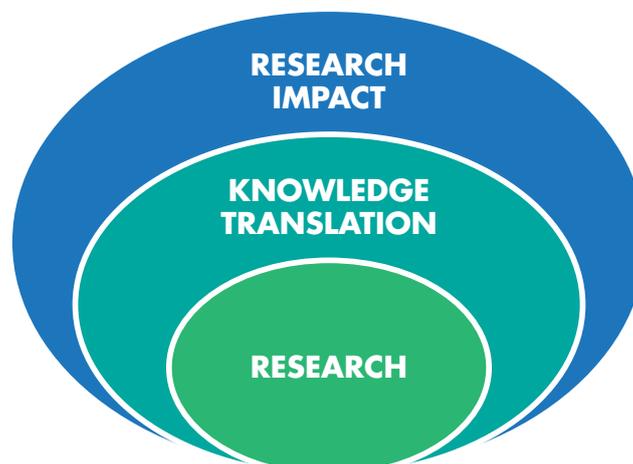


Figure 9: Building the pathway to impact.

However, charting a pathway towards impact can be challenging: the values that influence decision making emerge from a complex interaction of interests with beliefs and ideologies expressed through individuals and organisations (Lomas, 1997).

While impact may not follow a predictable pathway, knowledge translation planning aims to accelerate and broaden the use of research by establishing clear expectations of intended impact at the outset. It aims to advance research impact by considering how progress will be monitored, prompting the collection of appropriate data for evaluation, and the consideration and recognition of intended and serendipitous outcomes.

Planning should seek to:

- articulate the problem or need. What is the need that is being addressed?
- identify the knowledge translation aim or goal. What are the intended benefits of the knowledge translation activities?
- identify, engage and understand the needs and interests of research users and key stakeholders. Who are the stakeholders and knowledge users?
- understand the context in which the work sits. What are the prevailing political, economic, social, technological, legal or environmental influences?
- determine how the plan will be resourced and the appropriate knowledge translation strategies. What knowledge translation strategies will be used?
- consider how the plan will be monitored and evaluated. What are the intended benefits of the knowledge translation activities? What data should be collected and who should collect it? (Barwick, 2008, 2013; CIHR, 2012; Lavis et al., 2003).

Planning should be flexible and adaptable, accommodating change as the research process evolves.

Knowledge translation planning, action and reporting has become an integral part of research funding programs in Canada. The Canadian Institutes of Health Research (CIHR) is recognised for its leadership in knowledge translation theory and funding models. The CIHR requires progress reports that align with key performance areas and articulate project activities, outputs and outcomes to track impact.

The consultations indicated that limited knowledge translation planning is occurring at Melbourne Children's: few campus stakeholders indicated that they planned for impact at the outset of projects. Those that had, reported independently developing logic models and evaluation strategies to document progress and impact.

### **Tailoring knowledge and understanding context**

To make evidence-informed decisions, policy makers, practitioners and parents need access to the research knowledge developed and held by the research community. However, this knowledge is not always easily accessible or written in a way that is easily understood.

Tailoring messages to fit the needs and knowledge base of particular audiences increases the chances of the research evidence being understood and utilised (Campbell, 2012; Mitton et al., 2007; Phipps, Krista, Jensen & Myers, 2012). Communications that convey research in plain language help to ensure that readers can find, understand and use the information to meet their needs.

To achieve this requires some understanding of the context in which the information is going to be used (Mitton et al., 2007). Context refers to the physical and operational environment of the knowledge user – the organisational decision-making processes, structures of power or authority, and available resources (Sudsawad, 2007).

The Research to Action model (Graham et al., 2006) highlights the processes of adaptation, implementation, monitoring, and sustainability – recognising the characteristics that affect decision making (see Figure 10). These processes require both an understanding of context and the adaptation of the evidence for the audience (Phipps et al., 2012). Knowledge translation strategies must involve the tailoring of not only the knowledge but the timing, setting and format of dissemination for each audience (Greenhalgh & Wieringa, 2011; Mitton et al., 2007; Lomas, 1997).

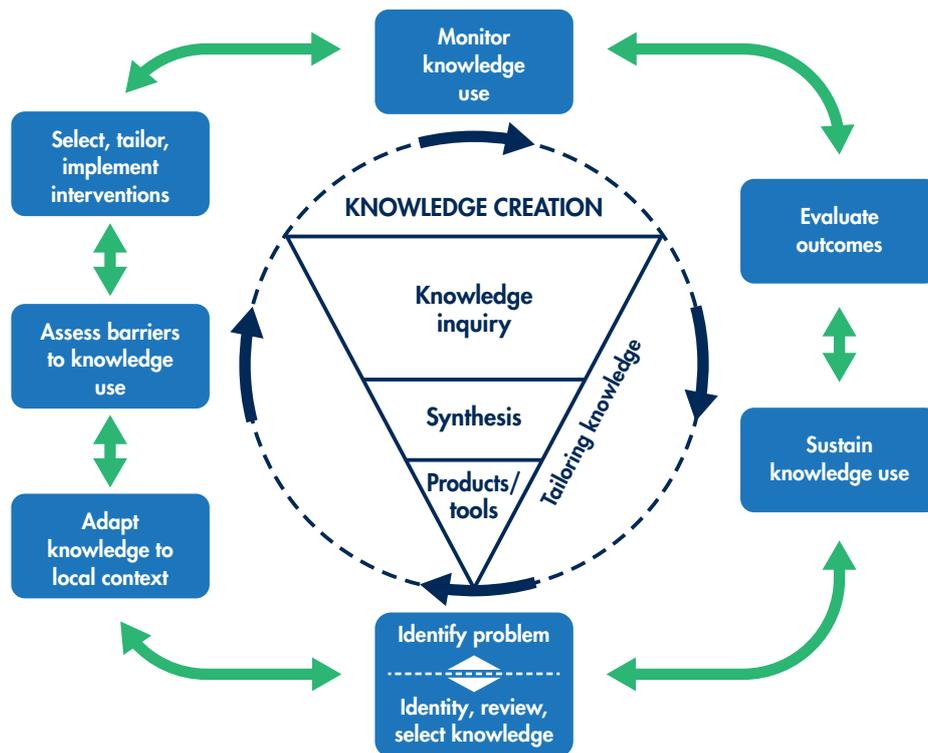
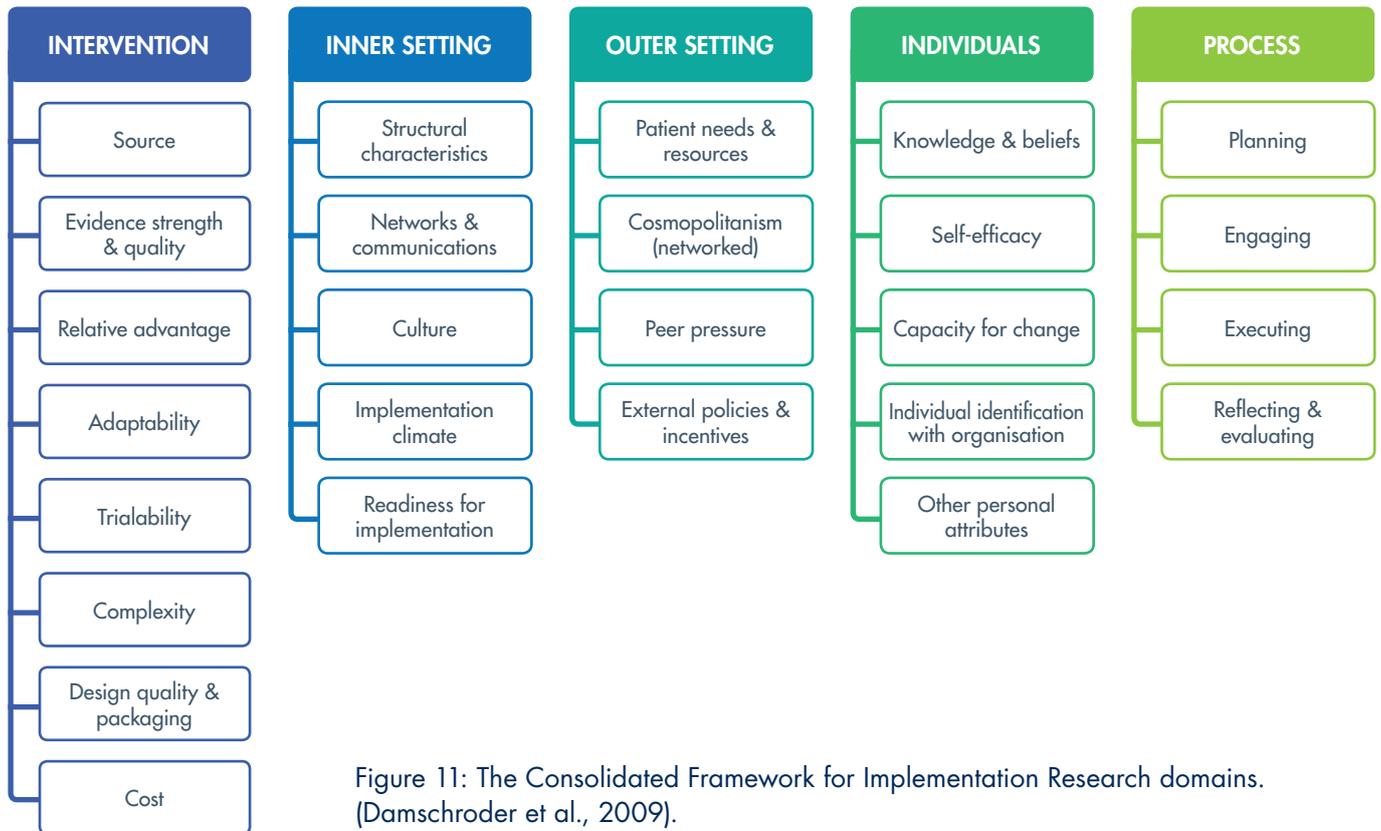


Figure 10: Knowledge to Action process. (Graham et al., 2006).

However what works in one context may not work in another (Cartwright, 2013; Cartwright & Hardie, 2012). Many interventions found to have been effective in health research studies fail to translate into meaningful patient care outcomes across multiple contexts (Damschroder et al., 2009). Successful knowledge translation requires that researchers work with stakeholders to develop an understanding of the context in which the knowledge will be used (Greenhalgh & Wieringa, 2011; Campbell, 2012).

The Consolidated Framework for Implementation Research (CFIR, Damschroder et al., 2009) is a conceptual model that consolidates existing theories and integrates them into a single framework to guide and inform implementation research. The framework identifies determinants of implementation in five major domains: intervention characteristics; outer setting; inner setting; the characteristics of the individuals involved; and the process of implementation.

For each domain in the CFIR model, a list of key constructs is identified (see Figure 11). Each construct has been linked to effective implementation. The menu of constructs can be used as a guide for identifying and assessing potential barriers and facilitators in preparation for the development of an implementation strategy. It provides a structure for understanding the context of an intervention to promote dissemination, optimise its benefits and prolong sustainability.



## Stakeholder engagement, relationships and collaboration

It is widely acknowledged that the meaningful involvement of knowledge users in the research process improves the relevance and use of research. Knowledge users need to be able to access and understand research evidence to benefit from it: this is a precondition for research impact. Subsequently, building genuine partnerships is key to effective knowledge translation (Campbell, Schryer-Roy, & Jessani, 2008; Greenhalgh & Wieringa, 2011; Innavaer, Vist, Trommald & Oxman, 2002) and a strong predictor of successful outcomes and research utilisation (Bowen & Martens, 2005; Phipps et al., 2012).

Successful knowledge translation relies upon partnerships, collaboration and contact between knowledge producers and users, usually from the outset (Campbell et al., 2008). This makes knowledge translation an intensely social process (Bowen & Martens, 2005; Campbell et al., 2008; Greenhalgh & Wieringa, 2011; Innavaer et al., 2002).

The significance of these relationships is captured in many research impact/knowledge translation models that identify the role of co-production, the necessary components for effective implementation, and place growing emphasis on integrated knowledge translation. (Phipps, Cummings, Pepler, Craig & Cardinal, 2016; Damschroder et al., 2009).

Figure 12, The Co-produced Pathway to Impact (Phipps et al., 2016) is a model that emphasises the role of co-construction and collaboration in delivering research impact. It recognises that as researchers and academics are not commonly responsible for producing products, policies or providing services, impact is necessarily mediated by others: i.e. occurring when researchers and/or academics collaborate with those who develop policies, products, and/or services. Subsequently “getting to impact is a shared enterprise” that requires ongoing collaboration throughout the process from research to impact (Phipps et al., 2016).

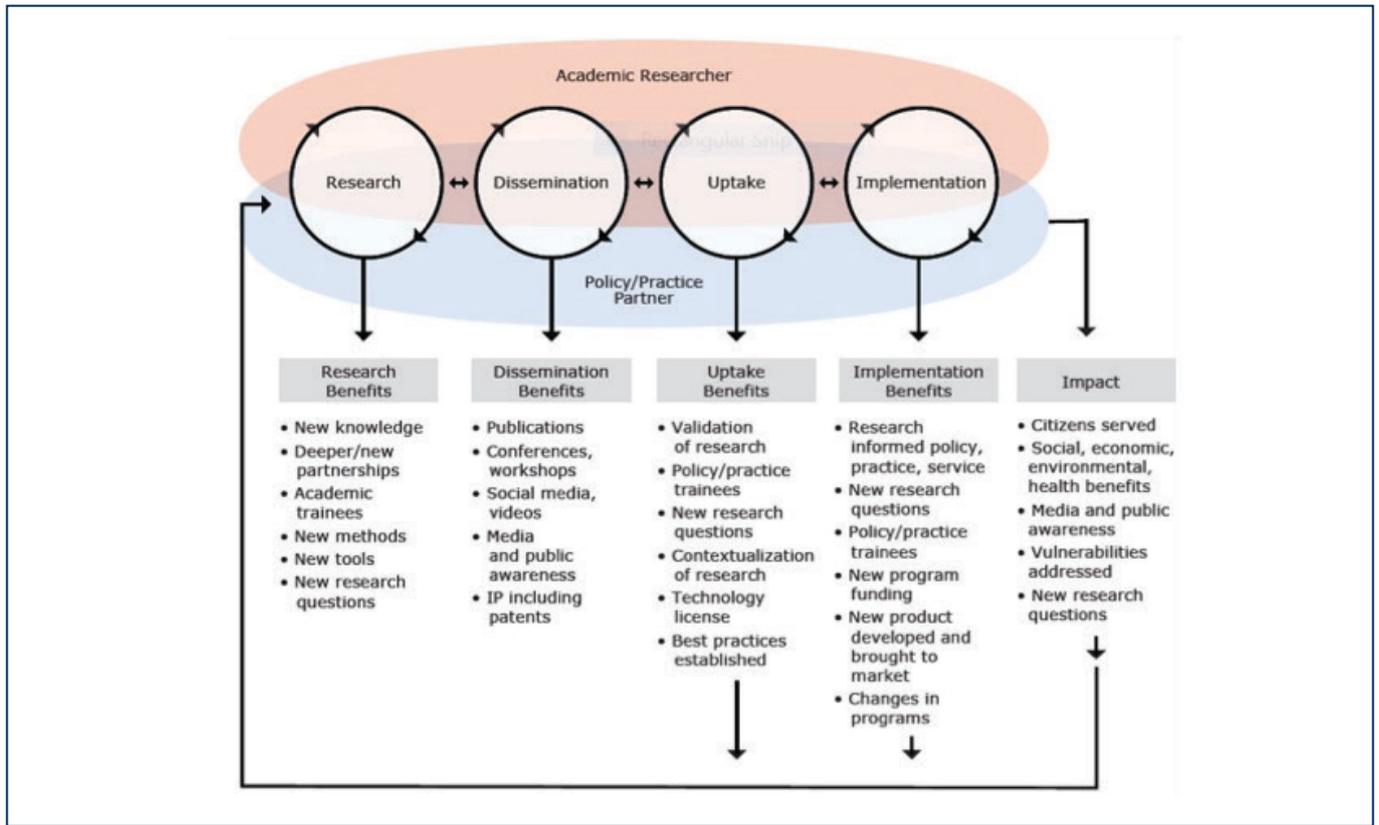


Figure 12: The Co-produced pathway to impact. (Phipps et al., 2016).

The important role of productive and effective partnerships with knowledge users during the research process to enable impact was consistently identified in the project consultations.

The considerable collaborative effort that often underpins research impact was recognised in the external consultations – in particular the importance of consumer involvement and engagement to ensure that their voices are included in the research process:

*“Consumer input throughout the process ensures that when research is translated into a different form of clinical practice, it can be done in a manner that’s appropriate, acceptable and agreeable for different consumers, or for the broader community.”*

Source: external consultation (Fong et al., 2016).

Identifying opportunities for greater links between research and clinical practice were considered to assist in achieving greater understanding and research impact. Respondents in the external consultations perceived evidence synthesis and co-designing research with knowledge users as effective strategies for influencing policy and informing clinical practice: “The clinical practice enhances research and research enhances clinical practice”. Knowledge intermediaries (also known as knowledge brokers) were also considered valuable for engaging and connecting stakeholders.

Figure 13 identifies the types of activities undertaken on campus to engage others in research (Fong et al., 2016). Reflected is a reliance on traditional outputs – the diffusion of research evidence via academic outputs. While these channels are essential, alone they are insufficient for optimising impact. The data indicates efforts to engage consumers, government and the public via media, however specific strategies were not captured in the survey.

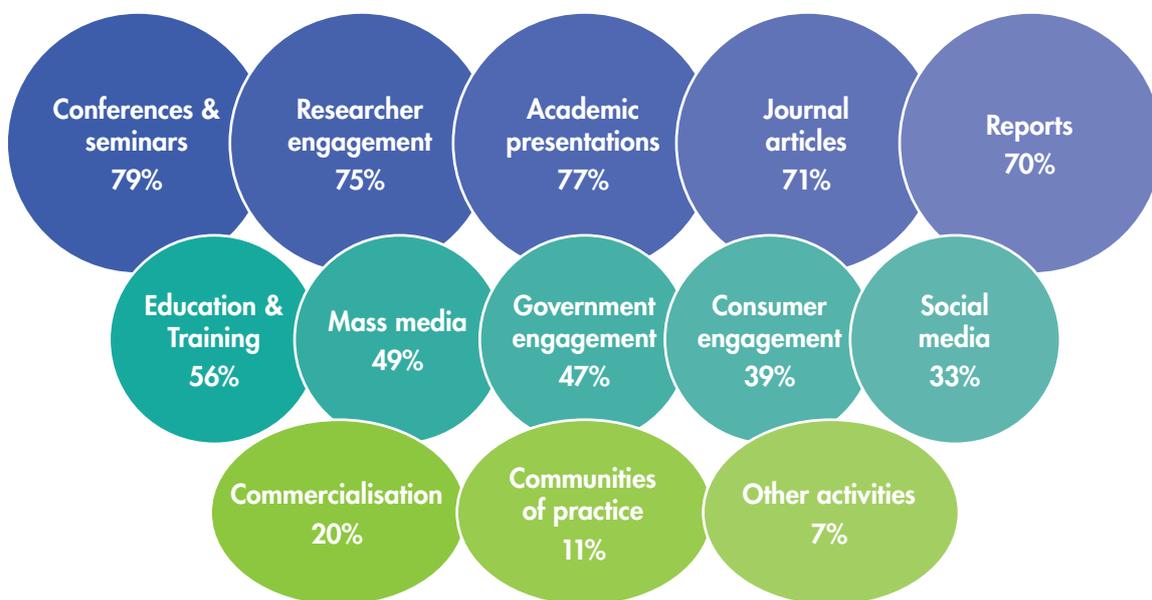


Figure 13: Which of the following activities do you undertake to engage others with your work?  
Source: Consultation Report (Fong et al., 2016).

There was a widespread view that there are opportunities for more effective collaboration on campus, and valuing and facilitating the role of research in clinical care though:

- greater leadership on research impact and its role in providing consistent, quality care
- common systems to facilitate collaboration and support greater integration
- mechanisms to enable measuring and reporting on research impact.

While productive and effective partnerships enable research impact, staff have reported challenges in identifying and establishing relationships with relevant stakeholders. Collaborative approaches present practical challenges – genuine and ongoing relationships can be difficult to establish and maintain, and not all clinicians, educators or research have the necessary skills and interest. The provision of assistance to help identify and engage stakeholders was identified as an enabler of knowledge translation.

## Impact measurement

Determining the impact of research requires measurement and evaluation, and the need to measure the full impact of research is being increasingly acknowledged (Australian Research Council, 2015; Group of Eight and the Australian Technology Network of Universities, 2012). However measures can often focus on outputs and accountability rather than impact. Traditional academic measures of impact – such as number of papers, impact factors of journals, frequency of citations, and number of research grants – primarily reflect the impact of research on other researchers operating with the academic ‘bubble’. These self-referential measures are widely used by research granting bodies and academic institutions, but they do not capture other benefits of research, such as shaping the development of policies, practices and products, as well as broader societal and economic impacts (Barwick, 2014; Milat, Bauman, & Redman, 2015).

In Australia and internationally, researchers are increasingly expected to be accountable for wider social impacts and produce value for money from their research, and funders are keen to demonstrate the benefits or research spending (ARC & DET, 2016; Greenhalgh et al., 2016; Milat et al., 2015). The Australian Research Council (2015) suggests that evidence of research impact could include the extent to which research outcomes have been taken up and used by policy makers, and practitioners, or have led to improvements in services or business. Impact measurement and the returns on investment of research are being used to highlight how funding is being used (Greenhalgh et al., 2016).

However, there is no simple way to measure and compare the less tangible health, social and economic (non-academic) impacts from different types and disciplines of research. A number of frameworks have been developed to assist in better capturing and understanding the non-academic impacts of research (ARC & DET, 2016; Greenhalgh et al., 2016; Guthrie et al., 2013; Milat et al., 2015; Penfield, Baker, Scoble & Wykes, 2014).

## The challenges of measuring impact

Measuring research impact is complex. Key challenges identified in the literature and highlighted in the consultations include:

- **time lags:** the variability in the time it may take for research to have an impact (Guthrie et al., 2013; Penfield et al., 2014). One review found that there was an average time of 17 years to move 14 per cent of research into clinical practice (Morris et al., 2011). Reviews of research ‘wastage’ (Chan et al., 2014) have highlighted the need to make research protocols and full results more widely available.
- **contribution and attribution:** it may be difficult to determine the relative contribution or attribution of research to a particular impact (Guthrie et al., 2013; Penfield et al., 2014). The ability and ease of attributing impact also decreases with time, while the impact may increase over time (Penfield et al., 2014).
- **capturing evidence of impact.** There are many ways of measuring research impact. Decisions need to be made about the resources required, which indicators will best capture evidence that confirms impact, and when and who will collect the data (Milat et al., 2015; Penfield et al., 2014).
- **the developmental nature of impact.** The degree of impact can change over time. The point of assessment of impact will influence the estimation of the significance of the impact. (Penfield et al., 2014).
- **administration:** tracking and collating data and evaluating impact can be time consuming and add to research costs. How can impact measurement and reporting be managed in an efficient and consistent way?

The difficulty of measuring impact was also a challenge identified in the campus consultations. The importance of both interim measures of impact and a breadth of impact measures were identified. Respondents noted that the current metrics often relate to productivity outputs (e.g. publications) rather than impact indicators, and that there is currently no overt benefit to the pursuit of knowledge translation.

The difficulty of comparing impact stemming from research in different disciplines was identified in the consultations. It was recognised that the reliance on quantitative outputs to measure impact meant that the important contribution of qualitative data for assessing end-user impact was often overlooked as it was relatively more difficult to collect, measure and compare (Fong et al., 2016).

There was general agreement on the importance of interim measures of impact. The external consultations identified the benefit of using metrics tailored to projects and the need for 'new' metrics that go beyond input (grants) and output (publications) to include knowledge translation goals, practice change and engagement measures. These observations were supported by the campus consultations:

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*"I think one of the challenges is going beyond the things that we can count. We can count grant dollars. We can count numbers of students and papers and impact factors, and that's clear-cut, but the issue that's always the grey zone is the impact that you're having. How do we get qualitative? If there are comments about your program saying, "It's fantastic. It's changed my practice." How does that get measured? ... How do you know you're reaching clinicians? We know that most people don't read a journal article. Even if there's a guideline, most people don't follow it."*

Source: campus consultations (Fong et al., 2016).

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The value of ensuring that data from projects was captured and shared was noted, and the question of the relative value of different types of impact was raised. Campus leaders valued the importance of measuring impacts on patient care: "If I do a piece of research, the way to measure the impact of that research would be to say, is that now contributing to the standard of care of patients here and around the world?" It is important to recognise however, that not all research will have instrumental (practice or policy ready) outcomes.

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*"If I do a piece of research, the way to measure the impact of that research would be to say, is that now contributing to the standard of care of patients here and around the world?"*

Source: campus consultations (Fong et al., 2016).

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# Organisational enablers of knowledge translation and research impact

Achieving research impact is a dynamic and complex process affected by interactions, relationships and systems. This project sought to identify factors that could contribute to building a consistent and effective approach to supporting knowledge translation, evidence-based care and maximising research impact for Melbourne Children's.

By drawing on evidence from the literature, international practice, consultations with campus leaders and staff, and advice from international and Australian knowledge translation and research impact experts, four organisational enablers critical for advancing knowledge translation and research impact were identified:

1. an organisational culture that values knowledge translation: the shared assumptions, values and behaviours on campus
2. organisational capacity for knowledge translation: the ability of the campus to utilise its resources
3. individual competency in knowledge translation: the skills of campus staff
4. collaboration: working with each other and knowledge users to advance impact.

The organisational enablers were used to analyse the project data to identify existing strengths, weaknesses, challenges and opportunities for each domain. By developing strategies to address these strengths, limitations and opportunities, campus partners can tackle barriers to advance the skills, knowledge and ways of working that will enable staff to better understand, plan for, facilitate and optimise research impact. (Please note that observations are not necessarily exclusive to the identified category).

Examples of potential strategies are provided in conjunction with each domain summary. These draw on evidence from the literature, environmental scan, consultations and expert advice.

## Culture

Culture refers to the shared assumptions, values and behaviours within Melbourne Children's.

Table 4 details the strengths, weaknesses, challenges and opportunities in culture for advancing knowledge translation and research impact. Many campus strengths were identified in this domain including high staff interest in developing skills to enhance knowledge translation and research impact, the clinician-scientist and policy fellowships that seek to bridge disciplinary gaps and foster collaboration, and the history of case studies in theme performance evaluation. The external funding environment poses both challenges and opportunities in this domain: can Melbourne Children's align its systems and processes with the changing environments? How can Melbourne Children's leverage its existing expertise to provide campus, and potentially sector leadership, on knowledge translation (KT) and research impact (RI)?

Table 4: Factors affecting culture.

CULTURE	
<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• High staff interest in developing skills to enhance KT and RI.</li> <li>• The focus on KT and RI provided by the Project over 12 months has assisted in raising awareness and interest. There is an opportunity to harness this momentum for further progress.</li> <li>• Clinician-scientist, and policy fellowships.</li> <li>• A wealth of KT/RI activity on campus</li> <li>• Teams on campus connected with local and international KT expertise and networks.</li> <li>• Excellent examples of knowledge synthesis and knowledge translation.</li> <li>• The performance evaluation process captures impact data including ten years of case studies.</li> <li>• Some KT research undertaken on campus.</li> </ul>	<p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• No framework to support a common understanding and approach to KT and RI.</li> <li>• No systemic way of connecting MCRI research to RCH practice.</li> </ul>
<p><b>Challenges</b></p> <ul style="list-style-type: none"> <li>• Ensuring that policies, processes and systems are aligned with changes in the external funding environment.</li> <li>• Current funding often doesn't fund or reward knowledge translation activity.</li> </ul>	<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Professors can play an important knowledge translation role in their capacity as educators.</li> <li>• RCHF can support KT and RI uptake through granting systems and reporting requirements.</li> <li>• The University of Melbourne participation in the ARC Engagement and Impact Assessment pilot is a potential learning opportunity for Melbourne Children's.</li> <li>• Quality leadership on research impact.</li> <li>• Showcasing projects of excellence.</li> </ul>

### Strategies identified to enhance culture include:

- establishing a shared understanding of knowledge translation as a pathway to research impact (with agreement on key terms)
- establishing a shared understanding of what is meant by impact and identifying domains of impact relevant to Melbourne Children's
- incorporating and reviewing the knowledge translation and research impact metrics in performance evaluation systems and processes
- recognising, communicating and incentivising effective knowledge translation and impacts from research in funding allocation and promotion
- providing leadership, including messaging about the value and importance of engagement and knowledge translation
- contributing to leadership in the sector, including contributions to Australian policy and practice development in knowledge translation, engagement and research impact
- undertaking knowledge translation research to contribute to building the evidence base on campus
- partnering with the RCHF to develop systems that encourage and enable grantees to report on knowledge translation activity and research impacts

- engaging with the University of Melbourne to learn from their Engagement and Impact Assessment pilot
- introducing staff awards for knowledge translation.

## Capacity

Capacity refers to the ability of the campus to utilise its resources to undertake knowledge translation to enable research impact. Table 5 identifies the strengths, weaknesses, challenges and opportunities for building organisational capacity for knowledge translation and research impact on campus. The strength of the campus is its outstanding history of research excellence and numerous examples of effective knowledge translation and research impact over many years. Weaknesses were prominent in this domain. Key weaknesses and barriers to enabling knowledge translation and research impact regarding capacity include the lack of common resources and tools to support knowledge translation activity, and limited funding and requirements for knowledge translation planning. The complexity of translating research into practice was acknowledged as a challenge. Opportunities identified included initiatives that fostered collaboration, united multidisciplinary teams and supported participation in national and international networks.

Table 5: Factors affecting capacity.

CAPACITY	
Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• Research excellence – studies are well conceived and designed.</li> <li>• Numerous examples of KT and RI excellence over many years.</li> <li>• Strong commercialisation support unit</li> <li>• The Melbourne Children’s KT Network – community of practice to advance KT and RI.</li> <li>• The availability of health economics expertise at MCRI.</li> <li>• Strong communications teams at MCRI and RCH.</li> <li>• The capacity of the RCH to fund research translation activity.</li> </ul>	<ul style="list-style-type: none"> <li>• No common resources/tools to support KT and advance research impact (therefore duplication of effort and waste of resources).</li> <li>• Limited funding for KT and RI.</li> <li>• Limited requirements for KT planning.</li> <li>• Lack of awareness of KT skills and resources on campus.</li> <li>• Limited mentorship and access to KT expertise.</li> <li>• No shared definition of KT and RI relevant to the campus.</li> <li>• Missed opportunities to increase the accessibility of research.</li> <li>• KT/RI activity on campus is fragmented.</li> <li>• No KT/RI strategy or framework to guide activities and action.</li> <li>• Limited investment in advancing KT research and practice.</li> <li>• Limited engagement of knowledge users.</li> <li>• A lack of time and support for research by clinical staff.</li> <li>• A lack of incentives for KT, implementation and planning for research impact.</li> </ul>

Challenges	Opportunities
<ul style="list-style-type: none"> <li>Translating research into clinical practice can be complex and time consuming.</li> </ul>	<ul style="list-style-type: none"> <li>The potential for automated systems to assist in capturing impact.</li> <li>Existing initiatives that incorporate clinical care, education and research.</li> <li>Participation in national and international networks.</li> <li>Multidisciplinary teams and collaborative practice.</li> </ul>

## Strategies identified to enhance organisational capacity include:

- providing tools and resources to facilitate effective knowledge translation and engagement such as communities of practice, frameworks and templates, mentoring and specialist advice, research evidence about effective knowledge translation
- utilising automated systems to assist in capturing impact data
- supporting initiatives that encourage professional exchanges to enhance the integration of knowledge into policy, programs and practice
- identifying opportunities for researchers and clinicians to engage with knowledge users in the design and implementation phases of research and knowledge translation planning
- identifying processes and strategies to enable clinicians to access the best available evidence for what works
- contributing to national/international collaborations to support knowledge translation practice and research impact.

## Competency

Competency refers to the individual skills of campus staff. Table 6 identifies the strengths, weaknesses, challenges and opportunities in developing individual competency for advancing knowledge translation and research impact at Melbourne Children's. The existing pockets of knowledge translation expertise and specialist skills are a strength, and the high level of interest and engagement by staff in knowledge translation and research impact present an opportunity to further enhance skills. The challenges of measuring and attributing research impact were noted, and limited access to opportunities to enhance practice are a weakness.

Table 6: Factors affecting competency.

COMPETENCY	
<b>Strengths</b> <ul style="list-style-type: none"> <li>Pockets of KT expertise and specialist skills.</li> </ul>	<b>Weaknesses</b> <ul style="list-style-type: none"> <li>Limited access to tools, frameworks and training to help staff to reflect on their practice and advance their knowledge and skills.</li> </ul>
<b>Challenges</b> <ul style="list-style-type: none"> <li>Attributing impact.</li> <li>The difficulty in capturing evidence of and measuring impact.</li> <li>Time lags in achieving impact.</li> </ul>	<b>Opportunities</b> <ul style="list-style-type: none"> <li>High staff interest and engagement in KT and RI.</li> </ul>

## Strategies identified to enhance individual competency include:

- providing opportunities for training in knowledge translation
- providing opportunities for internships or policy fellowships
- providing research teams with specialised knowledge translation expertise appropriate to the needs of Melbourne Children’s.

## Collaboration

Collaboration – multidisciplinary collaboration within and beyond Melbourne Children’s, and with knowledge users – enables knowledge translation and research impact. Table 7 identifies the strengths, weaknesses, challenges and opportunities for collaboration to enable knowledge translation and research impact. The individual strength of the organisations that constitute Melbourne Children’s was identified as a strength, but one that is yet to be fully optimised. While there are many examples of multidisciplinary excellence and collaboration, also noted were missed opportunities and barriers to sharing and developing expertise. It was acknowledged that building the relationships key to effective knowledge translation takes time, and identifying the right stakeholders may be difficult.

Table 7: Factors affecting collaboration.

COLLABORATION	
<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• Strength of the individual institutions in the partnership.</li> <li>• Examples of multidisciplinary excellence.</li> <li>• Pockets of excellence in collaboration with policy and practice decision makers.</li> <li>• Strong commercialisation unit.</li> <li>• Bytes4Health and digital health initiatives.</li> </ul>	<p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• There are intra-organisational boundaries to sharing knowledge and skills.</li> <li>• Missed opportunities for connecting knowledge users with policy and practice-ready research.</li> </ul>
<p><b>Challenges</b></p> <ul style="list-style-type: none"> <li>• Engagement, advocacy and establishing relationships takes time.</li> <li>• Identifying stakeholders and knowing how and when to engage them.</li> </ul>	<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Greater integration of Melbourne Children’s partners and opportunities to maximise the benefits of the co-location of leaders in infant, child and adolescent health.</li> <li>• Existing opportunities to collaborate and connect on campus.</li> <li>• MCRI staff awards for engagement.</li> <li>• The University of Melbourne participation in the ARC Engagement and Impact Assessment pilot is a potential learning opportunity for Melbourne Children’s.</li> </ul>

## Strategies identified to enhance collaboration include:

- engaging with the University of Melbourne to learn from their ARC Engagement and Impact Assessment pilot
- providing opportunities for training in collaboration and engagement
- providing opportunities to support effective engagement and collaboration with knowledge users, including partnerships between researchers and clinicians
- introducing staff awards for engagement and collaboration.

# The Melbourne Children's Knowledge Translation and Research Impact Framework

The Melbourne Children's Knowledge Translation and Research Impact Framework (Figure 1) is underpinned by evidence from the literature. It incorporates factors that support effective knowledge translation and research impact, and responds to the project consultations and expert advice.

The Framework, endorsed by the Internal Reference Group, seeks to provide the foundation for a consistent and effective approach to supporting knowledge translation, evidence-based care and research impact while recognising that achieving impact is a dynamic and complex process affected by interactions, relationships, systems and context.

The Framework is designed to support the vision of Melbourne Children's to optimise children's health and wellbeing, and:

- assist in knowledge translation planning and the identification of pathways for accelerating and measuring research impact
- encourage thinking, planning for and the measurement of, knowledge translation and research impact
- build understanding of the relationship between research: aims; activities; outputs; and anticipated impact to enable consideration of how, where and why impact may occur
- establish a shared vision of research impact and innovation to advance the strategic goals of campus partners.

The Framework builds on a traditional logic model to establish a pathway to impact from the creation of knowledge and research to its ultimate impact. It is a tool to assist in turning a generic pathway into a specific pathway to impact.

## Melbourne Children's Knowledge Translation and Research Impact Framework

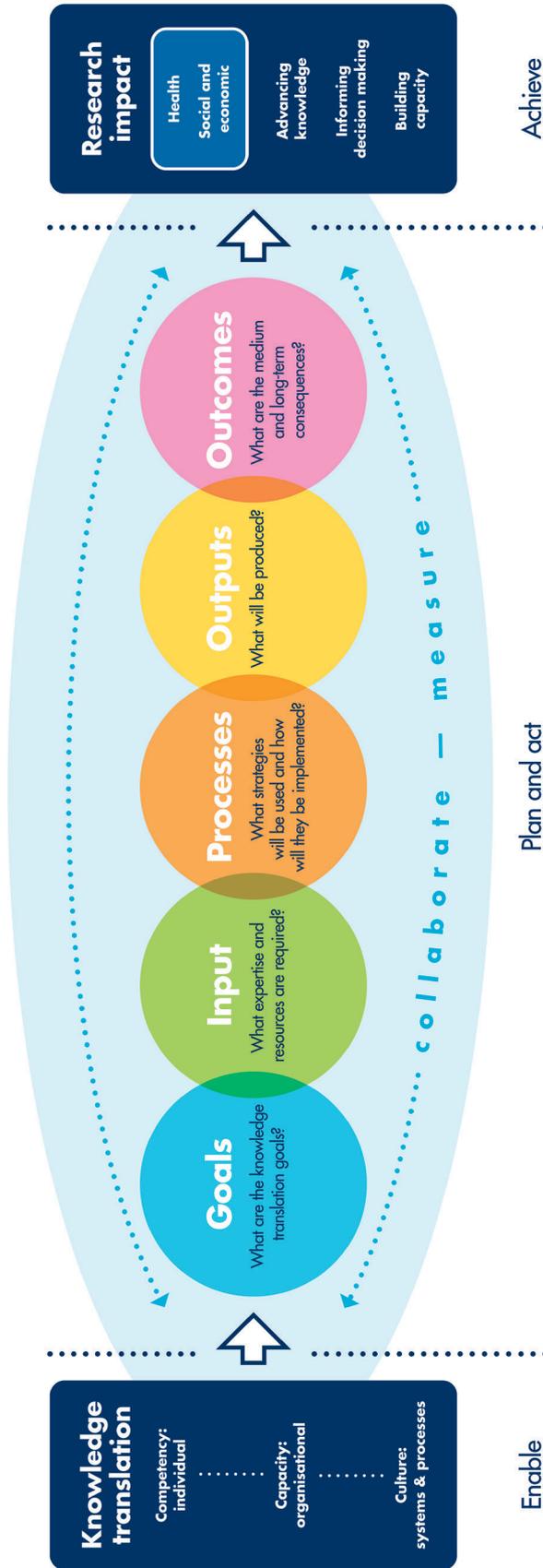


Figure 1: Melbourne Children's Knowledge Translation and Research Impact Framework (impact categories adapted from the Canadian Academy of Health Sciences, 2009).

## Core elements of the Framework

Elements that facilitate research impact on campus are grouped under three phases within the Framework: enable; plan and act; and achieve. The Framework recognises the role of knowledge translation in forging the pathway to impact – increasing the relevance of research, making findings accessible and facilitating their implementation. It is structured to be widely applicable and relevant to clinical, educational and research teams at various levels including projects, teams or themes.

**Enable:** This section of the Framework focuses on the creation of an enabling environment – establishing the conditions required to encourage participation and advance impact. The Framework incorporates the organisational enablers – building capacity, culture and competency in knowledge translation – as a critical foundation for advancing research impact. Collaboration is also an enabler of research impact: achieving impact is reliant upon successful relationships throughout the knowledge translation process, and intra-organisational collaboration supports the shared vision of Melbourne Children’s.

**Plan and act:** This section embeds planning the pathway to impact into the Framework, and highlights the ongoing need for engagement, collaboration and measurement in achieving impact.

**Achieve:** The earlier phases of the Framework seek to provide insight into how impact can be produced and enhanced. The final phase maps the process to five impact categories derived from the CAHS Framework: advancing knowledge; health impacts; capacity building; informing decision making; social and economic impacts (CAHS, 2009). The Framework reflects the priorities of the campus by highlighting two impact categories that reflect the ultimate strategic priorities of the campus: health impacts, and social and economic impacts.

By building capacity for effective knowledge translation, developing researcher competencies to maximise impact, articulating a pathway to impact and identifying desired impacts at the outset, the three phases of the Framework (enable; plan and act; and achieve) provide a conceptual framework for optimising and accelerating research impact.

The visual linearity of the Framework (see Figure 1) belies the complexity of the knowledge to practice eco-system – it is dynamic, interactive and reliant on interdependent and simultaneous feedback. While there is a clear progression established in the Framework, impact may occur at any point – the relationships between elements of the Framework are not simple or linear. However, simplifying the reality of the pathway to impact in this way enables the process to be more easily understood and enables the identification of key elements and goals along the pathway that advance impact.

Importantly, the Framework doesn’t work in isolation of the context in which it sits. The pathways to impact are organic – they are dependent on the wider context and are subject to change as a project progresses. Consideration should be given to the internal and external environment in which the Framework is being applied.

There are many input-to-impact models that depict pathways to impact. The Framework seeks to advance an understanding of the progress toward impact by identifying the infrastructure required to achieve this: the elements that enable the planning for, monitoring, evaluation and achievement of impact. It identifies:

- the role of a knowledge translation culture, competencies and capacity in enabling the achievement of impact
- the ongoing contribution of planning, collaboration and monitoring to achieving impact
- research impact categories.

# Applying the Framework

The Project Team sought to test the Framework by applying it to four campus case studies (See Table 8 and Appendix A-C). This section of the report details the application and insights from the mapping process.

The Murdoch Childrens Research Institute captures performance evaluation data as part of an annual review for each research theme. This data is used to evaluate research performance, distribute internal funding, and inform strategic planning. Four outstanding case studies from these annual reviews have been mapped to the Framework.

The case studies were sourced from reports in the MCRI Performance Evaluation Committee papers and supplemented with additional information from lead researchers who were invited to comment on the drafts for completeness and accuracy.

- **Case study #1:** Reducing the global burden of gastroenteritis. Project leads: Professor Julie Bines, Associate Professor Carl Kirkwood.
- **Case study #2:** Disorders of sex development. Project leads: Professor Andrew Sinclair and Dr Katie Ayers.
- **Case Study #3:** Take a breath. Project leads: Professor Vicki Anderson, Dr Frank Muscara, Dr Meredith Rayner.
- **Case Study #4:** Improving evidence-based management of bronchiolitis through tailored knowledge translation interventions or strategies. Project Leads: Associate Professor Ed Oakley, Associate Professor Franz Babl, Dr Tibor Schuster, Dr Emma Tavender, Cate Wilson, Francesca Orsini.

The case studies demonstrate the potential alignment of the Framework to research undertaken at Melbourne Children's and identify the elements contributing to effective knowledge translation and achieving impact.

At present, data in the performance evaluation reports contains limited information about process, planning for knowledge translation, monitoring progress, and the factors that enabled or hindered the process. Subsequently, additional information on the case studies was sought from the project leads to supplement the published performance evaluation information and to provide more comprehensive profiles of the projects. The barriers and enablers identified in the case studies were consistent with findings from the literature review and consultations.

Enablers of knowledge translation and research impact evident in the four case studies include:

- having dedicated knowledge translation expertise and leadership on the project
- establishing relationships with researchers, relevant departments, government, and international knowledge translation and disciplinary expertise
- engagement of key stakeholders including clinicians and consumers
- participation in committees and steering groups.

Barriers to knowledge translation and research impact identified in the four case studies include:

- the application of new technology and its implications for ethics and data collection
- time and funding
- identifying and engaging relevant stakeholders
- identifying appropriate strategies for raising awareness
- data collection (and managing variation in data collection)
- defining the scope of the problem to be addressed.

Further observations about the process of knowledge translation and achieving research impact were noted from the application of the Framework to the case studies. There was a lack of distinction between outputs, outcomes and impact in planning for, and reporting on research impact, prompting the question ‘how should these terms be understood and applied?’ The distinction between knowledge translation and research goals in the case studies provided clarity, however it is not clear whether these goals were determined at the outset of the project or during the process. There was also a lack of clarity about the timescale applied: most case studies shared stories of work in progress. No common point-in-time measures were applied.

### **Case Study #4: Improving evidence-based management of bronchiolitis**

*Improving evidence-based management of bronchiolitis through tailored knowledge translation interventions or strategies, Case Study #4* (see Table 8) has been mapped to the Melbourne Children’s Knowledge Translation and Research Impact Framework (see Figure 1). This enables the ready identification of key elements highlighted in the Framework: the planning process, the nature of the intended impact; insight into the contribution of collaboration, identification of process measures, and factors that enable and obstruct the pathway to impact. Refer to Appendices A–C to see case studies #1–3 mapped to the Framework.

**Table 8: Case Study #4 – Improving evidence-based management of bronchiolitis through tailored knowledge translation interventions or strategies.**  
*Lead campus researchers: Associate Professor Ed Oakley, Associate Professor Franz Babl, Dr Tibor Schuster, Dr Emma Tavender, Cate Wilson, Francesca Orsini*

GOALS	INPUTS	PROCESSES	OUTPUTS	OUTCOMES	IMPACT
<p>Knowledge translation goals: To promote widespread implementation of evidence-based clinical practices for the management of bronchiolitis, using knowledge translation techniques found to be beneficial in this study.</p> <p>To contribute to the science of improving clinical care in the emergency department and develop a suite of transferable knowledge translation tools for the implementation of clinical best practice across a range of contexts and conditions.</p> <p>Research goal: To determine if tailored knowledge translation strategies improve the uptake of evidence-based guideline recommendations for the management of infants with bronchiolitis, compared to control hospitals that only receive the guideline.</p>	<p>A retrospective medical audit of sites in Australia and New Zealand provided evidence for the need for improved management of bronchiolitis.</p> <p>Relationships with the Australasian College for Emergency Medicine (ACEM), the Royal Australasian College of Physicians (RACP), and PREDICT have been crucial in the development of the guideline and the planning and implementation of the trial.</p> <p>Financial support for translation was provided by the National Health and Medical Research Council (NHMRC) and the Health Research Council New Zealand.</p>	<p>Theoretical frameworks were used to develop and implement the tailored knowledge translation interventions.</p> <p>Qualitative interviews were conducted prior to implementation with end users and key stakeholders, including emergency department and general paediatric clinicians. This allowed for detailed analysis of individual and organisational factors influencing both the management of infants with bronchiolitis and knowledge translation and impact processes in the emergency care setting.</p> <p>A systematic mapping process to identify appropriate behaviour change techniques, explore acceptability and feasibility, and tailor the approach.</p> <p>Research translation efforts led by a staff member dedicated to providing leadership in knowledge translation.</p>	<p>Tailored knowledge translation interventions.</p> <p>Evidence-based guideline recommendations.</p> <p>Publications in peer reviewed journals and conference presentations.</p>	<p>Immediate improvement in bronchiolitis management is anticipated in intervention sites. If the research demonstrates that tailored knowledge translation interventions improve the uptake of evidence-based guideline recommendations, these interventions will then be implemented in control sites and across Australia and New Zealand, improving health outcomes for patients of those emergency departments.</p> <p>Twenty-four hospitals across Australia and New Zealand are participating in the trial, results of which are likely to inform ongoing clinical practice in each site. Through engagement with a range of stakeholders, there is a receptive audience for the findings in the region and internationally, and the development of the guideline may also inform decision making about best practice in other sites. Further, increased understanding about knowledge translation processes will support the development of strategies to support clinical improvement across a range of conditions and contexts.</p> <p>Improved clinical practice will provide more efficient care, improving access and outcomes in emergency departments which implement the guidelines. Health economists have been engaged with the trial, in order to quantify the economic benefits of developing and implementing tailored knowledge translation strategies and their effect on health outcomes and processes of care.</p> <p>The research will contribute to knowledge about the effectiveness of knowledge translation strategies to support the uptake of clinical guidelines for the management of bronchiolitis among infants. It will also contribute to the science of knowledge translation for the uptake of a range of evidence-based clinical approaches; recommendations which will contribute to a suite of proven strategies for a range of conditions. These strategies will then be able to be applied without the need for further RCTs in many cases. In addition, the research team is advocating for improvements in the way data is collected and reported nationally, reducing the need for research audits in order to measure clinical practice.</p> <p>As well as building clinical and knowledge translation capacity among those participating in the intervention arm of the trial, if the tailored knowledge translation strategies are proven effective, training will be offered to control sites immediately following the trial. The research team is committed to developing knowledge translation capacity in the PREDICT network, and organises regular workshops and an international visiting fellows program. The network also supports several PhD students and Masters students who study across a range of subjects, including health economics.</p>	<p>Health</p> <p>Informing decision making</p> <p>Social &amp; economic</p> <p>Advancing knowledge</p> <p>Building capacity</p>

Table 8: continued

GOALS	INPUTS	PROCESSES	OUTPUTS	OUTCOMES	IMPACT
<p><b>Collaborators:</b> Engagement with key stakeholders in developing the guidelines and recruiting for the trial has provided a strong foundation for translation and impact activity. This has included the establishment of new research relationships, and continued interaction with emergency departments throughout Australia and New Zealand at network meetings, workshops and site visits. Engagement with emergency departments in regional areas that may not normally participate in research has also been fostered via this network. Liaison with government representatives has supported advocacy for improved data collection which will enable ongoing monitoring of translation activity and the implementation of recommendations. In addition, several stakeholders outside of trial sites attended training to generate interest in future uptake and build capacity. The research team is also engaging with knowledge translation and emergency medicine experts in Canada including TreKK and KT Canada, to address similar barriers and enablers in a range of international contexts.</p>					
<p><b>Monitors:</b> The cluster randomised-controlled trial will measure compliance and non-compliance using patient data on clinical interventions and clinical outcomes related to bronchiolitis. Follow-up file audits will be conducted one year later to assess the sustainability of change and longer term outcomes. Process evaluation will also be conducted to assess the fidelity of the intervention, including process logs, site visits and post-implementation interviews. Process measures will assess intervention fidelity and if it reached the target group, perceptions of success and acceptability. The feasibility of scaling up the intervention nationally will also be explored through analysing process measures.</p>					
<p><b>Enablers:</b> Dedicated knowledge translation leadership, relationships with researchers, emergency departments, government and international knowledge translation and emergency medicine experts.</p>					
<p><b>Barriers:</b> Insufficient time and variation across data collection systems limited the ability to clearly define the size and scope of the problem to be addressed through comprehensive data gathering from a broader range of contexts.</p>					

## Key findings and recommendations

The key findings and recommendations from the Project align with the seven identified facilitators of effective knowledge translation and research impact: leadership; shared terminology; alignment with national and international funding and practice; incentives; skills, tools and resources; engagement and collaboration; and impact measurement.

- 1. Leadership** – the strengths and achievements of Melbourne Children’s mean it is well placed to harness existing capacity and optimise engagement, knowledge translation and research impact. Knowledge translation is a growing research field and practice speciality with the potential for further development. There are opportunities for leadership in knowledge translation and research impact both within and beyond the campus.

### Recommendations:

- 1.1 Melbourne Children’s recognise and support the role of knowledge translation in advancing research impact, clinical care and education.
  - 1.2 MCRI pilot the application of the Melbourne Children’s Knowledge Translation and Research Impact Framework developed through this project with selected research teams to determine its applicability to advancing planning and impact, with a particular focus on translation in the clinical setting of RCH.
  - 1.3 MCRI monitor, evaluate and report on the application of the Framework and its effectiveness in facilitating research impact.
  - 1.4 MCRI engage with the University of Melbourne to understand the implications of the ARC Engagement and Impact Assessment pilots for Melbourne Children’s.
  - 1.5 Campus partners review the strengths, weaknesses, challenges and opportunities identified in the Project to inform the development of strategies to advance knowledge translation and research impact.
  - 1.6 Campus partners identify how processes and systems can be enhanced to encourage and enable staff to value and articulate impact.
- 2. A shared understanding of key terms** – there is wide variation in the terminology and concepts used to describe knowledge translation and research impact. The multiplicity of terms creates confusion and distracts from common action to advance knowledge translation. Establishing and applying a shared understanding of key terms will assist in planning for impact, progressing research impact strategies, and ensuring that the expectations of funders and researchers are aligned.

### Recommendations:

- 2.1 Campus partners apply and promote the Melbourne Children’s Knowledge Translation and Research Impact Framework developed through this project to build a shared understanding of knowledge translation and research impact.
  - 2.2 Campus partners adopt the following definitions of knowledge translation and research impact:

Knowledge translation is the synthesis, exchange and application of knowledge by relevant stakeholders to accelerate innovation in improving children’s health and strengthening health systems (adapted from WHO, 2006).

Research impact is the demonstrable contribution that research makes to the economy, society, culture, national security, public policy or services, health, the environment, or quality of life, beyond contributions to academia (ARC, 2012).

Melbourne Children's research impact categories (derived from CAHS, 2009)

- Health
- Social and economic
- Advancing knowledge
- Inform decision making
- Building capacity.

**3. Alignment with national and international funding and practice** – there is increasing national and international emphasis from funders on achieving, measuring and communicating research impact, however campus staff are primarily focused on outputs and traditional knowledge translation activities. Changes in the external environment will have an impact on funding for research and funding compliance, and consequently, activities on campus. Staying abreast of, and informing the changes where possible, will be important in the immediate future.

**Recommendation:**

3.1 MCRI monitor and prepare for the changing funding environment to enable an agile campus response.

**4. Incentives for knowledge translation planning and research impact measurement** – incentives are required to build capacity for planning for and optimising research impact. Incentives for planning, knowledge translation, engagement and collaboration are likely to increase organisational capacity for research impact.

**Recommendations:**

4.1 Campus partners incentivise and support the planning for, and capture and reporting of impact including, for example, staff awards for knowledge translation, and engagement and collaboration.

4.2 The Royal Children's Hospital Foundation develop systems to encourage and support grantees to articulate and report on their proposed impact pathway (including engagement, collaboration and measurement).

**5. Skills, tools and resources for effective knowledge translation** – staff have expressed interest in additional support and training to improve their skills to enhance the impact of research. Currently there is a lack of common tools to support knowledge translation planning and the conceptualisation of pathways to impact. Resources and tools are required to provide support and guidance, build staff capacity for effective knowledge translation and research impact planning, and ensure that research is accessible and relevant to knowledge users. A shared approach to planning that prompts consideration of why, when, where and how impact may occur, and could be measured and communicated, would assist in achieving research impact. By establishing a pathway to impact, the proposed Melbourne Children's Knowledge Translation and Research Impact Framework could provide a common, unifying conceptual model.

**Recommendations:**

5.1 Campus partners identify how processes and systems can be enhanced to encourage and enable staff to value and articulate impact.

5.2 Campus partners invest in the resources and research required to support and foster knowledge translation and optimise research impact at Melbourne Children's.

5.3 Campus partners invest in knowledge translation skills development for researchers including: training, tools, templates, resources.

5.4 Campus partners invest in the compilation and creation of digital knowledge translation tools and resources in a location accessible to all staff.

5.5 MCRI identify strategies for capturing and sharing learning to advance practice in knowledge translation and research impact.

- 5.6 MCRI review the performance evaluation case study requirements to capture more comprehensive information about what contributes to achieving impact.
- 5.7 Campus partners provide opportunities for internships or fellowships.

**6. Collaboration** – productive and effective relationships enable research impact. Staff currently undertake a range of activities to engage others in their work, however this engagement is dominated by a reliance on traditional outputs such as journal articles and academic presentations. There are many opportunities for encouraging professional exchanges to enhance the integration of knowledge into policy, programs and practice.

### **Recommendations:**

- 6.1 Campus partners identify and incentivise strategies for improving engagement and collaboration to optimise research impact.
- 6.2 Campus partners build understanding among researchers of the role of engagement and collaboration in achieving and measuring research impact, and support increased engagement activity (where appropriate).
- 6.3 Campus partners provide opportunities for training in collaboration and engagement.

**7. Impact measurement** – there is a growing need to measure the full impact of research beyond the traditional academic measures. Responding to this demand for greater accountability would be facilitated by a shared approach to knowledge translation planning that prompts consideration of where and how impact may occur, and could be measured, and how data may be collected and communicated. Tools and resources that support tracking and collating data, and mapping to common research impact domains, may assist in measuring impact.

### **Recommendations:**

- 7.1 All research grant applicants be encouraged to articulate their proposed impact pathway (including engagement, collaboration and measurement).
- 7.2 MCRI review the performance evaluation case study requirements to capture more comprehensive information about what contributes to achieving impact.
- 7.3 MCRI identify time and cost-effective strategies for articulating and measuring research impact. Consideration should be given to compiling a library of indicators and metrics for use along the impact pathway and utilise tracking software (e.g. Researchfish, W-Impact Tracker) as a cost-effective means of collecting, measuring and communicating impact.

## Conclusion: where to next?

Impact may well occur serendipitously, however optimising impact requires investment and planning. Delivering ongoing excellence in the provision of care to infants, children and adolescents requires an organisational culture that values knowledge translation, provides resources to enable knowledge translation and prepares researchers and clinicians to engage in knowledge translation and report on the impact of those activities.

Melbourne Children's seeks to be world leader in child and adolescent health through the integration of prevention and early intervention, clinical care, research, education and training, and academic leadership. It recognises that high quality care relies on the integration of research and education to ensure best practice and minimise unnecessary variation in care. This co-location of clinical care, research and education is a strength of Melbourne Children's: it provides a unique environment for leadership in research and education, and its integration into clinical practice. While this provides a rich environment for accelerating the translation of knowledge into practice, it is a relationship that is yet to be fully optimised (Fong et al., 2016).

Supporting excellence in knowledge translation and impact requires embedding goals, practical guidance, activities and targets at a strategic level: a Melbourne Children's Knowledge Translation and Research Impact strategy. It requires an environment to trial approaches from within and outside to maximise expertise and research impact, identify challenges and solutions, and ensure that planning for impact is sustainable and aligned with the strategic objectives of campus partners.

By identifying the organisational enablers (culture, capacity, competency and collaboration), a planning pathway, and facilitators of impact, the Melbourne Children's Knowledge Translation and Research Impact Project provides a structure and foundation for the development of a campus strategy to facilitate knowledge translation and optimise research impact.

Additional work is needed to develop a comprehensive, collaborative and consistent approach to advancing research impact at Melbourne Children's. This requires campus partners working together to build organisational enablers, establish a plan for action consistent with the facilitators, and operationalise the Framework to determine its capacity to:

- increase the speed and efficiency of the application of research | ACCELERATION
- increase the accessibility of research | ACCESSIBILITY
- demonstrate responsible and effective use of funding | ACCOUNTABILITY
- increase the awareness of, and demonstrate the value of, research | ADVOCACY
- enable progress towards impact be monitored and inform the future allocation of resources | ALLOCATION
- enable understanding of the reasons for the success or failure of research impact | ANALYSIS (adapted from Guthrie et al., 2013).

The application of the Framework will assist campus partners in the development of a common understanding of the process of change and drivers of impact, and allow partners to more meaningfully convey their achievements. It provides the foundation for a consistent approach to strengthen planning, monitoring and reporting on progress to funders and stakeholders of the diverse research activities undertaken at Melbourne Children's. It also has the potential to increase our capacity to demonstrate the significant benefits accrued by research, and attract research funding.

A shared vision of research impact and innovation that encourages consideration of how, where and why impact may occur will underpin a campus strategy and contribute to building a knowledge base to:

- facilitate and accelerate the translation of knowledge into practice and policy
- advance the strategic priorities of campus partners
- support multidisciplinary research excellence
- enhance our national and international reputation for leadership in health research
- grow our collaborative research efforts
- minimise waste and duplication, and maximise the use of resources
- align with a changing external environment and international practice
- inform strategies for knowledge translation planning and research impact measurement and reporting.

The Project Team will finalise a plan of action with campus partners and commence pilot work with select research teams over the next three years (2017-2019). The project will trial the Framework as a foundation for a knowledge translation research impact strategy, and test its applicability to the campus and its ability to harmonise the Melbourne Children's approach with emerging changes at a national level to enhance and accelerate impact. Research teams will be provided with training, coaching, tools and resources. The pilot will assist campus partners in building an understanding of the processes identified in the Framework and inform the development of a coherent campus approach to advancing research impact.

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# Appendices

## Appendix A: Case study #1 – Reducing the global burden of gastroenteritis

Lead campus researchers: Professor Julie Bines, Associate Professor Carl Kirkwood

GOALS	INPUTS	PROCESSES	OUTPUTS	OUTCOMES	IMPACT
<p><b>Knowledge translation goal:</b> Cost-effective routine vaccination for newborns to prevent rotavirus (associated with the deaths of 450,000 children each year).</p> <p><b>Research goal:</b> To understand and reduce the global rotavirus disease burden through development of vaccines, and specifically, to overcome challenges to routine vaccination among infants under 6 weeks old.</p>	<p>Discovery of the vaccine in 1973 and over 40 years of research activity.</p> <p>Relationships with key international bodies.</p> <p>Licensing and manufacturing agreements, and a relationship with surveillance bodies.</p>	<p>Advocacy for the inclusion of the new vaccine in routine vaccination programs through ongoing stakeholder relationships.</p> <p>Business development opportunities and the definition of legal relationships.</p> <p>Other advocacy efforts to raise the profile of the research program and the vaccine in a range of ways, including through partnerships in the arts.</p>	<p>International media mentions.</p> <p>Training offered in Indonesia, supported by manualised training and resources.</p> <p>Leadership appointments and awards.</p> <p>Publications in peer reviewed journals and conference presentations.</p>	<p>Vaccine administered in more than 1500 newborns in NZ and Indonesia, and newborns are protected from rotavirus.</p> <p>Contribution to the Millennium Development Goal 4: Reducing child mortality.</p> <p>Continued advocacy with decision making bodies about the availability of the vaccine and administration approach once clinical trials are complete.</p> <p>A focus on data, products and technology has targeted health inequity through cost reduction and solving challenges relating to access.</p> <p>Global implementation of the new vaccine would avert 6 million clinic and hospital visits and save US\$68million annually.</p> <p>Increased awareness of the vaccine assisted in recruitment into efficacy trials.</p> <p>Increased understanding of rotavirus.</p> <p>Local health care workers in Indonesia have increased skills to ensure patient care is of a high quality, accompanied by resources and ongoing communication.</p> <p>The opportunity to develop research capacity of two Indonesian medical professionals.</p> <p>The relationship with the Indonesian government's manufacturing company will provide training opportunities and will build vaccine development capacity in Indonesia and Australia.</p>	<p>Health</p> <p>Informing decision making</p> <p>Social &amp; economic</p> <p>Advancing knowledge</p> <p>Building capacity</p>
<p><b>Collaborators:</b> World Health Organisation, Bill and Melinda Gates Foundation, US Centers for Disease Control and Prevention; University of Gadja Mda Jogjakarta; and, vaccine manufacturers.</p>					
<p><b>Monitors:</b> Monitoring hospitalisations, diagnosis and deaths, as well as monitoring adoption of recommended policies and guidelines and risks of the intervention.</p>					
<p><b>Enablers:</b> Relationships with appropriate groups and individuals within key decision-making bodies, including establishing mutual trust through a presence on committees and steering groups, sabbaticals and making contributions to the efforts of these organisations in other ways.</p>					
<p><b>Barriers:</b> Not identified.</p>					

## Appendix B: Case study #2 – Disorders of sex development

Lead campus researchers: Professor Andrew Sinclair, Dr Katie Ayers

GOALS	INPUTS	PROCESSES	OUTPUTS	OUTCOMES	IMPACT
<p>Knowledge translation goals: To improve clinical practice in the field through making the diagnostic techniques widely available as a clinical test.</p> <p>To raise awareness of the complexity of DSD.</p> <p>Research goal: To successfully identify and test improved diagnostic techniques suitable for clinical use, using Massively Parallel Sequencing (MPS), or Next Generation Sequencing) technologies in order to increase the number of patients who can be given an accurate molecular diagnosis.</p>	<p>Decades of research compiling genetic information of patients, and existing and ongoing relationships with clinicians and researchers.</p> <p>Financial support from the NHMRC and the Helen McPherson Trust.</p>	<p>The test is currently undergoing NATA accreditation in TGU at MCR/VCGS so that it will be available as a clinical diagnostic test for patients.</p> <p>The relationship with VCGS will be crucial to supporting access to the diagnostic tool in clinical settings, as VCGS will lead the accreditation process with the national accreditation body, NATA.</p> <p>Drafting of international guidelines for the use of the technique.</p> <p>Involvement by the Molecular development team in multi-disciplinary clinical team meetings and paediatric DSD/endocrinologist/urologist conferences supports uptake of the technique.</p>	<p>Close to 100 clinicians in 12 countries have been involved in recruiting patients.</p> <p>Development of a website to support community understanding (<a href="http://www.dsdgenetics.org/">http://www.dsdgenetics.org/</a>).</p> <p>The establishment of a secure international database, enabling further research in the field.</p> <p>Publications in peer reviewed journals and conference presentations.</p>	<p>At least 300 patients have been tested using the innovative, cost-effective, diagnostic technique developed by MCR.</p> <p>Increased likelihood of receiving an accurate diagnosis to 43% overall, with 60% in some groups of DSD.</p> <p>Improved and rapid diagnosis of patients improves quality of care for families and guides the clinical management they receive. Once the technique is accredited, many more clinicians and patients will have access to it.</p> <p>The diagnostic technique is used by RCH, including for national and international patients.</p> <p>Several other institutions internationally are using the database and the technique, and there is further interest from at least 27 clinics in 12 countries in using it once accredited as a clinical test or as a research tool.</p> <p>The diagnostic technique represents an economical means of improving the genetic diagnostic capability for patients affected by DSD.</p> <p>The website raises awareness among the general community, and has received positive feedback from patient groups.</p> <p>Increased knowledge of DSD gene regulation.</p> <p>The diagnostic technique is being used on a research basis in a number of institutions. The findings will also support future identification of novel genes.</p> <p>The secure international database has enabled further research in the field.</p> <p>The additional genetic information found as a result of the test, with patient consent, will contribute to future efforts to find new genes, and therefore increase diagnostic rate in time.</p> <p>The website is used to teach university students and includes information for clinicians.</p>	<p>Health</p> <p>Informing decision making</p> <p>Social &amp; economic</p> <p>Advancing knowledge</p> <p>Building capacity</p>
<p><b>Collaborators:</b> Implementation in research settings is supported by ongoing engagement with the VCGS, patient groups and research partners in clinics across 12 countries.</p>					
<p><b>Monitors:</b> The research team monitors use of, and interest in, the technique by clinicians and researchers. Feedback from patient groups about the community information website is also recorded.</p>					
<p><b>Enablers:</b> Key relationships which supported translation and impact goals included patient groups, research partners in clinics in 12 countries, and the VCGS.</p>					
<p><b>Barriers:</b> As genomic clinical testing is such a new area of research, the team has faced novel issues relating to ethics, consent, data handling and costs, for example. In addition, much time has been spent raising awareness of the technique and educating doctors about the technology and when it should be used.</p>					

## Appendix C: Case study #3 – Take a breath

Lead campus researchers: Professor Vicki Anderson, Dr Frank Muscara, Dr Meredith Rayner

GOALS	INPUTS	PROCESSES	OUTPUTS	OUTCOMES	IMPACT
<p>Knowledge translation goals: To embed new approaches within the Children’s Cancer Centre.</p> <p>To encourage wide adoption of both the identification tool and intervention approach, including among parents of children in other illness groups and across other clinical settings.</p> <p>Research goal: To develop and implement both a tool to support clinicians in the Children’s Cancer Centre to identify parents in need of support, and interventions which support parents to improve their mental health, distress and stress.</p>	<p>Clinical expertise of RCH clinicians.</p> <p>Key relationships including with heads of relevant clinical units, social workers, psychologists, parents, and external experts such as the Parenting Research Centre, Dr Robyn Walser and Dr Anne Kazak.</p> <p>Financial support for translation was provided primarily by the RCHF, the Pratt Foundation and the Victorian Government.</p>	<p>Translation and impact goals were identified at the outset, in consultation with clinicians and other key stakeholders.</p> <p>Translation goals were not rigid, but were adjusted in response to ongoing communication and feedback from clinicians and consumers collected as part of monitoring the achievement of translation goals.</p> <p>‘Champions’ were identified from each clinical unit engaged in the process. In addition, a member of the research team took responsibility for translation activity, and was supported by leadership.</p> <p>Regular team supervision addressed translation and impact goals.</p>	<p>A framework was developed to guide planning for translation an impact.</p> <p>A therapeutic program was developed to assist parents to identify and manage their distress.</p> <p>An adapted version of the therapeutic program was developed for delivery via tablet-based video-conferencing from home.</p> <p>A tool for supporting clinicians to identify parental stress was developed.</p> <p>A database of families has been established.</p> <p>A training program, manual and protocol for the parents’ intervention has been developed, and a website and newsletter support ongoing engagement and communication.</p> <p>Publications in peer reviewed journals and conference presentations.</p>	<p>Pilot data has indicated that early identification of parental stress has enabled support to be offered in a timely manner to families who need it, thus fostering positive child outcomes.</p> <p>The therapeutic program has been shown by pilot and qualitative data to be effective over the long term.</p> <p>In response to evaluation data and feedback, the adapted version of the therapeutic program vastly increased participation rates, particularly among fathers.</p> <p>The tool for supporting clinicians to identify parental stress has been mandated for use among parents of childhood cancer patients across Victoria, and is being trialled among other patient groups such as by the Children’s Cancer Centre in Sydney.</p> <p>The parenting intervention has been introduced within the Victorian Paediatric Rehabilitation Service and incorporated into their service guidelines. The parenting intervention has also been taken up by numerous other hospitals and services, including internationally.</p> <p>Advocacy by the research team has raised awareness within Victorian government representatives about the importance of family wellbeing to child outcomes, and the research has influenced policy in other states and other countries.</p> <p>The online model developed for use by parents during the intervention has been emerged as a successful way of increasing access to health interventions, based on attendance data and qualitative feedback.</p> <p>Increased awareness of the potential this approach has to greatly increase access to health interventions across a range of conditions.</p> <p>Advanced knowledge of the applicability of these approaches for use in relation to a range of childhood conditions, illnesses and ages.</p> <p>A high degree of interest in the online aspects of the intervention.</p> <p>The database of families has supported further research in the field.</p> <p>The research program has improved the awareness and understanding of clinicians, and the skills of the research team in implementation science have been enhanced.</p>	<p>Health</p> <p>Informing decision making</p> <p>Social &amp; economic</p> <p>Advancing knowledge</p> <p>Building capacity</p>
<p><b>Collaborators:</b> Relationships with key stakeholders were established at the outset and maintained through regular meetings and communication, including with identified champions from other units. A newsletter for families supported ongoing engagement and communication.</p>					

## Appendix C: continued

GOALS	INPUTS	PROCESSES	OUTPUTS	OUTCOMES	IMPACT
	<p><b>Monitors:</b> Clinical data regarding uptake of the identification tool has indicated its success. Attendance data for the intervention was collected, as was ongoing feedback from clinical stakeholders, gathered via focus groups and surveys. Qualitative data were also collected as part of the intervention in the form of recordings of intervention sessions.</p>				
	<p><b>Enablers:</b> Clinical expertise of RCH clinicians, relationships with key stakeholders and financial support for translation. The flexibility to be responsive to ongoing communication and feedback from clinicians and consumers collected as part of monitoring the achievement of translation goals.</p>				
	<p><b>Barriers:</b> Level of engagement with the RCH psychology service.</p>				

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