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Getting from Knowledge to Action:

Effectively communicating Research & Development value to multiple Stakeholder Groups.

Joseph Lane & John Westbrook

RESNA - 2010

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Presenter Background

- ***Joe Lane, MBPA***
- ***Center for Assistive Technology; UB/SUNY***
- ***From RERC on Technology Transfer to Center on KT for TT***
- ***Stakeholder: Researcher; Broker; Consumer***
- ***John Westbrook, PhD***
- ***SEDL; Austin, TX***
- ***National Center for Dissemination of Disability Research***
- ***Shift from KDU to KT***
- ***Stakeholder: Researcher; Broker***

Historical Note

- ***Convergence of Science and Technology***
  - Technology, Medicine & Rehabilitation (Medical Model) → Federal Funding for Basic Research to generate repository of science-based knowledge.
- ***Convergence of Science and Society***
  - Empowerment & Independent Living (Social Model) → Federal Funding for Applied Research and Development to generate prototypes within Linear Model of innovation.

This workshop focuses on the latter – Science and Technology – and their link to Industry.

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Getting from Knowledge to Action

- ***Knowledge Translation - Definition***

How has KT been Defined in Disability Contexts?

From the NIDRR LRP 2005-2009

For NIDRR, the definition of Knowledge Translation (KT) refers to the multidimensional, active process of ensuring that new knowledge gained through the course of research ultimately improves the lives of people with disabilities, and furthers their participation in society.

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How has KT been Defined in Disability Contexts?

From the NIDRR LRP 2005-2009

The process is active, as it not only accumulates information, but it also filters the information for relevance and appropriateness, and recasts that information in language useful and accessible for the intended audience.

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How has KT been Defined in Disability Contexts?

From the NIDRR LRP 2005-2009

KT includes transfer of technology, particularly products and devices, from the research and development setting to the commercial marketplace to make possible widespread utilization of the products or devices.

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How has KT been Defined in Disability Contexts?

From the NIDRR LRP 2005-2009

Knowledge translation is a process of ensuring that new knowledge and products gained through research and development will ultimately be used to improve the lives of individuals with disabilities and further their participation in society.

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How has KT been Defined in Disability Contexts?

From the NIDRR LRP 2005-2009

Knowledge translation is built upon and sustained by ongoing interactions, partnerships, and collaborations among various stakeholders, including researchers, practitioners, policy-makers, persons with disabilities, and others, in the production and use of such knowledge and products.

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How has KT been Defined in Disability Contexts?

From the NIDRR LRP 2005-2009

The collaborative and systematic review, assessment, identification, aggregation, and practical application of high-quality disability and rehabilitation research by key stakeholders (i.e., consumers, researchers, practitioners, and policymakers) for the purpose of improving the lives of individuals with disabilities.

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Knowledge Translation What is it Exactly?

- *Is it new? Is it different?*
  - Began to be used in NIDRR community in the Long Range Plan of 2005-2009
  - Is it substitute language for “dissemination and utilization”?

Knowledge Translation - What is it Exactly? (continued)

- *KT encompasses all steps between the creation of knowledge and its application.*
- *KT is not a linear process*
- *KT initiates from research knowledge that may appropriately be added to by expert practitioner and professional opinion, and expert consumer opinion*

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Confusing Terminology

- knowledge transfer
- knowledge to action
- knowledge dissemination
- knowledge utilization
- knowledge mobilization
- research utilization
- evidence based practices
- evidence based guidelines
- evidence based outcomes

KT is a Process

- As a process, changes are expected – in our case we do expect the “K” (knowledge) to change and we expect the “T” (translation) to change, with different audiences and intended types of impact

- Changes are prompted by: increased knowledge, changing needs/questions, changes in the user groups, changes in the environment (e.g., recession)

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So What are Key Characteristics of KT

- Knowledge is connected to research
- Actively connected to user/beneficiary group(s)
- Inclusive of all activities from generation of new knowledge to its use
- KT helps identify what we know and what we don’t know – useful in planning future research

So What are Key Characteristics of KT (continued)

- Applies knowledge from research to solve/address practical issues or problems
- KT encourages the interaction of knowledge creators (researchers, experts, and others) with knowledge users/beneficiaries (consumers, policymakers, and others); Participatory Action Research concepts and KT are very compatible
- KT aggregates knowledge combining old concepts with new concepts in order to try and define “what we know”

So What are Key Characteristics of KT (continued)

- KT includes all the steps from the creation of knowledge to its application
- KT requires ongoing communication and collaboration between knowledge producers and knowledge users
- KT initiates by establishing a specific question and context for answering that question – tied to a specific sample and a specific context for application
- Effective KT is interdisciplinary and multi-modal

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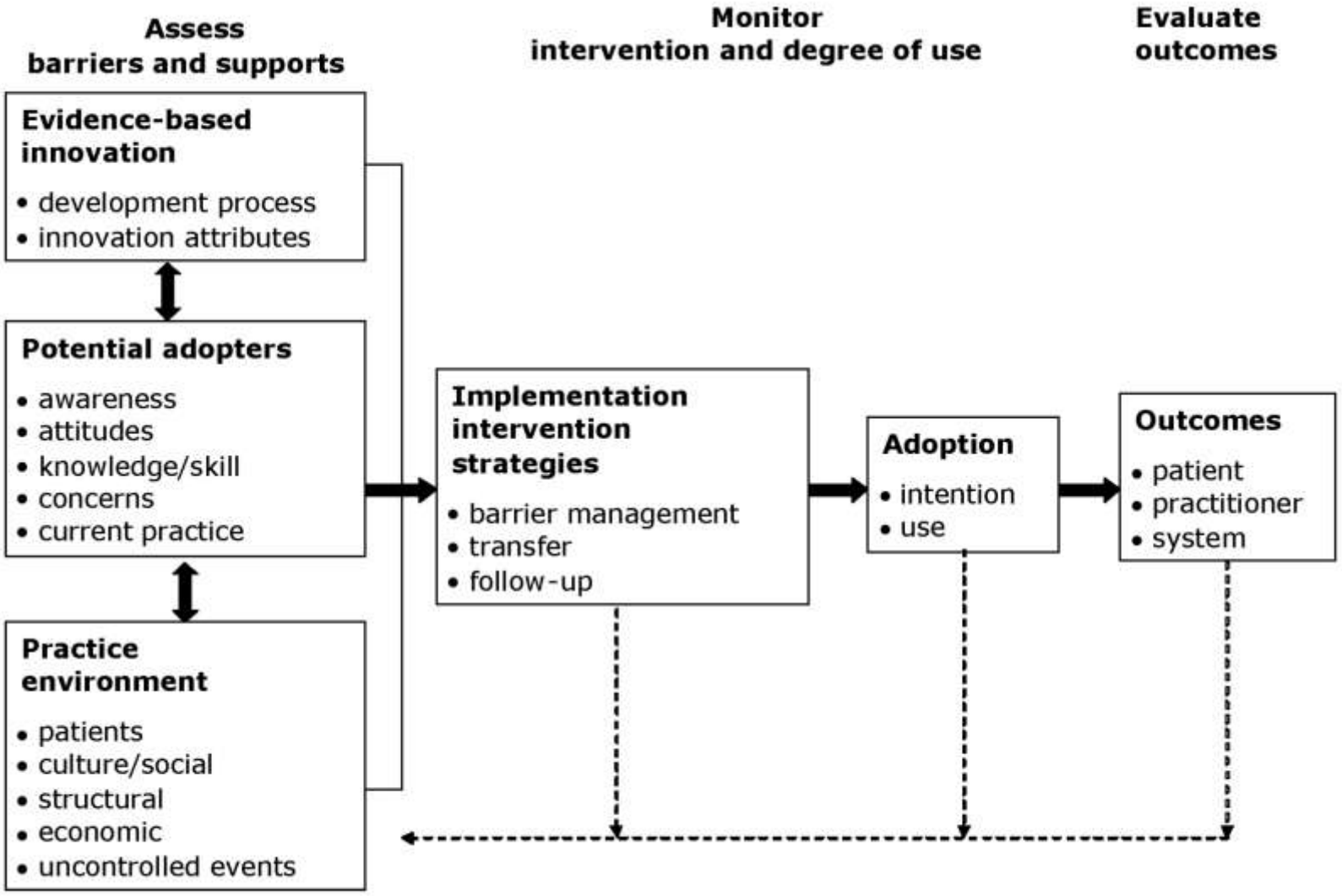
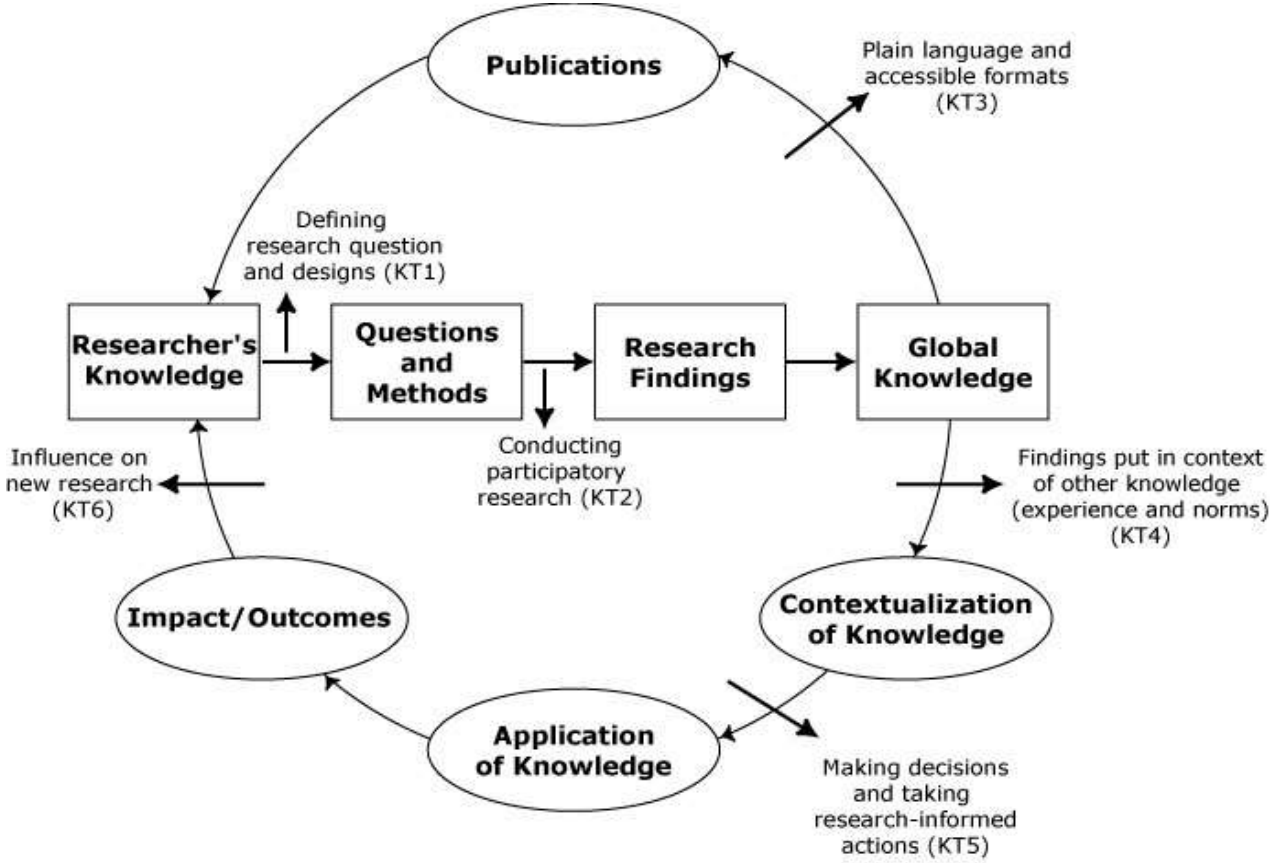
The Revised Ottawa Model of Research Use (Graham & Logan 2004)



- ***Canadian Institutes of Health Research (CIHR) Model of KT***



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Limitation of KT Models

- *All KT Models currently focus on "knowledge" as an output from scientific research.*
- *RESNA activity also address technology-based development and device production.*
- *RESNA represents stakeholders beyond researchers.*

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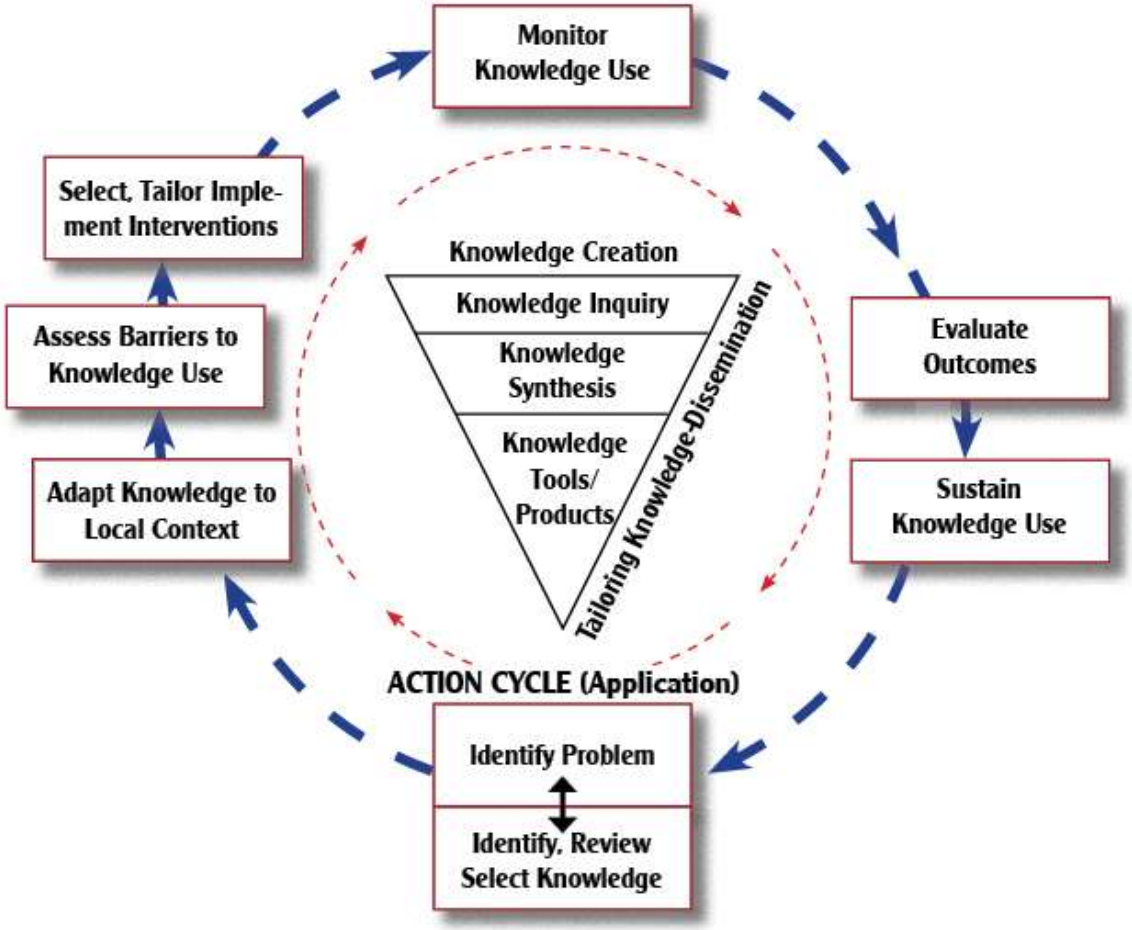
KTA Model - CIHR



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KTA Model - CIHR

- ***Knowledge to Action (KTA) Model addresses both creation of knowledge (funnel) and its application for multiple stakeholders (cycle).***
- ***KTA Model offers flexibility to adapt for both development and production activity.***

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Current Challenge: Moving Technology-based knowledge into action requires a broader framework.

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RESNA's Stakeholders in Workshop?

- ***Researchers (Scientists & Engineers)?***
- ***Clinicians (Therapists/Educators/Counselors)?***
- ***Consumers (PWD's & Family Members)?***
- ***Manufacturers (OEM & VAR)?***
- ***Policy Makers (government/agency)?***
- ***Brokers (attorneys/consultants)?***

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Three different but related methods transform knowledge into three difference but related states, involving all stakeholders as both knowledge producers and as knowledge consumers.

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3 Methods = 3 States

- *Research methods generate knowledge in state of conceptual discoveries.*
- *Development methods generate knowledge in state of tangible proof-of-concept prototypes.*
- *Production methods generate knowledge in state of market-ready devices or service innovations.*

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Discovery State of Knowledge

- Research ⇒ Knowledge Creation.
- Process - New knowledge discovery results from empirical exploration.
- Value – Novelty in first articulation and contribution to knowledge base.
- Output – Conceptual idea embodied as publication.

Invention State of Knowledge

- Development ⟹ Knowledge Application.
- Process - Invention results from trial and error experimentation.
- Value – Novelty + Feasibility embodied proof of concept.
- Output – Embodied as tangible proof-of concept prototype.

Innovation State of Knowledge

- Production ⇒ Knowledge Codification.
- Process – Innovation results from systematic specification of attributes.
- Value – Novelty and Feasibility + Utility to producers and consumers.
- Output – Embodied as functional device or service.

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Trajectories linked between Research, Development & Production Domains

Research ⟶ *Discovery* ⟶Translation ⟶ Utilization

Development⟶ *Prototype*⟶ Transfer⟶ Integration

*** ***

Production ⟶ *Innovation* ⟶ Release ⟶ Life Cycle

“R is not D; R about D is not D” - E. Linsenmeyer, FLC

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Evidence Milestones	Research Discovery	Development Invention	Production Innovation
Identify Opportunity	Knowledge gap in literature	Supply Push or Demand Pull	Feature/function gap in device or service
Establish Scope	Volume of topic discussion in lit	Inventor described or Analysis defined	Statement of need by Users or Vendors
Propose Solution	Experimental Hypothesis	Champion's vision or Stakeholder defined	Value Proposition
Validate Originality	Literature Review	Assumed or State of Market Survey	Prior Art and State of Practice Search
Conduct Process	Scientific Method – Control variables for objective results	Experimental Method – manipulate variables for subjective results	Product method – optimize function within constraints
Conclude Results	Discovery noted	Innovation noted	Product Specified
Internal Delivery of Output	**Scholarly manuscript**	**Proof of Concept Prototype**	**Market Ready Good or Service**

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Progression through all three states is necessary to generate technology-based innovations for society.

The passive "Linear Model of Innovation" is discredited, yet there are no operational active models – until now!

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"Translating Three States of Knowledge: Discovery, Invention & Innovation"

Lane & Flagg (2010)
Implementation Science

http://www.implementationscience.com/content/5/1/9

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Need to Knowledge (NtK) Model

- Based on CIHR KTA Model.
- Technology-based efforts intending impact MUST begin with a validated problem (need) and a feasible solution.
- Actors “need to know” stakeholders and context prior to initiating any project.
- Solution integrate Discovery, Invention and Innovation outputs.

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Phases	Stages and Gates
Discovery (Research)	Stage 1: Define Problem & Solution
	Stage 2: Scoping
	Stage 3: Conduct Research and Generate Discoveries – Discovery Output
Prototype (Development)	KTA – Knowledge in Discovery State
	Stage 4: Build Business Case and Plan for Development
	Stage 5: Implement Development Plan
	Stage 6: Testing and Validation – Invention Output
Innovation (Production)	KTA – Knowledge in Invention State (Proprietary & Non-Proprietary)
	Stage 7: Plan and for Production
	Stage 8: Launch Device or Service – Innovation Output
	KTA – Knowledge in Innovation State (Sales & Marketing)
	Stage 9: Life-Cycle Review / Terminate?

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Need to Knowledge (NtK) Model

- Model shows Phases, Stages, Steps, Tasks and Tips.
- Supported by primary/secondary findings from a scoping review of 250+ research and practice articles.
- ***http://kt4tt.buffalo.edu/knowledgebase/model.php***

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NOTE:

- ***John – at this point I'd like to move to web-based Model to show and talk through the three different KTA models, as well as to review the three Stakeholder tables associated with each one. This would form the focus of the talk's point of targeting the message to the intended audience.***
- ***Then back to wrap up slide at end of talk.***

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Key Points:

- ***We have an operational model for the Innovation Process validated by research and practice literature.***
- **Recognizing knowledge in three states has implications for policy, practice and for communication.**
- ***Effective communication requires:***
  - **Knowing Knowledge State;**
  - **Tailoring Message to Target Stakeholder.**

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