

# SUPPORT AKI

Strategy for UPtake of PrOcesses for Recognizing and Responding To Acute Kidney Injury

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UNIVERSITY OF ALBERTA  
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# Overview: Why, What & How?

- **Why** is it important to recognize and manage AKI early?
- **What** will be done as part of the initiative?
- **How** will it be implemented?
- Questions and next steps

# Why?: AKI, hospitalization, and costs in Alberta

## Methods



**Alberta**

Nov, 2002 to April, 2009  
239,906 hospitalized adults



baseline Cr determined prior to admission



AKI:  
AKIN-determined by peak Cr



Recovery:  
determined by Cr after D/C

## Results

		N	hospital mortality	one year mortality	length of stay	hospital cost
	No AKI	206,650 (86%)	3%	12%	8.9 days	\$9,444 CAD
↕	Stage 1	25,495 (11%)	12%	25%	11.4 days	\$12,356 CAD
	Stage 2	4,598 (2%)	27%	41%	12.8 days	\$14,370 CAD
↕	Stage 3	2,493 (1%)	34%	47%	13.7 days	\$14,822 CAD
	Stage 3 + Dialysis	670 (0.3%)	50%	56%	16.5 days	\$24,260 CAD

**Conclusion** Severity of AKI, need for dialysis, and lack of kidney recovery are associated with significant health care costs in hospitalized patients and persist a year following admission.

David Collister, Neesh Pannu, Feng Ye, Matthew James, Brenda Hemmelgarn, Betty Chui, Braden Manns, Scott Klarenbach. Healthcare Costs Associated with Acute Kidney Injury, CJASN doi:10.2215/CJN.00950117.

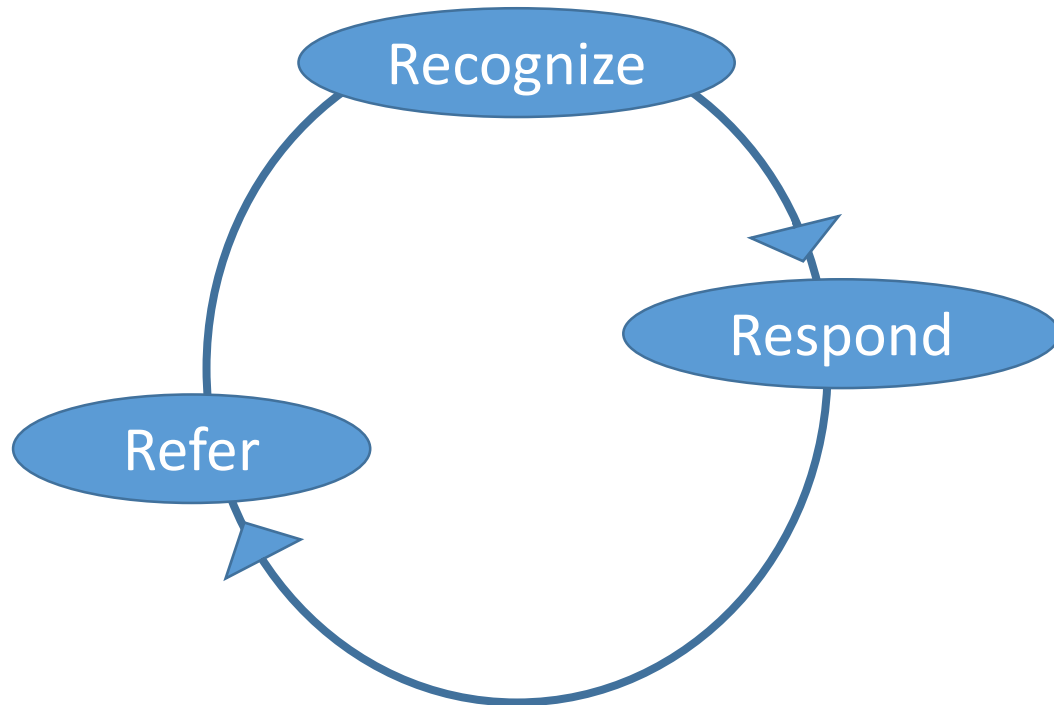
# Why?: The Clinical Challenge

## **Early intervention begins with early recognition**

- Symptoms may be absent at early stage
- Possible warning sign (not always): reduced urine production
- Quick deterioration with sudden symptoms:
  - nausea, vomiting, confusion, edema, low/high blood pressure
- **Prompt intervention → Reversible and Resolves rapidly**
  - Fluid balancing and medication adjustment

**Renal function continues to decline, unless AKI is recognized and treated**

# What?: The SUPPORT AKI Initiative



## Recognize

- Recognize AKI at its onset and factors contributing to progression

## Respond

- Continue to monitor and record the relevant parameters (i.e. serum creatinine, urine output) to support interventions

## Refer

- Relay information to care team (i.e. pharmacist, physician) to initiate early intervention

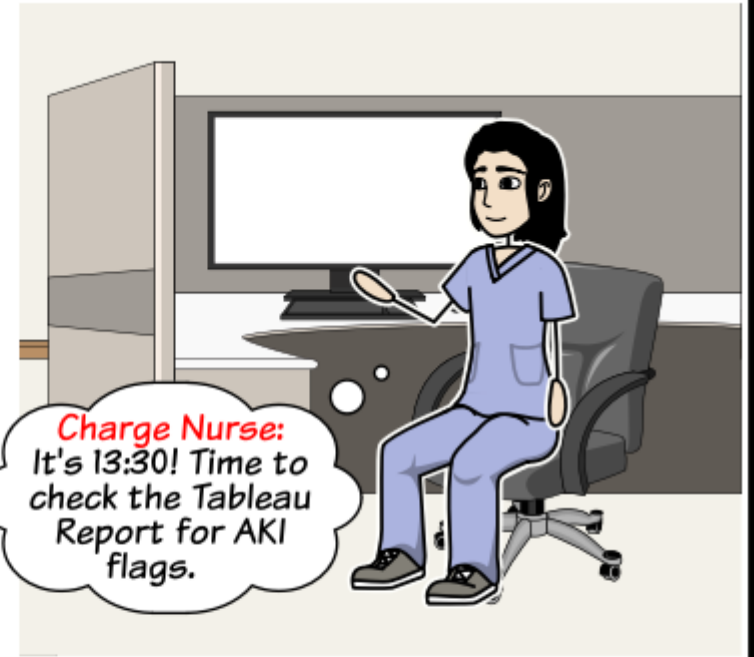
**Outcome:** Reverse injury, Reduce avoidable harm, Restore renal function

# How?: The SUPPORT AKI Initiative



**Charge Nurse:**  
I need to review  
lab result.

**RECOGNIZE:** CN reviews lab results daily to identify patients with AKI



**RECOGNIZE:** CN pulls tableau report daily at 13:30. Tableau flags AKI episodes approx. 24 hrs after lab results become available.

# How?: The SUPPORT AKI Initiative

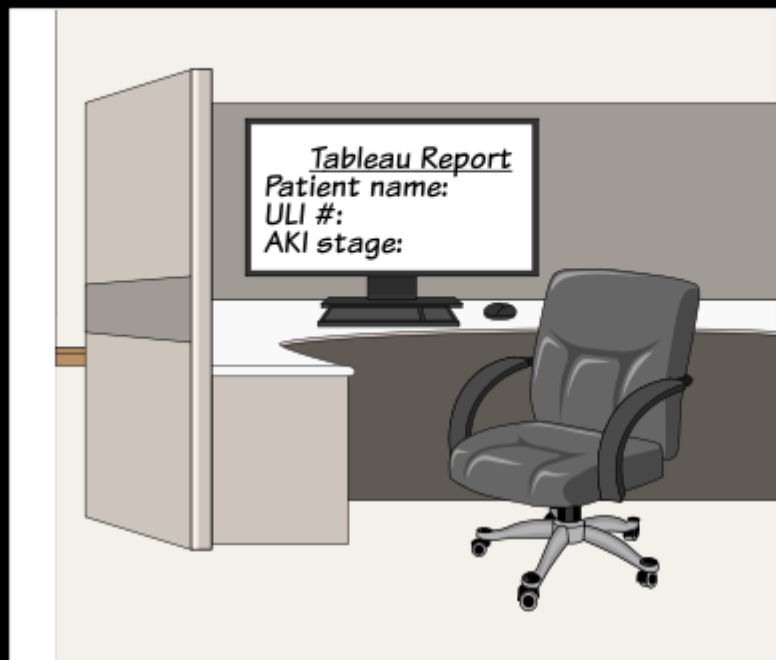
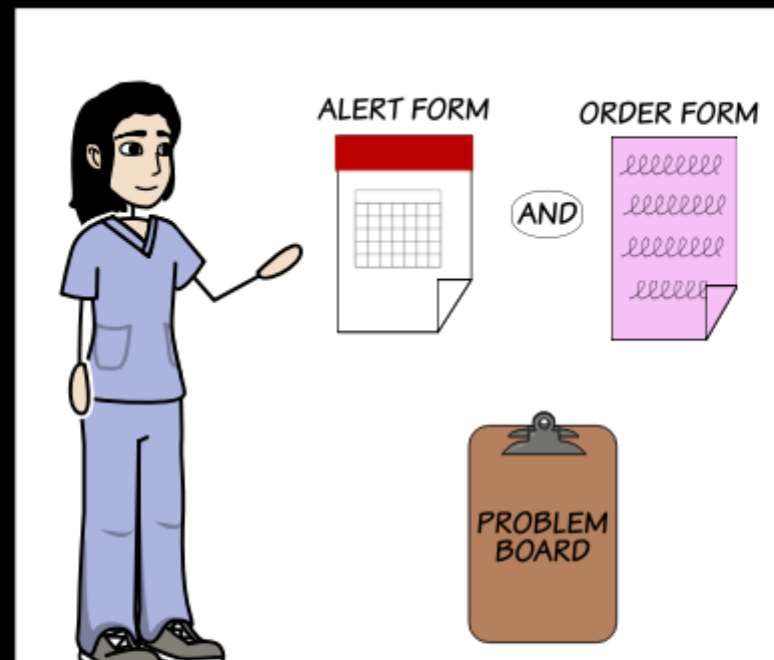
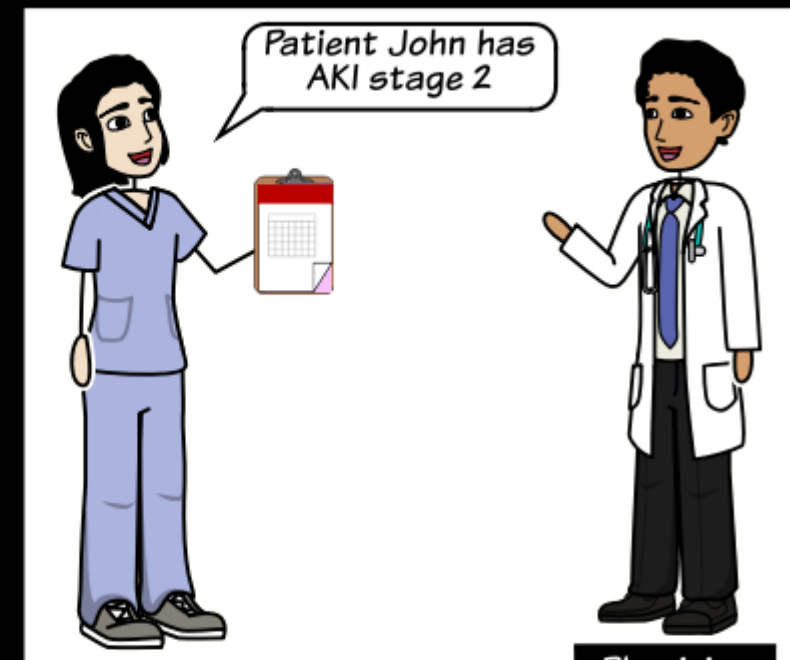


Tableau Report displays patient information and AKI stage. Turn this page for more information on AKI staging.



**RESPOND:** To alert physician, place a completed AKI alert form and Physician order form on problem board. Add information to Kardex




**REFER** to physician. Where available, residents and extenders may be contacted first.

# How?: The SUPPORT AKI Initiative

## Alert Form

AKI Alert Form				
<b>AKI Stage:</b> <i>(Please insert from Tableau Report)</i>	<b>Patient Label</b>			
<b>Baseline serum creatinine:</b> <i>(Review chart)</i>				
<b>Date of Surgery:</b>				
<b>Is this a dialysis patient?</b> Yes    No				
<b>Please monitor and record</b>				
<b>Date</b> (from the date patient was flagged)				
<b>Serum Creatinine</b> ( $\mu\text{mol/L}$ )				
<b>24hr Urine Output</b> (ml)				
<b>Normal Serum Creatinine:</b> <i>Females: 50-90 <math>\mu\text{mol/L}</math> Males: 70-120 <math>\mu\text{mol/L}</math></i>	<b>Normal Urine Output:</b> <i>800 -2000 ml in 24 hrs</i>			
<b>To flag patients:</b>				
<ul style="list-style-type: none"><li>• Please insert AKI stage and attach patient label to this <b>ALERT FORM</b></li><li>• Attach an <b>AKI ORDER FORM</b> to the <b>ALERT FORM</b></li><li>• Place them on the <b>PROBLEM BOARD</b></li></ul>				
Paged physician at _____ Time _____ Date _____				

## Order set

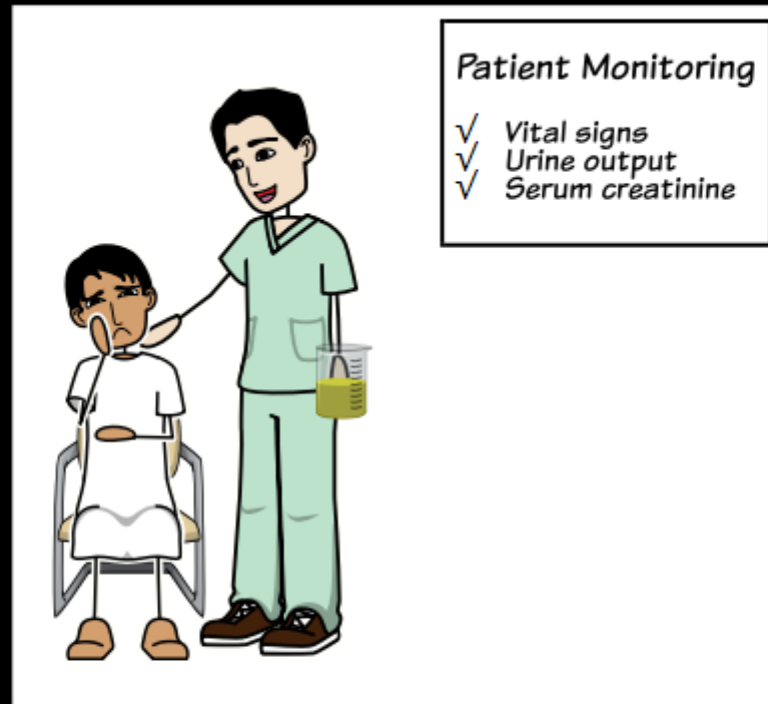
 <b>Alberta Health Services</b>	Last Name	
	First Name	
	PHN#	MRN#
	Birthdate ( <i>dd-Mon-yyyy</i> )	Physician
<b>Acute Kidney Injury, Adult Inpatient Orders</b>		
Select orders by placing a (✓) in the associated box		
For more information, see Clinical Knowledge Topic <b>Acute Kidney Injury, Adult – Inpatient</b> <a href="http://insite.albertahealthservices.ca/14163.asp">http://insite.albertahealthservices.ca/14163.asp</a>		
<b>Diet</b>		
<input type="checkbox"/> Regular		
<input type="checkbox"/> Renal – hemodialysis		
<input type="checkbox"/> Renal – no dialysis		
<i>For patients with/at risk of hyperkalemia</i>		
<input type="checkbox"/> Low potassium – adult		
<i>For patients with volume overload</i>		
<input type="checkbox"/> Low sodium 2000 mg – adult		
<i>For hypovolemic / potentially volume responsive patients</i>		
<input type="checkbox"/> Clinical Communication - Encourage fluid intake		
<i>For volume overloaded patients</i>		
<input type="checkbox"/> Fluid Restriction - Restrict PO fluid intake _____ mL/Day		



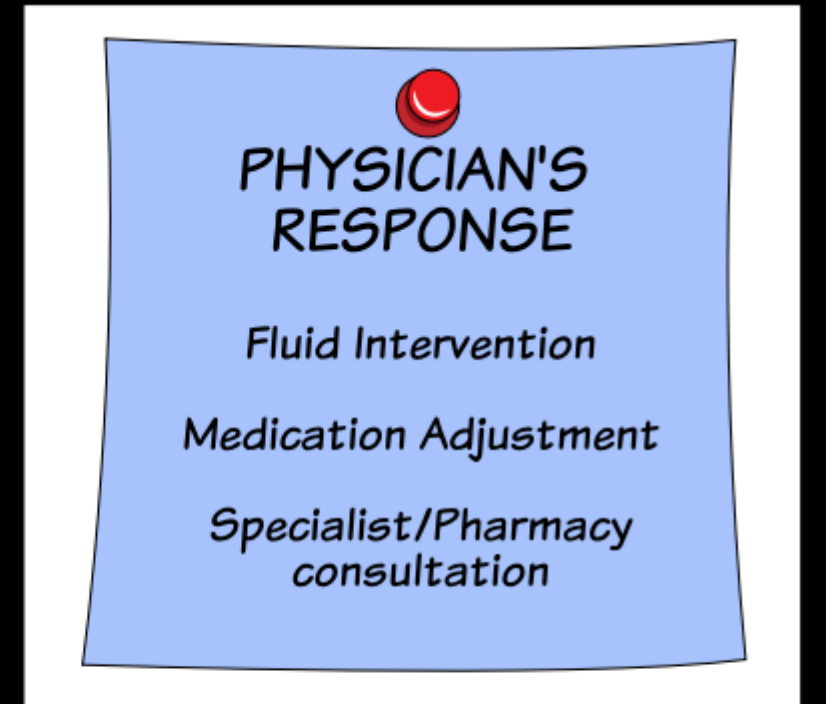
# How?: The SUPPORT AKI Initiative



**REFER** to pharmacist. Full review available to vascular patients. For others call dispensary, Pharmacy Intervention Note may be created.




**RESPOND:** Primary nurse continues to monitor and record urine output and SCr on AKI alert form. Follow up with physician on PIN.



AKI severity will guide the urgency of referrals.

# How?: The SUPPORT AKI Initiative

## Pharmacy Intervention Note

	SIGNATURE:		
NOTE CHANGES ON ALL RECORDS FASTEN TO DOCTOR'S ORDER SHEET	 <b>-PHARMACY INTERVENTION NOTE-</b>		
	DATE	PATIENT:	UNIT / ROOM #:
	TIME:	ID#:	
	DOCTOR'S ORDER READS:		
	PLEASE NOTE THE FOLLOWING: <input type="checkbox"/> ADAPTED PRESCRIPTION <input type="checkbox"/> THERAPEUTIC INTERCHANGE <input type="checkbox"/> CHANGE <input type="checkbox"/> CLARIFICATION <input checked="" type="checkbox"/> INFORMATION Patient is on the following medication(s) that may affect renal function and/or are renally cleared:  Please contact prescriber to assess the adjustment of doses and/or discontinuation of the listed medication(s).		
	SIGNATURE:		

# How?: The SUPPORT AKI Initiative

## Medications to be avoided or dose adjusted\*

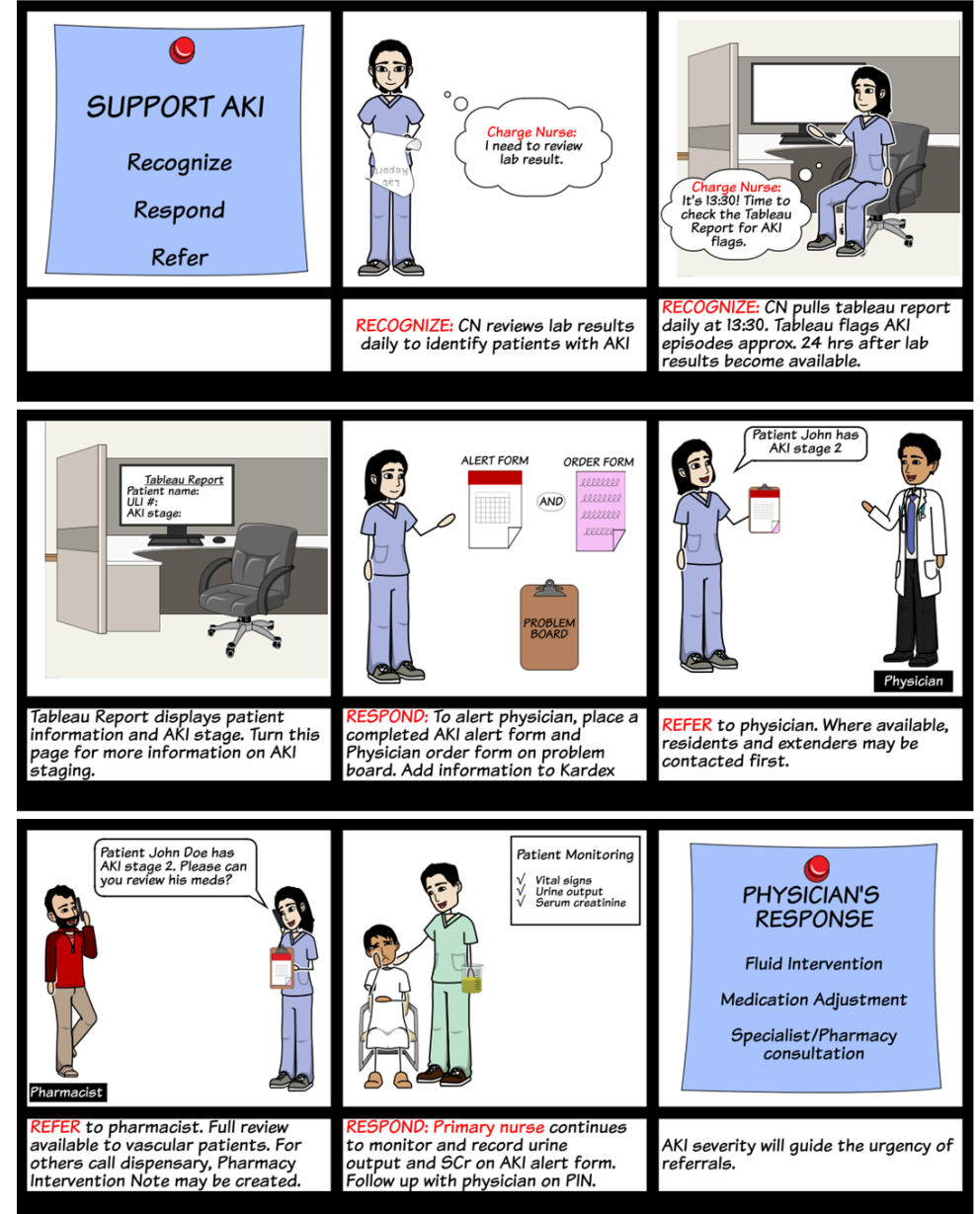
- **Diuretics** (e.g. Lasix, spironolactone, amiloride, hydrochlorothiazide, chlorthalidone, indapamide)
- **NSAIDs** (e.g. Ketoralac, Naproxen, Indomethacin, Ibuprofen)
- **ACEi** (e.g. Perindopril, Lisinopril, Ramipril, Captopril, Enalapril)
- **ARBs** (e.g. Telmisartan, Irbesartan, Valsartan, Candesartan, Losartan, Olmesartan)
- **CNIs** (e.g. Tacrolimus, Cyclosporine)
- **Anti-infectives** (e.g. Ciclovir, Aminoglycosides, Amphotericin IV Fungizone<sup>®</sup>, Co-trimoxazole, Fluconazole, Ganciclovir IV, Penicillins, Teicoplanin, Tetracycline, Trimethoprim, Valganciclovir, Vancomycin)

\* Bring to the attention of physician

This is not exhaustive, full list of high risk medication is on AHS Insite, check the **Clinical knowledge Topic on Acute Kidney Injury.**

# How?: The SUPPORT AKI Initiative

## Job aid



# Resources: The SUPPORT AKI Initiative

## AHS Clinical Knowledge Topic:

- Refer to AHS Clinical Knowledge Topic on Acute Kidney Injury for further guidance of management, including need for consultation with specialists

<http://insite.albertahealthservices.ca/assets/klin /et-klink-ckv-acute-kidney-injury-adult-inpatient.pdf>



# When?: The SUPPORT AKI Initiative



**September 10, 2018**

# Contact us:



## Study inquiries or feedback about the tools and processes?

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