How to disseminate the Acute Care for Elders (ACE) model of care beyond one unit

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Disclosure

- No competing interests in regards to the content of this presentation.

Objectives

Upon completion, you will be able to:

- List the principles and benefits of the ACE model of care.
- List the requirements of disseminating ACE beyond one unit.
- Describe how innovation, process reengineering, and effective communication can help ACE dissemination.

SPECIAL ARTICLES

A RANDOMIZED TRIAL OF CARE IN A HOSPITAL MEDICAL UNIT ESPECIALLY DESIGNED TO IMPROVE THE FUNCTIONAL OUTCOMES OF ACUTELY ILL OLDER PATIENTS

C. SETH LANDEFELD, M.D., ROBERT M. PALMER, M.D., DENISE M. KRESEVIC, M.S.N., RICHARD H. FORTINSKY, PH.D., AND JEROME KOWAL, M.D.

Principles of ACE model of care:

- Patient-centered care.
- Frequent medical review.
- Prepared environment.
- Early rehabilitation.
- Enhanced discharge planning.

N Engl J Med 1995; 332:1338–1344.

BMJ

RESEARCH

Effectiveness of acute geriatric units on functional decline, living at home, and case fatality among older patients admitted to hospital for acute medical disorders: meta-analysis

Juan J Baztán, consultant geriatrician,[1] Francisco M Suárez-García, geriatrician,[2] Jesús López-Arrieta, consultant geriatrician,[3] Leocadio Rodríguez-Mañas, chief of department,[4] Fernando Rodríguez-Artalejo, professor of preventive medicine and public health[5,6]

Wong 2006[w9] (teaching hospital, Canada)	Prospective controlled trial (Van Tulder 11), medical patients aged 75 or more. Excluded: critical care, palliative care, post-anaesthetic recovery. Patients placed in acute geriatric unit if bed available, usual care wards had six stroke beds

BMJ 2009; 338: b50.

ACE is Effective & Cost-effective

Effectiveness of Acute Geriatric Unit Care Using Acute Care for Elders Components: A Systematic Review and Meta-Analysis

Mary T. Fox, PhD, Malini Persaud, PhD,* Ilo Maimets, MSc, MISt,† Kelly O'Brien, PhD,‡ Dina Brooks, PhD,‡ Deborah Tregunno, PhD,* and Ellen Schraa, PhD§*

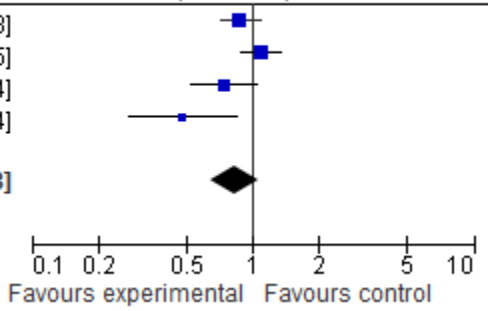
J Am Geriatr Soc 2012; 60: 2237–2245.

ACE Reduces Functional Decline

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Risk Ratio M-H, Random, 95% CI
Barnes 2012	141	858	145	774	31.3%	0.88 [0.71, 1.08]
Counsell 2000	147	746	133	736	31.3%	1.09 [0.88, 1.35]
Landefeld 1995	48	303	64	300	23.6%	0.74 [0.53, 1.04]
Zelada 2009	13	68	30	75	13.8%	0.48 [0.27, 0.84]
Total (95% CI)		**1975**		**1885**	**100.0%**	**0.83 [0.64, 1.08]**
Total events	349		372			

Heterogeneity: $Tau^2 = 0.04$; $Chi^2 = 9.34$, df = 3 (P = 0.03); $I^2 = 68\%$

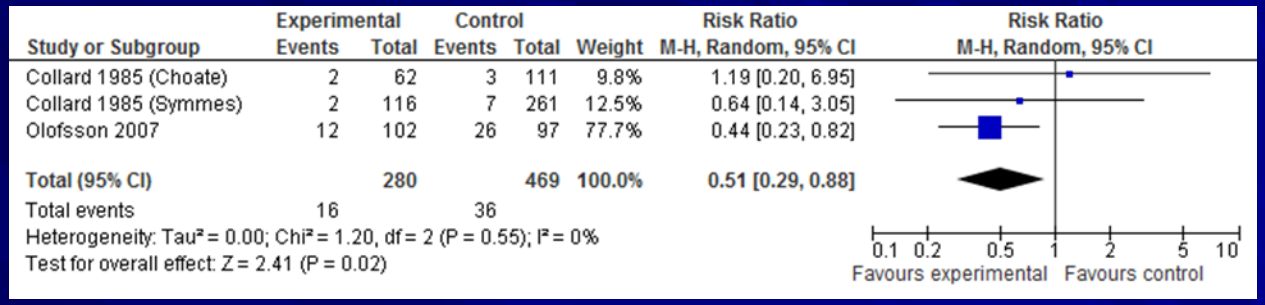
Test for overall effect: Z = 1.41 (P = 0.16)



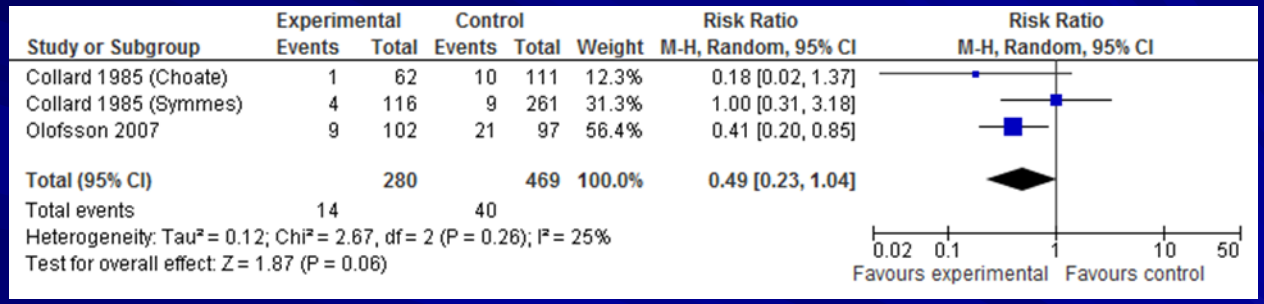
J Am Geriatr Soc 2012; 60: 2237–2245.

ACE Reduces Iatrogenesis

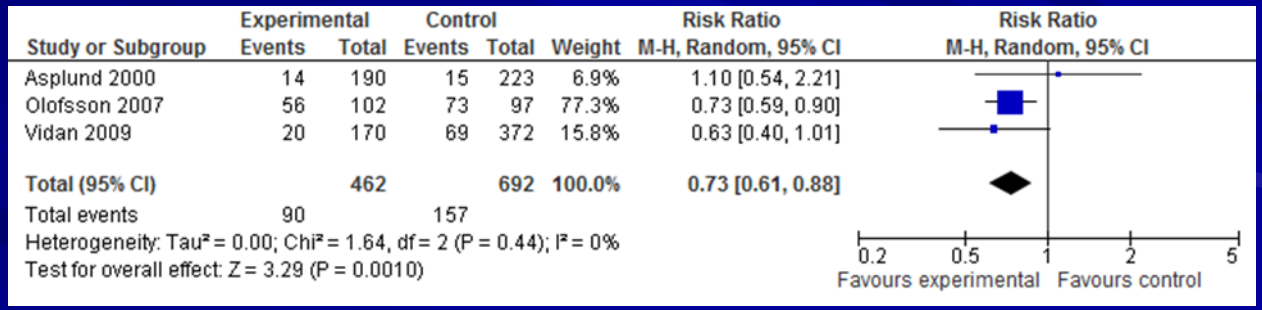
Falls



Pressure ulcers



Delirium



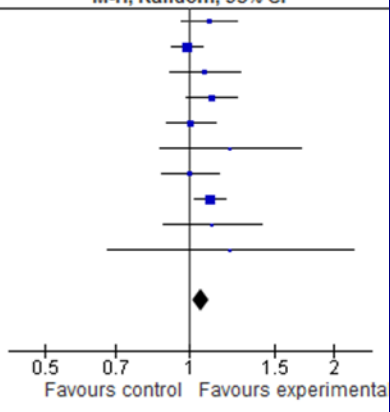
J Am Geriatr Soc 2012; 60: 2237–2245.

ACE Promotes Home Discharge

Home

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Risk Ratio M-H, Random, 95% CI
Asplund 2000	134	190	143	223	8.2%	1.10 [0.96, 1.26]
Barnes 2012	537	858	490	774	26.9%	0.99 [0.92, 1.07]
Collard 1985 (Choate)	66	95	136	211	5.4%	1.08 [0.91, 1.27]
Collard 1985 (Symmes)	96	123	204	291	10.4%	1.11 [0.99, 1.26]
Fretwell 1990	113	143	121	154	10.7%	1.01 [0.89, 1.13]
Gonzalez-Montalvo 2010	42	101	42	123	1.3%	1.22 [0.87, 1.71]
Harris 1991	75	97	131	170	8.1%	1.00 [0.88, 1.15]
Landefeld 1995	260	303	233	300	25.8%	1.10 [1.02, 1.19]
Olofsson 2007	48	64	37	55	2.8%	1.11 [0.88, 1.41]
Somme 2010	11	19	10	21	0.4%	1.22 [0.67, 2.19]
Total (95% CI)		**1993**		**2322**	**100.0%**	**1.05 [1.01, 1.10]**
Total events	1382		1547			

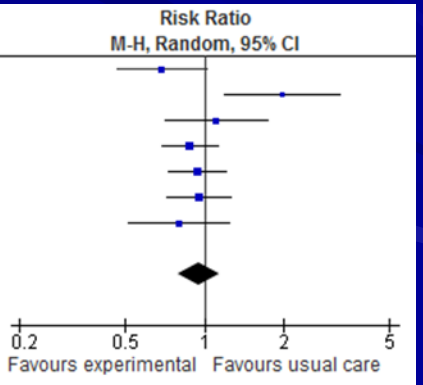
Heterogeneity: Tau² = 0.00; Chi² = 7.90, df = 9 (P = 0.54); I² = 0%
Test for overall effect: Z = 2.69 (P = 0.007)



LTC

Study or Subgroup	Experimental Events	Experimental Total	Control Events	Control Total	Weight	Risk Ratio M-H, Random, 95% CI
Asplund 2000	33	190	56	223	12.8%	0.69 [0.47, 1.02]
Collard 1985 (Choate)	23	95	26	211	9.0%	1.96 [1.18, 3.26]
Collard 1985 (Symmes)	23	123	49	291	10.6%	1.11 [0.71, 1.74]
Counsell 2000	99	660	119	700	19.5%	0.88 [0.69, 1.13]
Fretwell 1990	70	184	85	210	19.4%	0.94 [0.73, 1.20]
Gonzalez-Montalvo 2010	47	101	60	123	17.8%	0.95 [0.72, 1.26]
Harris 1991	22	97	48	170	10.9%	0.80 [0.52, 1.25]
Total (95% CI)		**1450**		**1928**	**100.0%**	**0.96 [0.80, 1.15]**
Total events	317		443			

Heterogeneity: Tau² = 0.03; Chi² = 11.90, df = 6 (P = 0.06); I² = 50%
Test for overall effect: Z = 0.48 (P = 0.63)

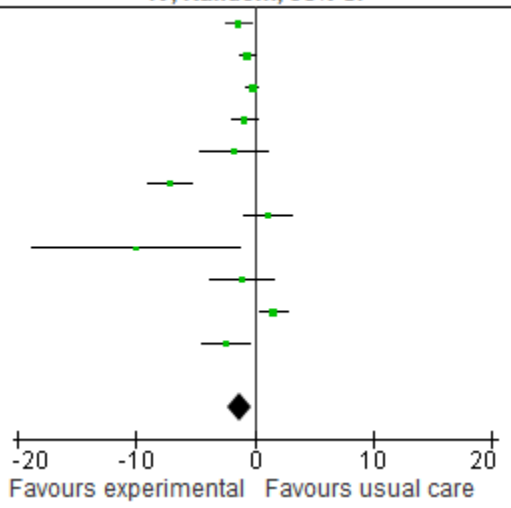


J Am Geriatr Soc 2012; 60: 2237–2245.

ACE Reduces Hospital LOS

Study or Subgroup	Experimental Mean	SD	Total	Control Mean	SD	Total	Weight	Mean Difference IV, Random, 95% CI
Asplund 2000	5.9	5.65	190	7.3	5.71	223	11.3%	-1.40 [-2.50, -0.30]
Barnes 2012	6.72	6.2	858	7.3	6.43	774	12.3%	-0.58 [-1.19, 0.03]
Counsell 2000	6.15	4.7	767	6.34	5.36	764	12.5%	-0.19 [-0.70, 0.32]
Covinsky 1997	7.53	6.1	326	8.42	7.74	324	11.3%	-0.89 [-1.96, 0.18]
Fretwell 1990	12.9	12.9	221	14.7	17.4	215	6.6%	-1.80 [-4.68, 1.08]
Gonzalez-Montalvo 2010	12.09	3.57	101	19.24	9.79	123	9.2%	-7.15 [-9.01, -5.29]
Harris 1991	10.9	7.88	97	9.8	7.82	170	8.9%	1.10 [-0.86, 3.06]
Olofsson 2007	28	17.9	102	38	40.6	97	1.3%	-10.00 [-18.79, -1.21]
Stewart 1999	6	5.25	34	7.1	5.51	27	6.9%	-1.10 [-3.83, 1.63]
Vidan 2009	9.92	6	170	8.36	7.87	372	11.0%	1.56 [0.35, 2.77]
Zelada 2009	7.5	4.3	68	9.92	7.74	75	8.7%	-2.42 [-4.45, -0.39]
Total (95% CI)			**2934**			**3164**	**100.0%**	**-1.28 [-2.33, -0.22]**

Heterogeneity: Tau² = 2.26; Chi² = 75.74, df = 10 (P < 0.00001); I² = 87%
Test for overall effect: Z = 2.37 (P = 0.02)



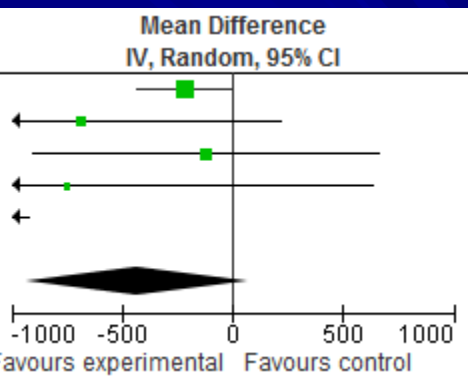
J Am Geriatr Soc 2012; 60: 2237–2245.

ACE Reduces Costs

Study or Subgroup	Experimental Mean	Experimental SD	Experimental Total	Control Mean	Control SD	Control Total	Weight	Mean Difference IV, Random, 95% CI
Asplund 2000	1,173	1,146	190	1,391	1,076	223	45.7%	-218.00 [-433.63, -2.37]
Barnes 2012	6,920	9,673	858	7,607	8,980	774	19.0%	-687.00 [-1592.07, 218.07]
Counsell 2000	6,017	7,193	767	6,139	8,327	764	22.6%	-122.00 [-901.60, 657.60]
Covinsky 1997	7,835	7,768	326	8,585	10,084	324	10.4%	-750.00 [-2134.44, 634.44]
Stewart 1999	6,766	4,850	34	10,918	7,390	27	2.3%	-4152.00 [-7381.19, -922.81]
Total (95% CI)			**2175**			**2112**	**100.0%**	**-431.37 [-933.15, 70.41]**

Heterogeneity: Tau² = 131449.13; Chi² = 7.18, df = 4 (P = 0.13); I² = 44%

Test for overall effect: Z = 1.68 (P = 0.09)



J Am Geriatr Soc 2012; 60: 2237–2245.

Adaptations of ACE

ACE model implemented in:

- ACE unit for dementia patients.
- ACE-style stroke unit.
- ACE-style orthopaedic geriatric unit.
- ACE-style cancer unit.

Int J Geriatr Psychiatry. 2008; 23(2): 215-219.
J Am Geriatr Soc. 2003; 51(11): 1660-1667.
Hip Int. 2010; 20(2): 229-235.
J Clin Oncol. 2006; 24(15): 2298-2303.

Disseminating ACE Beyond a Unit

- Resource requirement:
  - Equipment, staffing.
- Innovation:
  - ACE tracker tool, ACE pocket card.
- Process reengineering:
  - e-Geriatrician, ACE advisory team.
- Communication strategy.

Wong RY, Vollbrecht M, Pagel P. How to disseminate the ACE model of care beyond one unit. In Acute care for elders: a model for interdisciplinary care, Malone ML, Capezuti EA, Palmer RM Eds.; Springer Science: New York, USA, 2014; pp 117–129.

ACE Equipment, Tools, Supplies

- Equipment:
  - Wall clock and calendar, departure alarm system, handrail in hallway, gait belt, shower bench with hand-held shower head, low bed, bed/chair alarm, wheel-lock recliner, chair with arm and elevated seat, voice amplifier.
- Tools:
  - Geriatric Depression Scale, Confusion Assessment Method.
- Supplies:
  - Recreational supplies, adaptive utensil and cup, dry erase board.

Wong RY, Vollbrecht M, Pagel P. How to disseminate the ACE model of care beyond one unit. In Acute care for elders: a model for interdisciplinary care, Malone ML, Capezuti EA, Palmer RM Eds.; Springer Science: New York, USA, 2014; pp 117–129.

ACE Staffing

- Med Manager: Geriatrician
- PSM: 0.3 FTE.
- PCC: 1.0 FTE.
- CNS: 0.3 FTE.
- RN:
  - 4.0 FTE days (1:5.5),
  - 3.0 FTE nights (1:7.3).
- LPN: 1.0 FTE.
- PCA: 2.0 FTE.
- PT: 1.0 FTE.
- OT: 1.0 FTE.
- Rehab assistant: 0.5 FTE.
- SW: 0.5 FTE.
- Dietitian: 0.7 FTE.
- Pharmacy: rotational.
- Spiritual care: rotational.
- CML: 1.0 FTE.
- Transitional service: rotational.

Levels calculated based on an ACE unit with 22 funded beds.

ACE Tracker Tool

- Computer-generated checklist of ACE patients from electronic medical record to identify those at risk for functional decline.
- Updated each day at midnight to display real-time data.
- Report can be available for every older patient on every unit of every hospital.
- Validated against in-person observation of patients.
- Interdisciplinary team can use ACE Tracker to review each patient's plan of care.

J Am Geriatr Soc. 2010; 58(1): 161-167.

Sample ACE Tracker Tool

Example of Printout from ACE Tracker summarizing risk factors for patients age 65 or older on a hospital unit.

Report Date: 01/26/2011 Report Time: 17:17

PATIENT ROOM/BED	AGE	LENGTH OF STAY	HISTORY OF DEMENTIA	CAM	NUMBER OF MEDS	BEERS	MORSE	HX OF FALLS	BED REST	PT	OT	RES	ADL	CATH	PRESS ULCER	WOUND CARE	BRADEN SCALE	ALBUMIN	SOCIAL SERVICES	ADVANCE DIRECTIVES	READMISSION RISK SCORE
Patient A	76	2	N	N	13	N	60	Y	N	Y	Y	N	8	Y	Y	Y	17	ND	Y	N	7
Patient B	74	1	Y	N	7	N	50	Y	Y	N	N	N	6	Y	Y	Y	9	2.9	N	Y	12
Patient C	78	12	Y	Y	10	Y	50	Y	N	Y	Y	N	7	N	N	Y	14	3.9	Y	Y	9
Patient D	72	1	N	N	5	N	50	N	N	N	N	N	12	N	N	N	15	ND	N	N	2
Patient E	91	6	Y	N	8	N	60*	N	N	Y	Y	N	6*	N	N	N	14	ND	Y	N	10
Patient F	78	1	N	N	7	N	70	Y	Y	N	N	N	6	Y	N	N	16	ND	N	N	5
Patient G	75	1	N	N	0	N	45	N	N	Y	Y	N	12	N	N	N	14	4.3	N	N	3
Patient H	93	1	Y	N	12	N	65	Y	N	Y	Y	N	6	N	N	N	15	ND	Y	Y	5
Patient I	91	1	Y	N	1	N	95	Y	N	Y	Y	N	7	N	N	N	12	3.5	N	Y	2
Patient J	74	5	N	N	20	N	45	Y	N	Y	Y	N	7	Y	Y	Y	12*	ND	Y	Y	12
Patient K	72	6	N	Y	14	N	20	N	N	Y	Y	N	8	N	N	N	17	3.2	Y	Y	4
Patient L	83	3	N	Y	12	N	80*	Y	Y	Y	Y	N	8	Y	N	N	12	2.3	N	Y	4
Patients Totals			5	3	11	1		8	3	9	9	0		5	3	4			6	7	

Legend: CAM: confusion assessment method; number of meds: number of medications; Beers: "Beers"high risk medications; Morse: Morse fall score; P/T: physical Therapy; O/T Occupational therapy; RES: restraints; ADL: activities of daily living; Cath: Urinary catheter;

ACE Pocket Card

- Pocket size laminated, education card that addresses geriatric syndromes (brief descriptions, risk factors, assessment methods, interventions).
- Distributed to ACE team and available online/intranet.
- Function as decision support for clinicians.
- Reminder to health professions of geriatric principles as they care for patients throughout the hospital.

Wong RY, Vollbrecht M, Pagel P. How to disseminate the ACE model of care beyond one unit. In Acute care for elders: a model for interdisciplinary care, Malone ML, Capezuti EA, Palmer RM Eds.; Springer Science: New York, USA, 2014; pp 117–129.

e-Geriatrician

- Regular consultation through teleconferencing between an off-site geriatrician (e-Geriatrician) and the local ACE team.
- The use of ACE Tracker and e-Geriatrician model improved urinary catheter use and physical therapy referrals.
- No change in ALOS, hospital readmission, use of physical restraint, high-risk medications, social work evaluation.

J Am Geriatr Soc. 2010; 58(1): 161-167.

ACE Advisory Team

- Comprises of nursing, social work, pharmacy, dietary, PT, OT, physician champion (and long term care liaison, patient representative).
- Role is to monitor the ACE program, identify needs for education, identify barrier, opportunity for improvement and expansion.
- Team also reviews data on the clinical site performance for selected ACE Tracker elements, re-admission rate, rate of new LTC placement, rate of home care referral, etc.
- Team can develop quality improvement (PDSA) strategy to address problem area.

Wong RY, Vollbrecht M, Pagel P. How to disseminate the ACE model of care beyond one unit. In Acute care for elders: a model for interdisciplinary care, Malone ML, Capezuti EA, Palmer RM Eds.; Springer Science: New York, USA, 2014; pp 117–129.

ACE Tracker Report Table

ACE TRACKER Analysis of Means Update (Most RECENT 6 Months)

July 12 - December 12

Hospital	A	B	C	D	E	F	G	H	I	J	K	L	M	
N for indicators 1 through 6 ⟶	1081	416	682	617	752	612	490	441	823	1975	6225	813	410	1 or More Significant Outliers? * (99% C.L.)
1. Beer's Medication Ordered (Care Process Metric)	10.4%	6.3%	9.1%	11.0%	8.9%	12.1%	7.8%	7.0%	7.0%	7.3%	9.8%	7.5%	6.8%	YES. AHC Avg. 8.5%
2. Beer's Medication Administered (Care Process Metric)	4.4%	2.9%	5.6%	3.7%	4.3%	2.8%	3.9%	3.6%	2.8%	3.0%	3.2%	4.3%	3.4%	NO. AHC Avg. 3.7%
3. Physical Therapy Consult (Care Process Metric)	56.5%	93.5%	68.2%	72.1%	90.4%	65.7%	90.4%	64.2%	80.7%	80.8%	67.6%	82.7%	78.5%	YES. AHC Avg. 72.7%
4. Restraints (Care Process Metric)	1.3%	1.4%	3.1%	4.7%	2.8%	0.8%	0.2%	0.9%	3.6%	2.9%	8.9%	2.5%	5.4%	YES. AHC Avg. 2.4%
5. Urinary Catheter (Care Process Metric)	26.6%	19.5%	22.7%	24.3%	20.5%	18.1%	28.8%	20.6%	13.2%	16.6%	21.8%	19.2%	18.3%	YES. AHC Avg. 20.9%
6. Social Services Consult/CM Review (Care Process Metric)	90.6%	85.6%	85.0%	84.6%	96.7%	87.3%	99.4%	89.6%	83.6%	81.2%	57.4%	87.3%	71.0%	YES. AHC Avg. 87.1%

GREEN Highlighted represent outliers from the overall Aurora Mean in the more desirable direction.
YELLOW Highlighted represent outliers from the overall Aurora Mean in the less desirable direction.

Green values - outliers from overall mean in more desirable direction.
Yellow values - outliers from overall mean in less desirable direction.

Mobile ACE (MACE)

- Mobile ACE (MACE) model has been proposed, and there is early evidence to suggest this model is associated with fewer adverse events, shorter hospital stay, and better patient satisfaction compared to usual care.
- There is also preliminary data to suggest the MACE model can produce comparable outcomes as the unit-based ACE model.

JAMA Intern Med. 2013; 173(11): 990-996.
Journal of Hospital Medicine. 2011; 6(6): 358-363.

Communication with Administration

- ACE model improves patient outcomes.
- ACE model is efficient.
- ACE model can be cost saving (at least cost neutral).
- ACE model can identify improvement opportunity in patient care.
- Success of ACE model requires capacity management.

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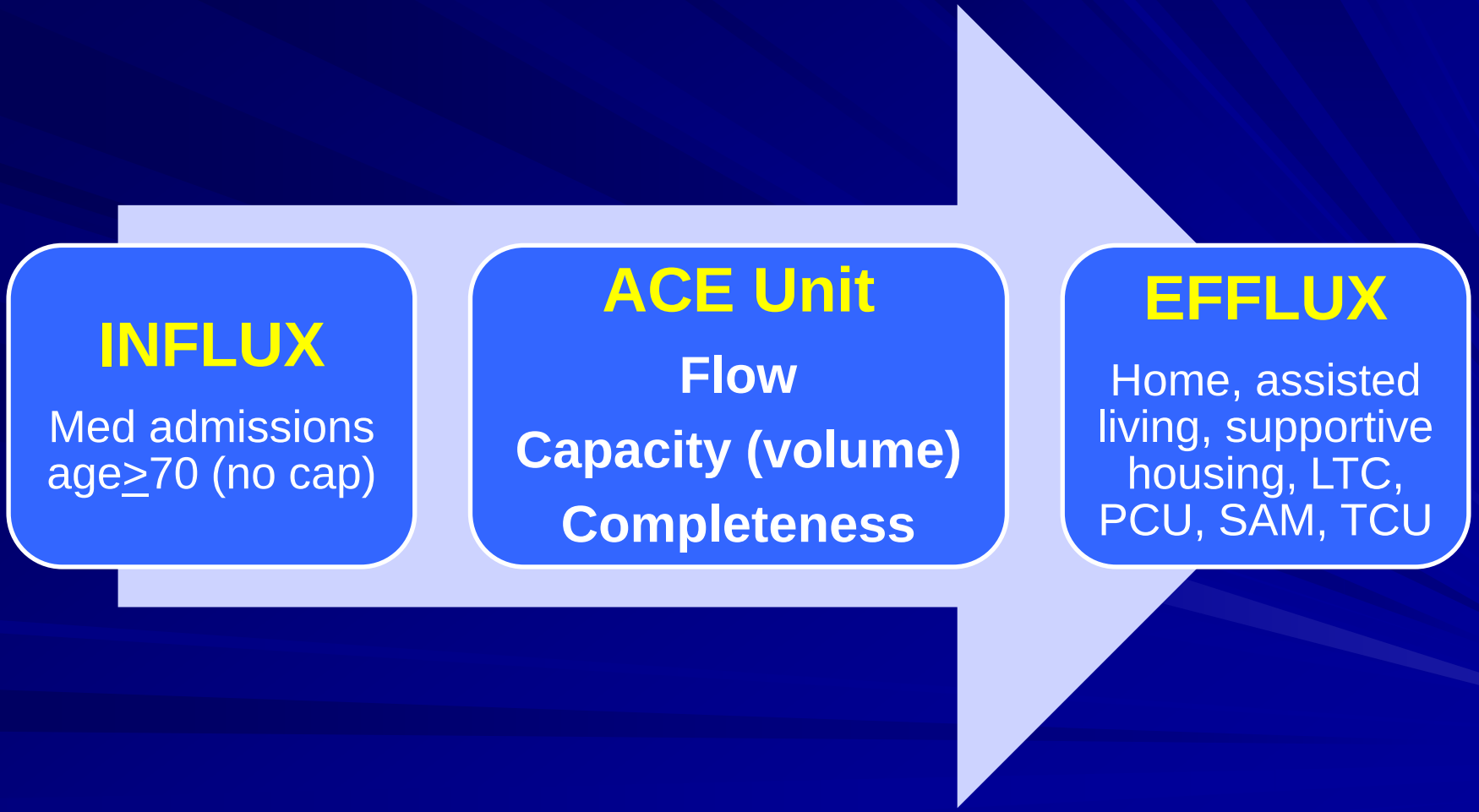
Patient Flowcharting In ACE



J of Can Geriatr Soc 2003; 6(3): 177-186.

Annual Utilization In ACE

	VGH ACE
Cases (indicator of capacity)	2638
Cases-CTU	1731 (66%)
Cases-FP	907 (34%)
ALOS (indicator of flow)	8.5 days
ALOS-CTU	7.6 days
ALOS-FP	10.3 days
Home Discharges	1588 (60%)
NH Discharges	583 (22%)
In hospital mortality	393 (15%)
Unplanned readmit (%)*	95 (4%)

Annual data from QUIST for fiscal period 2008-1 to 2008-13.
*Readmissions within 7 days with related diagnoses.

Relation of Flow and Capacity

Case Mix Group Plus (CMG+)	CMII Total Days Saved FY07P12 to FY08P13	% Change ALOS FY06 to FY08	Change in Case Volume FY06 to FY08	% Change Case Volume FY06 to FY08
Congestive heart failure	454		+62	
Pneumonia	503		+96	
Urinary tract infection	1,159		+46	
Chronic obstructive pulmonary disease	1,276		+66	
Gastrointestinal bleed	47		+52	
Total	**3,439**	**-21%**	**+322**	**+18%**

Annual data from QUIST for fiscal years 2006, 2007 and 2008.

ACE and Senior Friendly Hospital

- Goal: To transform acute care environment at large to a senior friendly hospital.
- Multiple improvements over time.
- ACE suitable venue to initiate and test changes.
- Develop small-scaled, evidence-based patient care practices that improve clinical care.
- Ensure relevance to the hospital, and possible extension and replication in other wards.

Summary

By now, you should be able to:

- List the principles and benefits of the ACE model of care.
- List the requirements of disseminating ACE beyond one unit.
- Describe how innovation, process reengineering, and effective communication can help ACE dissemination.